Effective Monitoring, Measurement and Control of Occupational Safety and Health Standards for Small Business General Contractors

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ABSTRACT

The purpose of this study was to delineate the critical components of an Occupational Safety and Health (OSH) management system for assisting Small Business General Contractors (SBGC) in controlling risk. SBGC face administrative challenges to effectively and efficiently monitor, measure and control OSH standards due to constraints on time and available resources. Goals for this study were established to define: a systems approach to managing OSH; critical tasks, responsible parties and required resources; management’s role; consequences of inadequate risk control. A review of relevant literature coupled with interviews involving construction industry safety professionals, gathered reliable data to ascertain the critical components of an OSH management system for a SBGC. The researcher was able to determine specific strategies for a SBGC to begin effectively and efficiently managing risk control. Clearly-defined, accountable roles and responsibilities united with active, visible and consistent participation at all levels within the organization is the
cornerstone to the success of an OSH management system for a SBGC. The results of this study were implemented into the operations of the SBGC used as the case study for this research.
ACKNOWLEDGMENTS

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Chapter I: Introduction

This research centers on Small Business General Contractors (SBGC) defined as a construction company employing 25 or less full-time employees. Wingra Construction, LLC is a SBGC with offices in Madison and Milwaukee, Wisconsin and is used as a case study for this research. Wingra, like many SBGC, set operational objectives toward Occupational Safety and Health (OSH) to the minimum expectations of federal and state compliance to control risk. For this research, risk shall be defined as exposure creating likelihood to incur immediate and/or sustained financial loss due to an OSH incident. Wingra’s OSH policy and procedures manual is compliance driven to meet federal and state regulations governing exposure present in the construction industry; it appears to be complete and accurate from a compliance perspective. The Occupational Health and Safety Administration’s (OSHA) 29CFR1926 Code of Federal Regulations for the construction industry was used as the primary point of reference for Wingra’s OSH program components.

This study’s focus is on SBGC who understand the value of OSH and the positive impact on productivity, operational efficiency, product quality and profitability potential but due to resource constraints are only able to provide for minimally equipped, compliance driven programs. This research seeks to examine what viable options are available for a SBGC beyond compliance driven curriculums. The purpose of this study focuses on how a SBGC can effectively and efficiently control risk while appreciating limited access to human, technological and economic assets. An effective OSH management system enables risk to be reduced to an organization’s established goals, while efficiency requires the desired result be achieved utilizing minimum resources, time and administrative effort.
The argument that compliance driven OSH programs are effective at controlling risk is shattered when viewing construction workplace injury rates. The construction industry continues to be one of the industries with the poorest safety record despite dramatic efforts in recent decades to reduce accidents and injuries. (Holmes, Triggs, Gifford, & Dawkins, 1997).

‘Checking the box’ of regulation compliance has not had a remarkable effect on reducing workplace injuries in the construction industry. United States construction workers are over three times more likely to be killed on the job when compared to all other industries. As well, one in six can expect to be injured every year (Carter & Smith, 2006). For decades OSHA has been regulating construction industry working conditions to minimize risk on construction jobsites. Arbitrary statements and flavor-of-the-week slogans such as “Work Safely” and “Safety First” are not effective management tools for creating and sustaining safe work environments. Legal requirements mandate documentation of safety policies while enforcement is left solely to SBGC discretion and the perceived value an organization places on OSH. The consequence of no established procedures to monitor, measure and control OSH standards is no enforcement. Effective administration of OSH standards requires safety systems be managed as equally as any other aspect of business. In its simplest definition, management is the effective and efficient use of resources to achieve organizational objectives.

Wingra’s management is adamant in their organizational objective to identify and control risk. However, Wingra does not have the necessary resources to develop an OSH management system beyond a compliance focus with the current management system options available. This is due to current safety management systems such as American National Standards Institute (ANSI) Z-10, Occupational Safety and Health Assessment Series (OSHAS) 18001 and OSHA Voluntary Protection Program (VPP) being of questionable appropriateness for Wingra to control risk. Each of these systems is beyond the scope, detail, and complexity required for a
SBGC. The essential time and resources to administer and sustain these types of systems is not feasible for a SBGC such as Wingra. Nevertheless, Wingra is resolute on improving current OSH management practices to move beyond the minimum protection of its compliance driven curriculum.

It is imperative the components of an OSH system be proportional to the level of risk and is kept to the minimum required complexity to address hazards effectively and efficiently. (British Standards Institute [BSI], 2007) The previous statement embodies the need for a SBGC like Wingra to appreciate only the components necessary for efficacy of OSH objectives. Wingra’s OSH activities are only designed to perform at a level of minimum compliance; non-compliance has the potential to create significant liabilities. The created liabilities target personnel, productivity, downtime, product quality, and third party liabilities. The ramification of these created liabilities equates to an increased likelihood of detrimental financial loss for the organization due to lack of identification, treatment and control of risk. SBGC such as Wingra are more financially fragile and less likely to be able to absorb, or even survive, a significant OSH incident.

Problem Statement

SBGC face administrative challenges to effectively and efficiently monitor, measure and control OSH standards and related documentation.

Purpose of the Study

The purpose of this study was to delineate the critical components of OSH management systems for assisting SBGC in effective and efficient monitoring, measurement and control of risk while appreciating the constraints on time and available resources.
Goals of the Study

The goals of this study are as follows:

- Define a systems approach for effective monitoring, measurement and control of OHS standards for a SBGC
- Identify the critical tasks, responsible parties and required resources for an OSH management system appreciating the constraints on SBGC
- Define SBGC management's role for effective risk control
- Delineate the consequences of inadequate risk control as it applies to SBGC

Significance

The significance of this study is embodied in positive impacts SBGC shall receive when implementing OSH programs consistent with the objectives of this study. Increasing an organization's capability to protect the health and safety of employees reduces the likelihood of unanticipated financial loss from personnel, product and liability exposure. SBGC are aggravated by limited access to human, economic, and technological resources. This concern must be recognized and appreciated as achieving optimal results is critical to ensure effective use of the limited resources available. Safety systems designed for larger organizations have proved ineffective for SBGC due to the required investment of resources and complexity in administration. (Champoux & Brun, 2003)

Assumptions of the Study

The following list contains the assumptions of this study:

- All literature reviewed contained valid information
• All interviewed industry professionals fully understood the questions and gave honest answers based on firsthand experience

Limitations

The following list contains the assumptions of this study:

• Collecting, analyzing and reporting data occurred over the course of one semester

• No exhaustive review of literature was performed

• Data from interview responses was collected from six construction industry safety professionals who manage OSH operations with greater than 25 full-time employees

• Qualitative analysis of the collected data was based on the knowledge, education and professional opinion of the researcher
Chapter II: Literature Review

The purpose of this study is to define the critical components of safety systems for assisting SBGCs in effective and efficient monitoring, measurement and control of OSH risk while appreciating the constraints on time and available resources. SBGC may struggle in their efforts to best focus resources for reducing the likelihood of safety related incidents and liability. It is imperative all efforts achieve optimal results due to resource constraints. The implementation of a "systems approach" to monitoring, measuring and controlling OSH performance standards could be an effective tool for reducing the likelihood of OSH incidents while accounting for limited resources. This approach requires a clear delineation of responsibility for each participant to ensure the system is effective. A key factor in this scenario requires SBGC management to be at the forefront of each decision related to OSH. Their leadership impacts each employee’s perception and behavior, management decisions are echoed through the daily actions of each employee. Their active and visible commitment can produce a positive influence on each employee thus strengthening a culture of OSH awareness and acceptable practices. This concept is paramount due to SBGC relative risk level. SBGC are more financially fragile and may not be adequately prepared to absorb a significant and unexpected financial loss from an OHS incident.

Systems Approach to OSH

SBGC with incurred losses due to OSH related incidents tend to approach OSH more seriously. However, solutions tend to be based on climate of conditions rather than utilizing a systematic approach. A concentration of efforts and resources is typically placed on problems based on occurrence of accidents rather than attempting to develop a culture to counteract OHS related incidents. (Champoux & Brun, 2003) Current understanding of OHS risk control suggest
that at the small business end of the industry there is a fatalistic resignation to OHS risks being an unavoidable part of the job. This leads to an emphasis on individual rather than technological control for OHS risks. (Lingard & Holmes, 2001) Safety systems are able to be designed to incorporate any project scope in order to comply with the requirements of federal, state and municipal codes. (Terro & Yates, 1997) To be effective, system implementation must be appreciated during all phases of the project. SBGC require a specific, customized approach in order to effectively promote the awareness and management of OHS in their organizations. (Champoux & Brun, 2003)

Small firms may experience serious problems aggravated by limited access to human, economic and technological resources when developing and implementing OSH systems. Methods developed specifically for larger firms cannot be transferred to smaller firms. (Champoux & Brun, 2003) There is no single remedy or ‘one size fits all’ approach a SBGC can utilize for reducing the likelihood of occupational injuries. The system must be tailored to the specific needs of the SBGC and utilize multiple strategies to address risk. (Holmes, Triggs, Gifford, & Dawkins, 1997) To be effective, an OSH management system must contain the following three characteristics (Terro & Yates, 1997):

1. Clear definition of the organizational objectives in OSH
2. OSH must be incorporated into the planning during all stages of the project
3. Assigning of responsibility to ensure the OSH function is carried out

These three characteristics are intended to target priority risk in order to reduce the likelihood of financial loss to the organization. Once risk is identified, organizational objectives are established in order to assign individual responsibility for risk control. Each assigned responsibility must clearly communicate the critical tasks required to achieve the organizational
objectives. The critical tasks are intended to develop and promote a common understanding of unacceptable practices. It becomes crucial that a company’s common understanding overcome the view of risk as a normal and routine part of daily operations. (Terro & Yates, 1997)

Risk perceived as routine in daily operations is a potentially significant liability to an organization. Organizational leadership must develop a comprehensive understanding of what risk is present within their organization to begin developing effective strategies for risk control. Analyzing existing data is a cost effective option for a SBGC to identify loss potential within their organization to determine which factors pose the greatest likelihood to influence accidents. Gathering relevant, existing data from studies already conducted will assist in identifying key sources of problems. Data can be used to create prevention programs, improve construction practices and implement different management systems to address specific concerns. (Terro & Yates, 1997)

Once management develops a clear understanding of how risk effects their organization, it then becomes necessary to use this information to improve the quality of OSH for all employees in order to reap the benefits of an effective safety system. Occupational safety in business is becoming largely dependent on preparation and conformance to the appropriate technological procedures. These procedures are only effective if the system is designed and managed to ensure quality is not compromised. Different preventative measures can be adopted according to each unique workplace situation. A safety system must establish clear and attainable objectives. Also, each objective requires assigning responsibility to individuals with the capacity and authority to ensure effective implementation, management and control of the OSH function. (Terro & Yates, 1997) While it is necessary for an organization to empower employees, it must also be understood that the concept of safety is an organizational responsibility to continually
nourish and develop. An organization should institute a systematic and comprehensive OSH training program for risks inherent to the organization. Training is a tool that should be utilized for developing concepts of organizational culture in new employees as well as re-educating and retraining veteran employees on current OSH issues effecting the organization. (Vredenburgh, 2000) Training is an effective control measure intended to target hazards at the source by changing behaviors and perceptions of the employees. (Lingard & Holmes, 2001) Specific, customized approaches are required to promote awareness and management of OHS in small firms. (Champoux & Brun, 2003) However, the most effective means for providing health and safety outreach to small businesses is not clear. Nor is it apparent how to approach practical safety training since most firms cannot afford a dedicated safety professional to administer such programs. Therefore, it becomes the responsibility of SGBC management to ensure creative and nontraditional methods of training employees are developed for continual and repeated campaigns to disseminate information. (Lentz & Wenzl, 2006)

Developing a total risk picture to identify training needs and required resources places additional burdens on management, supervisors and employees. Safety, although worthwhile, may be costly to implement. As costs begin to raise, safety typically is an item continuously sacrificed. This is why a system of interrelated components is more advantageous than a program initiated as something separate to normal operations. A system cannot be left behind – it is how the work is designed to be preformed. (Terro & Yates, 1997) However, since the construction industry is predominantly a male dominated and blue-collar industry, research suggests that males have been found to be more resistant to participation in programs designed to change workplace health and safety culture. (Lingard & Holmes, 2001) These findings further advocate the necessity to develop a system centered on acceptable performance standards in an attempt to
remove an individual's perceived belief that their employer is attempting to change their personal beliefs.

As work becomes more organized around the understanding that safety is equally as important as quality and productivity, an employer reduces the direct and indirect organizational factors that account for 80-90% of all work related accidents and safety-related financial loss. Work organization is widely understood as one of the most important elements in every system of occupational safety and loss control. (Lewandowski, 1997) However, as a SBGC, there are three key issues to overcome in order to reap the benefits of an effective OSH system (Champoux & Brun, 2003):

1. Employer isolation
2. Lack of understanding on how risk effects daily operations
3. Lack of resources

As discussed earlier, lack of available resources typically is the greatest challenge for a SBGC. However, loss prevention activities are preformed in smaller firms. Loss prevention activities are generally required to ensure production efficiency – i.e. vehicle inspections, equipment maintenance and housekeeping are common. These proactive measures suggest the successful integration of risk control activities into production. (Champoux & Brun, 2003) Risk control as an integral part of normal operations should focus on proactive measures such as training and inspections. These measures would require the expenditure of fewer resources as an organization would focus on developing organizational awareness to risk verses only investing in costly technological controls. (Vredenburgh, 2000)
Responsible Parties and Critical Tasks

Construction contracts outline responsibility and define authority for safety on a project. Providing substandard or unclear clauses in contracts with ambiguous direction and accountability lead to confusion about who is responsible for safety during construction. Contracts should specify the hazard prevention requirements and responsible parties. Regardless of an organization's size, a safety system must accomplish the following purpose: identify authority to assign responsibility for health and safety to appropriate entity. This may either be the owner, construction manager, supervisor or as specifically stated in the contract. (Terro & Yates, 1997) SBGC typically experiencing frequent variation of contracts and tasks may experience difficulty selecting preventative measures to control loss exposure. (Champoux & Brun, 2003) Effective OSH systems require a certain degree of knowledge on the part of the employer as they are the ones ultimately responsible for encouraging the activities centered on improving occupational safety within their organization. (Lewandowski, 1997) However, this is no small task. Many obstacles impede a SBGC from developing and implementing an effective OSH management system to reduce the likelihood of financial loss from safety-related incidents. Some common obstacles are (Champoux & Brun, 2003):

- Loss control costs
- Delays in production during initial implementation
- Inadequate resources for managing the individual OHS programs
- Additional paperwork
- Lack of time
- Planning dilemmas
- Insufficient staff
SBGC management must realize current employees are already performing many of the critical tasks necessary for an effective OSH system. Though priorities may not be centered on safety, the management structure is defined and capable for carrying out OSH objectives. To be effective, OSH must be managed as equally as every other company function. This begins with SBGC management who instruct the site supervisors to perform tasks on-site consistent with organizational objectives. Management objectives must fix accountability on the performance of each employee to ensure results. An employee who is held accountable shall accept the given responsibility. Typically, an employee who is not held accountable shall not accept the given responsibility because he or she shall devote the most attention to what is being measured about their performance. The targets management exerts pressure on – i.e. quality, production, cost reduction – is what the employee shall focus their efforts towards achieving. (Peterson, 2003)

Supervisors are one of the most effective promoters of safe working practices since he/she typically manages the way work is to be performed and has direct influence on where employees focus their efforts. Supervisors disseminate instructions to each employee based on their responsibility. They exert the greatest influence on employees’ attitudes toward safety and have direct influence over the practices ensuring safety performance of their crews. (Terro & Yates, 1997) As well, OSH on the jobsite is essential to keeping losses to a minimum and supervisors are responsible for accomplishing these objectives. (IRMI, 2005) Employees working under supervisors who do not place a strong emphasis on OSH perceive it as unimportant. The motivation to perform a job in a safe manner is a function of both the individual’s own concern with safety as well as managements expressed concern for safety (Vredenburgh, 2000) Management’s attitudes toward safety are reflected in an employee’s daily actions. It is through these daily actions that OHS activities move from concept to reality. Active
participation in OSH initiatives is common in firms where employees are empowered with the responsibility to uphold safety performance standards. This suggests that small firms struggling in OSH participation should encourage more employee participation in safety management systems. (Champoux & Brun, 2003) Active and consistent participation creates visible efforts to motivate employees and inspection checklists are a primary tool for evaluating on-site conditions and practices. Assigned responsibilities are able to be measured through routine, systematic and documented inspections. Inspections are the basic tool for maintaining accountability of safe conditions and upholding standard practices. These documents become the records to measure performance of OHS objectives. The following list illustrates why inspections are performed (Peterson, 2003):

- Re-awaken employees’ interest in OSH
- Visibility display management’s sincerity on OSH
- Evaluate safety standards to ensure positive and continuous impact on OSH performance
- Identify unknown hazards, changes in conditions and unsafe practices
- Document OSH deficiencies for correction
- Develop legal records of OSH practices

Employees understand the significance of OSH by the actions and attitudes their supervisor has in hourly and daily contacts with them. (Peterson, 2003) In order that each employee continuously engages OSH as a non-negotiable priority, supervisors must engage in regular, visible, safety-related activities to set precedence. Employees typically react and respond to the priorities in a similar manner as their supervisors. There is equal significance in the
supervisor's ability to be able to coach an employee individually and coach a collective group. The supervisor is more than just a stagnant and compartmentalized middle manager in the construction process. Their leadership is crucial in determining the culture of the organization. The responsibility for determining what is done or not done for advancing an organization's efforts in OSH commonly rests with the supervisor. No policy or manual is more important than the leadership displayed by the supervisor. Their actions and decisions send clear messages about what is truly valued by the organization. (Peterson, 2003) Many options exist for supervisors to advocate and enforce OSH objectives. Some methods supervisors can use support OSH are (IRMI, 2005):

- Toolbox talks and crew meetings to support daily OSH performance
- Set the example by continuously practicing OSH standards
- OSH is non-negotiable and included in each decision to be made
- Emphasize and develop a common understanding of OSH values to new employees
- Action plans for safety are clearly communicated to each employee for every job and task
- Provide the necessary tools, equipment and resources to support efforts for OSH

It is important to note that supervisors who are ineffective communicators will hinder an organization's efforts in OSH. Effective communication helps to secure each employee's continued motivation and willing participation in OSH objectives.

While employee participation is a critical element to the success of a safety system, it is also necessary to utilize appropriate technological controls to reduce exposure. When
technological controls are to be implemented, it is essential they are assessed to determine their impact to risk control. This is necessary as the conditions of jobsites are continually in flux. Project level safety systems are more manageable because it is easier to implement specific and concise controls to deal with specific issues. Safety controls can be identified through weekly or biweekly job meetings and special safety meeting with supervisors, project managers and supervisors. Effective communication is necessary to develop a complete understanding of the present risks on-site. Supervisors, through the use of regular inspections, assist in determining whether work is being properly performed to safety performance standards. (Terro & Yates, 1997)

The selection of appropriate technological risk controls can often be achieved only if OHS risks are considered prior to the execution phase of a construction project. (Lingard & Holmes, 2001) As well, the financial cost associated with supporting risk control efforts must be realized. Typically, OSH requires between 2.5% and 8% of total payroll for a project to adequately support the system. (Lindberg, 2007) Reactive and after-the-fact practices to determine necessary controls for OSH may create additional financial burden during the course of the project. Management's decision not to include OSH in the planning phase may lead to creating barriers thus impeding implementation by responsible parties during the construction phase. Decisions about the necessary control measures are to be continually assessed throughout the entire life of the project. To be effective in assessing the necessary controls requires all parties involved in the construction process to bear some responsibility for managing risk. This requires OSH to be considered by clients, designers, material and equipment handlers, principal contractors, subcontractors, and project managers. (Lingard & Holmes 2001) A description and identification of hazardous operations are required to develop a plan to identify the necessary
controls to reduce risk to acceptable levels. As well, adequate emergency response and first aid equipment must be provided for emergency procedures when hazardous operations have been identified. Records of inspection are to developed and maintained ensure proper working condition of emergency response equipment. (Terro & Yates, 1997)

SBGC are able to use less elaborate control methods and typically focus efforts on employee behavior, personal protection and activities which are designed to ensure production efficiency. (Champoux & Brun, 2003) Training allows a SBGC to develop and maintain core values within the company. Training also provides the means for making accidents more predictable through education and awareness. Training programs should focus on areas where losses are typically experienced and should be approached as a systematic process of evaluation and instruction to achieve organizational objectives in OSH (Peterson, 2003):

1. Evaluate where employees are in terms of their knowledge and skill set in OSH
2. Research and delineate where employees’ knowledge and skill sets are required to be in order to meet operational OSH objectives
3. Systematically provide the difference

The fundamental difference between safe employees and those who frequently get injured is that safe employees are able to recognize jobsite hazards and hazardous actions. Properly trained employees understand the consequences and repercussions of their actions. (Vredenburgh, 2000) Training generates a common understanding of an employee’s expectations within an organization. Project safety is accomplished when the required information is distributed and implemented by individuals with the authority and responsibility to provide adequate
descriptions of performance expectations. Each employee must know how safety is incorporated into his/her responsibilities of their job. (Terro & Yates, 1997)

Several possibilities exist for employers to develop their own specific training programs. However, the time and required resources to develop these programs may exceed the availability and capacity of a SBGC. Training is available by OSHA to assist SBGC burdened by resource constraints who cannot afford to develop their own training programs. OSHA offers two construction safety training courses to facilitate greater competency of OSH for the construction industry: OSHA 10-hour and OSHA 30-hour construction industry outreach training. The following is a summary of the content in each course (OSHA, 2008):

10-hour Construction Outreach Training Course

- General Safety & Health Provisions
- Electrical
- Fall Protection
- Personal Protective & Lifesaving Equipment
- Materials Handling, Storage, Use & Disposal
- Hand & Power Tools
- Scaffolds Cranes, Derricks, Hoists, Elevators & Conveyors
- Excavations
- Stairways & Ladders

30-hour Construction Outreach Training Course

- Introduction to OSHA, OSH Act, Inspections, Citations, and Penalties
• Walking and Working Surfaces
• Means of Egress and Fire Protection
• Cranes & Hoists
• Electrical
• Flammable and Combustible Liquids
• Fire Prevention & Protection
• Personal Protective Equipment
• Machine Guarding
• Material Handling
• Hazard Communication
• Introduction to Industrial Hygiene/ Blood borne Pathogens
• Health & Safety Programs

The purpose of these courses is to develop core competencies to identify hazardous conditions and substandard practices. As well, trainees develop an understanding of how regulatory compliance impacts the construction industry.

*Management’s Function in the OSH Management System*

Management’s perception of the risk effecting their organization may dilute necessary resources to be allocated for effective risk control. If accidents are relatively infrequent, management’s perception of OHS exposure will be further distorted and wrongly believe the status quo is acceptable. In turn, OSH shall be very low on their list of priorities. This is further exacerbated when management understands the need for more OHS training but priorities are continually shifted to production. It is unfortunate that some employers believe their OSH
management is adequate simply because problems rarely occur. This understanding is typical in small businesses as management can be isolated from the processes, overworked with other priority tasks and do not use services offered by OSH professional associations to assist in reducing risk. (Champoux & Brun, 2003)

One method of improving OSH conditions in the small business sector requires the owner(s) of the organization to organize a safety system to include identifying relevant training, preparing necessary education materials and defining roles of responsibility to uphold OSH standards. Management leadership has been identified as a significant influence on an employee’s perception of safety. (O’Toole, 2001) Typically, construction industry management leads by command-and-control. This structure is not equal in many decision making processes including decisions made on safety related activities. This is due to the likelihood of decisions proceeding through too many error-producing junctures, in tum resulting in unsafe conditions and behaviors. (Lingard & Holmes, 2001) A safety system may be new to many organizations and implementation will be easier when promoted as a quality assurance system to improve upon current practices. Once safety is viewed as something separate to the process, it shall be treated in a similar manner. (Lewandowski, 1997) This understanding is critical to ensuring management’s continued commitment in the OSH system. The ‘here today, gone tomorrow’ mentality only demonstrates management’s lack of commitment which employees shall identify with.

A commitment to perform a job consistently to OSH standards requires motivation to do so. Employees should be motivated and encouraged to promote and practice safety issues; they are also essential to help identify critical factors in order to establish safety rules and procedures. Motivating employees and recognizing performance are key factors in a successful safety
system. (Terro & Yates, 1997) Employees will not behave in a manner consistent to OSH
standards when they are not empowered with the authority to change their own actions and to
improve working conditions. To be motivated, an employee must be supported with the
necessary tools, training, and leadership. Employees perceive the degree to which management
values safety by the level of risk they must personally assume. (Vredenburgh, 2000) Therefore, it
becomes necessary to influence the conception of what risks are present and the necessary risk
control strategies to employ for prevention. Evaluating risk and determining control measures
may be ineffective to reduce the likelihood loss if management and employees do not share a
common understanding of OSH risk control. Conflicting perceptions of risk in OSH generate
conflict that may create barriers to occupational injury prevention (Holmes et al, 1997)
Reduction of injuries is strongly impacted by management’s commitment to improve employee
perceptions of risk. Management’s commitment to leadership in safety has been identified as the
single greatest influencing factor having the maximum impact on employee perceptions of
safety. (O’Toole, 2001) Understanding of risk control can be influenced by perceptions of the
source of risk. (Lingard & Holmes, 2001) Perceptions influence employee decisions relating to
at-risk behaviors and decisions on-the-job. (O’Toole, 2001) A paramount characteristic of
influencing employee actions is effective communication. Communication leads to trust to foster
a climate where employees are alert to hazards. (Lingard & Holmes, 2001)

A universal acceptance of risk occurs when management’s lack communication and
influence over OSH issues allows conditions to erode when precautions are not taken to prevent
such occurrences. Creating low expectations and developing an acceptance to prevailing OHS
risk levels creates employees who feel they have little impact on decisions impacting the work
environment. An acceptance becomes common for employees to bear the burden of OHS risks.
Lack of knowledge was cited as a primary factor in whether or not employees perceived certain exposures to be of risk to safety and health. Not educating and training employees to be aware of inherent risks associated with their job allows for assumptions of no danger or risk being present. Commonly, employers view monetary costs and required time commitments as the barrier to developing and sustaining OHS systems within their organization. These are significant barriers SBGC must overcome when facilitating OSH activities and prevention. If money is perceived by employees as more important than their health and safety, a workplace culture is created on this perception. The perceptions and actions of management create the workplace culture regardless if one is attempting to be created or not. It is imperative that management support their position on OSH through actions as well as words of influence and leadership. (Lingard & Holmes, 2001)

A common problem may develop if management relaxes their efforts to support OSH. Employers who initially support an OSH system within their organization and become lax in their efforts to continually nourish and support its programs, tend to believe employees are responsible for their own accidents when they occur. This belief is founded on the premise that management expects employees to continually follow the preventative programs and written documentation in the OSH system. However, once OSH is treated as something separate, the identification and controlling of risk becomes separate from production and quality in daily tasks. (Champoux & Brun, 2003)

**Consequences of Inadequate Risk Control**

Lack of clear delineation of responsibility, poor management and neglect are significant contributing factors to OSH related incidents and accidents in the construction industry. A common misconception about responsibility and liability for OSH on construction jobsites is that contractors are the only ones who are responsible and liable for OSH. The reality is that owners
and construction managers are also contractually responsible and liable for ensuring OSH related activities are in practice. Construction managers and owners are liable due to their authority before the contractor. A common misconception is the construction process creates difficulties to establish priority between responsibility and liability. However, responsibility can be directly related to better performance on construction projects because this in itself, when performed as contractually agreed upon, reduces likelihood of being held liable in litigation due to negligence or breach of contract. Contractors are liable for the OSH incidents they were responsible for coordinating efforts to control. (Terro & Yates 1997)

Liability and responsibility lead to owners must recognize and demonstrate concern for construction safety in their actions. Recent trends realized by owners include the cost of worker’s compensation being reflected in the costs of their projects and escalation of litigation involving owners’ liability to workers injured on their jobs (Huang & Hinze 2006). Ignorance to safety leads to financial loss; owners included. Also, owners are better able to provide additional liability insurance coverage that contractors may have difficulty obtaining. (Terro & Yates 1997)

When the priority to prevent loss is shared by all parties involved in the construction process, many benefits can be achieved. Integrating safety into all components of the construction process is shown to have a ripple effect on reducing cost and increasing productivity. An effective safety system eliminates the interruption of work due to accidents. When there are no lost work days due to accidents, a project is better positioned to be completed on time and within budget. This correlates directly to the corporate image of an organization. Positive safety performance creates a better corporate image thus enhancing the bargaining power of a company during negotiations prior to the contracts being awarded. (Terro & Yates, 1997)
Project owners are increasingly aware of the necessity of safety training and the direct impact on their bottom line. It is through relevant training that safety is able to positively impact several issues effecting OSH performance. Adequate and effective training increases an employee’s perception of risk. This, in turn, develops proficiency thus creating less likelihood of an employee having an accident. An employee’s level of perceived danger increases their compliance to warnings and instructions. It is important to note, employees receiving training on risk inherent to their occupation respond more to severity of an injury in their judgments of safe practices, rather than on likelihood of an event occurring. It then becomes critical that all employees are trained to identify hazards associated with their tasks and fully comprehend the perils of not adhering to established standards for their welfare. (Vredenburgh, 2000)

While training can be an effective remedy, no single approach to safety guarantees desired and effective results. One example of this is when SBGC create an OSH management systems modeled after systems developed large organizations. Historically, SBGC have reaped little economic incentive from their efforts. This is due to OSH management systems designed for larger organizations being ineffective when transferred to smaller businesses (Champoux & Brun, 2003)

SBGC are less likely to be able to absorb financial loss due to ineffective OSH management. This problem is not isolated only to the costs of medical treatments, increased insurance premiums and other compensation awarded from the accident. Disturbances in the production process can add up to delays that do not allow a contractor to complete a job as contractually agreed upon. (Lewandowski, 1997) OSH incidents often involve litigation against the responsible party. While not always the case, this situation illustrates a potential financial impact to an organization outside the realm of insurable cost – i.e. civil suits and liability cases.
Other indirect costs outside of litigation may severely impact an organization’s profitability such as lost time of injured employee, lost time of other workers onsite, delays in production, lost supervisory time due to assistance, hiring and training of new employees, accident investigation, jury award and increases in worker’s compensation insurance premiums. (Terro & Yates, 1997)

The likelihood for loss increases when OSH prevention is not a primary concern to the organization. What is especially alarming is lack of growth in accident prevention in small business. (Lewandowski, 1997) Employers who chose to do nothing and accept the status quo as acceptable create poor risk perceptions in their employees. This supports an employee’s willingness to accept risk and high levels of hazards as a normal part of their daily tasks. (Champoux & Brun, 2003) Employers may not view OSH prevention as a priority due to the relative infrequency of accidents. Employers may view injury prevention as the full responsibility of each employee without having to be involved in the process. This approach creates conflicting risk judgments on the part of the employee as the employer effectively transfers the responsibility to reduce risk to employees without offering the required training, tools and leadership to be effective. A common response of employers who take this approach state that most accidents are caused by employees not thinking. (Holmes et al, 1997) This situation is exacerbated when owner-managers are responsible for all OSH issues and they do not assign any OSH responsibility to employees or allow participation in these matters. (Champoux & Brun, 2003)

Summary

A review of the literature suggests a systems approach to OSH to be the most effective and efficient for a SBGC. An integrated system to monitor, measure and control OSH related activities requires less administrative effort to manage, achieve organizational objectives and
sustain the desired results. SBGC who, do to resource constraints, struggle in their efforts to allocate the necessary resources for effective OSH risk control, are able to better focus efforts to achieve desired results when a systems approach is utilized. This approach requires an active participation by each party involved in the construction process to share in the responsibility to prevent loss. A clear delineation of responsibility is necessary to ensure the risk management function is effective. Efficient risk control occurs when employees are motivated to perform their jobs in a safe manner, empowered with authority to change working conditions and are trained on effective use of technological controls to reduce risk. This requires an organization's management to place OSH on top of their list of priorities. Management’s perceptions and actions involving OSH directly influence the outcomes of employee performance. Management’s commitment to OSH is a significant determining factor in the likelihood for incurring safety related losses. Direct and indirect costs associated with safety related losses can be substantial for a SBGC who is found liable due to irresponsibility in adequately providing safety controls to protect their employees and the public.
Chapter III: Methodology

The purpose of this study was to identify the necessary OSH management system components to assist SBGC like Wingra Construction, LLC in effectively and efficiently monitoring, measuring and controlling risk while appreciating the constraints on time and available resources. This requires an OSH system be designed to address accountability of organizational OSH standards without the need for exhaustive administrative efforts or a designated OSH specialist on payroll. The following goals summarize the scope of this research:

- Define a systems approach for effective monitoring, measurement and control of OHS standards for a SBGC
- Identify the responsible parties, critical tasks and resources required for an OSH management system appreciating the constraints on SBGC
- Define SBGC management’s role for effective risk control
- Delineate the consequences of inadequate risk control as it applies to SBGC

The research methods chosen for this study included:

- A review of relevant literature focusing on loss control and risk management for the construction industry
- Interviews with construction industry safety professionals

The goals of this research guided selection of literature to include in this study; each selection focused on loss control and risk management. The review of literature developed a baseline for comparing components of OSH management systems. Questions for the interviews
(see Appendix – A) were developed after identifying current knowledge, industry practices and OSH management techniques in the literature.

Subject Selection and Description

The sample population was selected by contacting construction companies who have a designated, full-time safety professional overseeing the OSH functions within the organization. A total of 12 prospective candidates were contacted and six voluntarily agreed to participate in the interview process. An informed consent agreement (see Appendix – B) was obtained outlining the candidate’s willingness to voluntarily participate in the study under strict observance of the individual’s confidentiality. As outlined by the consent agreement, no identifiers or other means to make each participant identifiable were used in this study. As well, no public dissemination of results with identifiable information was released. The circulation of the collected data was restricted only to the researcher for the intended analysis. All data was stored under lock and key. Also, all documents were shredded following data input. Each interviewed candidate’s participation began and ended at the interview.

Data Collection Procedures

Data was collected by reviewing relevant literature and interviewing construction industry safety professionals willing to participate in this study. The review of literature developed a baseline for identifying current knowledge, industry practices and OSH management techniques. Questions for the interviews (see Appendix – A) were developed after reviewing the literature. The following list summarizes the scope of each of the eight interview questions:

- Management’s function
• Employee Involvement
• Accountability and Responsibility
• Required Resources
• Training
• Documentation
• Critical Tasks
• Consequences of Inadequate Risk Control

Raw data was collected in interviews by asking each interview participant the same series of eight questions. The questions focused on uncovering each participant’s professional opinion on the necessary components to create and sustain an effective OSH management system within their organization. As well, the questions sought to validate which management practices are and are not effective at achieving OSH organizational objectives. The questions were designed to gather generalizable knowledge about current OSH practices that could be successfully transferred to SBGC. Efficacy required asking questions that appreciated the resource constraints of SBGC in order to make a qualitative analysis of the data transferrable.

Data Analysis

Data gathered from interviews and the literature review was qualitatively compared and contrasted to determine the most effective and efficient practices to manage an OSH system. Patterns and similarities of the collected data were identified and subsequently placed in eight categories; one for each interview question topic. Interview responses were grouped and summarized into each respective category. The generalized data was reported in the research results if the data was determined to be of value to a SBGC. For this study, value to a SBGC was
defined as the ability to develop, implement and sustain each component in the OSH management system without exceeding resource availability. By not exceeding resource constraints, effective transfer of the OSH management components to a SBGC was qualitatively determined to be valid.

Limitations of the study

- Qualitative analysis of the collected data was based on the knowledge, education and professional opinion of the researcher

- Only one semester was used to collect and analyze the data; time constraints did not allow for an exhaustive search of potential candidates to interview

- Data from interview responses was collected from construction industry safety professionals who manage OSH operations with greater than 25 full-time employees
Chapter IV: Results

The purpose of this research was to define the critical components of an effective OSH management system for assisting SBGC in controlling risk. A common approach for SBGC is to set OSH operational objectives to the minimum required expectations of compliance without established management systems for controlling risk. Resource constraints limit a SBGC ability to utilize current safety management systems such as OSHA VPP, ANSI Z-10 and OSHAS 18001 to effectively and efficiently control risk. Systems designed for a large organization with vast amounts of resources have proven to be ineffective when transferred to a SBGC. The required human, economic and technological assets to implement and maintain these types of management systems exceed the availability of a SBGC. In order to conceptualize viable options, a review of relevant literature centering on loss control and risk management was performed to recognize current industry knowledge and standard OSH management practices. The reviewed literature provided a baseline for comparing and contrasting OSH management system components to current industry practices. Interview questions generated from the literature review were asked to construction industry safety professionals in order to validate which critical components are necessary for assisting SBGC in effective and efficient risk control. The following data gathered from the interviews and literature review was grouped and categorized into subsections outlining the goals of this research.

Define a Systems Approach to Managing OSH

All interviewed safety professionals agreed that in order to be effective, OSH activities must be fully integrated into daily processes and valued as equally as other targets in the operation – i.e. quality and productivity. The literature review defined a system’s approach to
managing OSH as being interrelated components of operations that cannot separated or left behind because it is how the work is designed to be performed. This definition was supported with interview responses stating OSH cannot be treated as something separate and performed outside of, or in addition to, normal operations. Interviewed safety professionals stated the primary purpose of an OSH management system is to identify and measure risk present in the organization to reduce or eliminate it. Ineffective management of OSH activities, as indicated by the interview responses, occurs when the system intended to control risk waxes and wanes depending on the climate of conditions. To be effective, interview responses indicated an OSH management system must develop an organization’s total risk picture into accountable, continuously monitored and enforced organizational objectives for risk control. These objectives drive the creation of standards and/or operating procedures to establish core competencies in creating a safe workplace; acceptable/unacceptable practices are clearly documented and communicated to all employees. This information is supported by the reviewed literature which stated an OSH management system must contain the following three characteristics:

1. Clear definition of the organizational objectives in OSH
2. OSH must be incorporated and accounted for in the planning of each stage of the project
3. Assigning accountability-based responsibility to ensure the OSH function is carried out

Interview responses indicated risk control activities to be identified and designed during the planning phase of a project; the reviewed literature supports this statement. Construction safety professionals emphasized the necessity to proactively determine the specific requirements to control risk. Interview responses illustrated this point by indicating reactive approaches to
determining controls, assigning responsibility, identifying and providing training can create a significant burden on efforts to achieve OSH objectives. The system, as stated from the interview responses and supported in the literature, must have the capacity to allocate the required resources to support the specific responsibilities ensuring OSH practices are performed to established standards. Both the literature review and interviewed safety professionals share a common view that the success of OSH management system is dependant on the commitment and support received from the top of the management structure. This requires accountability be fixed to facilitate the OSH functions. Both the literature and interviews indicated the management system must fix accountability to ensure the OSH functions are carried out. These functions are not intended to surpass or supersede other systems in place. Interview responses indicated an OHS management system cannot work against existing systems ensuring, for example, quality or productivity. Rather, the performance standards are created to meet OSH organizational goals should support and improve the quality of performance in other systems.

In order to improve performance, the OSH system must be designed to monitor progress and identify performance gaps. The interview responses indicated routine compliance and conformance inspections, as well as, routine system performance audits be documented to verify the OSH functions are being performed to the established standards. Both the interview responses and reviewed literature support the use of documentation to assist in providing valid feedback on system performance. As well, each method of research indicated OSH documentation is used to support the need for improving OSH by documenting deficiencies in activities or conditions.
Critical Tasks, Responsible Parties, and Required Resources for OSH

Critical Tasks

The critical tasks of OSH were defined in the following context by the interview participants:

- The tasks required to ensure organizational OSH objectives are achieved
- The tasks that could lead to OSH system failure if not performed

The following list summarizes the interview responses of critical tasks to perform to assist in managing OSH:

- Define responsibility for OSH in the contract documents
- Develop a clear understanding of risk prior to beginning the work
- Determine the necessary controls, allocate the required resources and identify training needs in the planning stages
- Create measurable standards of performance
- Clearly define the roles and responsibilities in the OSH system
- Effectively communicate OSH responsibility to each participant in the system
- Fix accountability
- Provide effective training consistent with meeting organizational objectives
- Continuously enforce OSH standards
- Perform routine compliance/conformance inspections
- Continually assess risk control measures throughout the duration of the project
- Proactively measure performance against established standards
- Focus on measuring activities rather than results
- Provide immediate correction on substandard practices/conditions
• Investigate accidents/incidents to determine root cause
• Provide timely feedback to questions
• Annual OSH system review

The reviewed literature parallels the interview responses and supports the critical tasks to perform.

**Responsible Parties**

Responses to interview questions identified top management and supervisors in crucial leadership roles to ensure the OSH function is carried out. Responses from the interviews indicated top management to be responsible for:

• Clearly defining and communicating the organizational OSH objectives
• Allocating the required resources to facilitate the OSH functions
• Defining the roles and responsibilities in the OSH management system
• Fixing accountability to ensure the OSH function is carried out

Reviewed literature supports the interview responses by describing top management as being ultimately responsible for organizing the system, encouraging risk control activities and allocating the required resources to facilitate the OSH function.

Responses from the interviews indicated the supervisors to be responsible for:

• Continuous communication of OSH responsibility
• Active and consistent enforcement OSH standards
• Pre-task planning
• Daily crew meetings to emphasize OSH practices in the tasks to be performed

• Ensuring OSH is non-negotiable on-site

• Identifying and correcting substandard practices/conditions

• Performing compliance/conformance inspections

• Ensuring controls are in place and evaluate their effectiveness

• Assisting in OSH training and identifying training needs

• Investigating accidents/incidents and near misses

• Completing documentation on risk control activities

• Providing timely feedback on OSH questions

• Supporting a culture of safety awareness

The reviewed literature supports the interview responses indicating supervisors to be the most effective promoter of OSH practices as they are typically orchestrating how the work is to be performed. The literature indicated employees commonly react and respond to priorities in a similar manner as their supervisor. No manual or policy is more important than the leadership displayed by the supervisor. The literature further emphasized the importance of the supervisor by stating he/she exerts the greatest influence on employees' attitudes toward safety as they have direct influence over the practices ensuring safety performance. A common theme among the interview participants was that safety is every employee's responsibility. However, the literature review determined responsibility followed accountability. In order to make employees
responsible, they must be held accountable. Interview responses indicated employees will
dedicate attention to what is being measured about their performance. One participant in the
interview stated employees typically seek to only achieve an employer’s lowest expectations and
when OSH is not measured in their performance, it is often not performed.

*Required Resources*

Interview responses did not gather substantial data on specific resource requirements
because the total amount of resources required for managing OSH varies considerably from one
project to the next. Resource requirements were stated to be based on several confounding
variables including:

- Specific owner(s) requirements
- Federal regulations
- State laws
- Municipal codes
- Types of equipment
- Size of the project
- Project location
- Security
- Number and type of controls
- Types of training required
- Number of employees onsite
- Knowledge and experience of the contractor
Interview responses indicated the total dollar value of the required resources for managing OSH is primarily contingent on two factors:

1. Total number of controls required to effectively reduce risk to an acceptable level

2. Size of the operation

As stated in the literature review, total dollar value to support OSH ranged between 2.5% and 8% of total payroll for a project. This accounts for the preloss and loss prevention activities to reduce or eliminate risk but does not include the direct and indirect costs in the event of a loss.

*Management's Role in Risk Control*

All participants in the interview process agreed top management support, defined as the owner(s) or president(s), is mandatory for achieving OSH organizational objectives. The required resources are allocated based on top management's perceived priority and value of OSH for the organization. Providing the adequate resources facilitates the OSH functions and is visible action which assists in confirming organizational commitment to employees. Interview responses emphasized the need for top management's continuous, consistent commitment in upholding OSH standards by actively engaging in the process. All interviewed participants agreed that an employee's perception on OSH is created from the top down. Responses also indicated an employee's motivation and commitment to OSH being positively influenced when top management visibly dedicates resolute precedence to risk control. The reviewed literature supports top management's crucial role as they are ultimately responsible identifying, establishing and maintaining the OSH objectives. Also, the literature indicated top management's role for the goal setting, planning, resource allocation and organization of OSH
If OSH is to be valued throughout the organization, the accountability-based responsibility to oversee its function has to be assigned. Both the literature review and the interview responses indicated top management as having direct influence on developing standards of acceptable performance, assigning responsibility and fixing accountability to achieve organizational objectives; each must be clearly defined by top management. The reviewed literature, supported by interview responses, states continuous, effective communication on OSH is a vital responsibility for top management in order to nourish the organizational culture.

Consequences of Inadequate Risk Control

The following list encompasses the range of consequences interviewed safety professionals acknowledged could occur without adequate risk control:

- Fatality
- Life long disability due to injury
- Medical claims from injuries
- Overexposure
- Injuring/endangering the public
- Liability litigation or civil suits
- Increased insurance/workers compensation premiums
- Loss of reputation/goodwill
- Inability to bid certain projects
- Production delays
- Decreased moral
• Employee turnover/loss of staff
• Insufficient resources to meet objectives
• Loss of operational control
• No post-incident procedures in place to get the business up and running
• Decrease in profitability
• Disruption of service/activities
• Loss of external funding
• Breach of contract
• OSHA fines

This detailed list is supported by the literature as possible consequences to inadequate risk control. The reviewed literature stated poor management and neglect to be significant contributing factors to the direct and indirect costs associated with OSH incidents/accidents in the construction industry. The literature indicates they are more financially fragile and less likely to be able to absorb or survive a significant immediate and/or sustained financial loss due to ineffective OSH management. The literature supported interview responses on the direct or indirect cost associated with ineffective management. The following costs were identified in the literature:

Direct or hard costs:

• Wages for safety professionals or consultants
• Resource and operational costs to facilitate OSH
• Insurance premiums and/or
• Accidents and incidents
• Attorney fees
• Fines and/or penalties

Indirect or soft costs:
• Accident investigation
• Administrative expenses
• Repairing damaged property
• Lost time in injured employees
• Production delays
• Low employee morale and increased absenteeism
• Training and compensating for replacement workers
• Loss of reputation

The reviewed literature indicated a strong likelihood of considerable financial hardship for a SBGC if they are impacted with possible litigation involving negligence in their OSH responsibilities. Settlements from civil suits and liability cases typically have no limits and fall outside the domain of insurable costs.

While some costs can be measured in dollars and cents, others fall outside of this category yet still impact the bottom line. The consequences of ineffective OSH management and inadequate risk control are evident in the risk perceptions of employees. Reviewed literature contends poor perception of risk in employees is created by employers choosing to do nothing to control risk. This leads to employees believing the status quo of high risk and high levels of hazards to be routine during daily tasks. The literature review indicated employees who are not
held accountable for specific responsibilities, consequently do not participate in carrying out the OSH function.
Chapter V: Conclusions and Recommendations

Restatement of the Problem

Wingra Construction LLC, like many Small Business General Contractors (SBGC), set operational objectives of Occupational Safety and Health (OSH) to the minimum expectations of federal and state standards. SBGC face administrative challenges to effectively and efficiently monitor, measure and control OSH standards due to constraints on time and available resources. Typically, SBGC struggle in their efforts to adequately control risk. The purpose of this study was to define the critical components of an OSH management system for assisting SBGC in effective and efficient risk control while appreciating the constraints on time and available resources. An OSH management system for a SBGC must be designed to address accountability of organizational OSH standards without the need for exhaustive administrative efforts or a designated OSH specialist on payroll. Attempting to use OSH management systems designed for larger organizations have proven to be ineffective when transferred to smaller operations. This is due to the human, economic and technological assets required to implement and sustain current OSH management system options such as OSHA VPP, ANSI Z-10 and OSHAS 18001. The following goals summarize the expectations of this research:

- Define a systems approach for effective monitoring, measurement and control of OSH standards for a SBGC
- Identify the responsible parties, critical tasks and required resources for an OSH management system appreciating the constraints on SBGC
- Define SBGC management's role for effective risk control
• Delineate the consequences of inadequate risk control as it applies to SBGC

Methodology

The two research methods chosen for this study included:

1. A review of relevant literature focusing on loss control and risk management for the construction industry

2. Interviews with construction industry safety professionals

The goals of this research guided selection of literature to include in this study. The review of literature developed a baseline for comparing individual components of OSH management systems. Questions for the interviews (see Appendix – A) were generated after identifying current knowledge, industry practices and OSH management techniques in the literature. The questions focused on validating the separation between effective and ineffective OSH management practices. Interview responses to the questions were then grouped and categorized with the reviewed literature data to identify patterns and similarities between the two forms of data. Subsequent qualitative analysis compared and contrasted the two forms of research to determine if the information would be of value to a SBGC. For this study, value to a SBGC was defined as the ability to develop, implement and sustain each component in the OSH management system without exceeding resource availability. By not exceeding resource constraints, effective transfer of OSH management components to a SBGC was qualitatively determined to be valid.

Findings

Define a Systems Approach to Managing OSH
A systems approach to managing OSH is defined as interrelated components of operations that cannot be separated or left behind because it is how all aspects of the work are designed to be performed. The primary purpose of an OSH management system is to identify and measure risk present in an organization to reduce or eliminate it. The system must develop the organization’s total risk picture into accountable, continuously monitored and enforced organizational objectives for risk control. These objectives drive the creation of standards and/or operating procedures to establish core competencies in creating a safe workplace; acceptable/unacceptable practices are then clearly documented and communicated to all employees. An OSH management system must contain the following three characteristics:

1. Clear definition of the organizational objectives in OSH
2. OSH must be incorporated and accounted for in the planning of each stage of the project
3. Assigning accountability-based responsibility to ensure the OSH function is carried out

Critical Tasks

The individual critical tasks listed in Chapter 4 under the subheading Critical Tasks, are defined as:

1. The tasks required to ensure organizational OSH objectives are achieved
2. The tasks that could lead to OSH system failure if not performed

Required Resources

The total dollar value to support OSH activities ranges between 2.5% and 8% of total payroll for a project. The direct costs to maintain an OSH management system are primarily contingent on two factors:
1. Total number of controls required to effectively reduce risk to an acceptable level

2. Size of the operation

This accounts for the preloss and loss prevention activities to reduce or eliminate risk but does not include the direct and indirect costs in the event of a loss.

**Responsible Parties**

An organization’s top management, defined as the owner(s) or president(s), and supervisors were determined to be in the most critical leadership roles to ensure the OSH function is carried out. Each position exerts a significant amount of influence on employee attitudes towards OSH. Also, each position has direct authority over practices ensuring OSH objectives are achieved. Continuous communication and active, consistent enforcement of OSH standards clearly defines an organization’s commitment to the OSH objectives.

Compliance and conformance to OSH standards and objectives is a result of each employee practicing individual, accountability-based responsibilities to an acceptable level of performance. Employees dedicate attention to what is being measured about their performance. When OSH activities are not measured in their performance evaluation, it is often not performed.

**Management’s Role in Risk Control**

The value OSH has within an organization begins with top management. Top management, defined as the owner(s) or president(s), is ultimately responsible for identifying, establishing and maintaining the OSH objectives. Also, the authority and responsibility for goal setting, planning, resource allocation and organization of activities to achieve the OSH objectives rests with top management.
To achieve OSH objectives requires top management to assign accountability-based responsibilities to oversee individual functions within the OSH management system. The required resources to facilitate the OSH functions are allocated based on top management’s perceived priority and value of OSH for the organization. Providing the adequate resources is visible action confirming organizational commitment to the health and welfare of employees. As employees’ perceptions to OSH are created from the top down, top management’s active and consistent participation is vital to nourish the organizational culture and increase awareness.

Consequences of Inadequate Risk Control

Poor management and neglect are significant contributing factors to the direct and indirect costs associated with OSH incidents/accidents. The consequences listed in Chapter 4 subsection Consequences of Inadequate Risk Control ranged from employee fatality to liability litigation. As SBGC are more financially fragile, they are less likely to be able to absorb or survive a significant immediate and/or sustained financial loss due to ineffective OSH management practices.

Conclusions

SBGC, like Wingra Construction, LLC, require specifically tailored OSH management systems to effectively and efficiently control risk. The following conclusions were drawn from the collected data to assist SBGC such as Wingra to effectively and efficiently develop, implement and sustain an OSH management system to positively impact operational performance.

Systems Approach to Managing OSH

- The findings suggest clear, established OSH objectives drive the creation of standards and/or operating procedures to establish core competencies for creating safe and
healthful work environments. The findings also suggest OSH objectives guide resource allocation during the planning stages of a project to ensure the OSH function is carried out and the objectives are achieved. Based on the findings, it can be concluded that clear, established OSH objectives to be a significant contributing factor to the success of a SBGC OSH management system. Also, the objectives serve as a benchmark to strategically plan the goals and ascertain the required resources to carry out each individual objective.

- The findings suggest the financial cost of risk control activities shall be assessed during the bid and planning phases of a project. The findings indicated this activity shall be performed during the bid and planning phases to accurately account for the time, materials, equipment and labor required to effectively carry out all the OSH activities. Based on the findings, it can be concluded that successful results hinge upon necessary OSH resources being accounted for in the bid and planning stages of a project. Without the required resources available, OSH activities cannot be performed to meet the expectations of the organization's objectives.

- The findings suggest the most cost effective and efficient means to managing risk requires designing OSH activities directly supporting OSH objectives into the procedures of how the work is to be performed. The findings suggest OSH activities cannot be treated as something separate or in addition to normal operations. As well, OSH cannot be labeled as a priority because shifting priorities during the course of the project will remove focus and attention from the objectives of the organization. Therefore it can be concluded the climate of conditions cannot divert attention for the
activities ensuring the OSH function is carried out – operational targets of quality, safety and productivity are inexcusably related. It can also conclude that creating a single set of accountability-based, performance objectives encompassing all facets of these three targets to be the most effective and efficient means to ensure all targets receive equal focus and attention.

Critical Tasks

The research suggests the critical tasks listed below to be the activities a SBGC must perform to ensure the OSH function is carried out to achieve organizational objectives.

- The cost of risk control activities are to be included in the project bid
- Define roles and responsibilities for OSH in the contract documents
- Develop a clear understanding of risk effecting the operation prior to beginning the work
- Determine the necessary controls, allocate the required resources and identify training needs in the planning stages
- Create measureable standards of performance to treat OSH activities as equally as other targets of the operation – i.e. quality or productivity
- Create documentation to support OSH activities and uphold performance standards
- Clearly define the roles and responsibilities in the system to manage OSH activities
- Continuous, effective communication of OSH responsibility to every employee
- Fix accountability to ensure the performance of employees/subcontractors who are designated specific responsibilities for OSH
• Provide effective training consistent with meeting organizational objectives and addressing identified risks in the operation

• Continuously enforce OSH standards with active and visible consistency

• OSH activities are included in all pre-task planning performed on-site

• Daily crew meetings emphasize identified risk and the OSH activities to be performed

• OSH is non-negotiable when performing the work

• Perform routine compliance/conformance inspections

• Document all activities surrounding OSH

• Continually assess the effectiveness of risk control activities throughout the duration of the project; document assessments

• Proactively measure performance against established standards; focus on measuring activities rather than results; document deficiencies for correction

• Provide immediate correction on substandard practices/conditions

• Create a structured and transparent disciplinary action plan to address OSH violations; effectively communicate the repercussions of substandard practices

• Investigate accidents/OSH incidents/near misses to determine the root cause of the management system breakdown, determine controls for preventing similar breakdowns and document results

• Provide timely feedback to employee questions

• At a minimum, annually review the effectiveness of the OSH management system by comparing organizational objectives to actual results

Based on the findings of the research, I can conclude the critical tasks listed above to be the minimum risk control activities required for an effective SBGC OSH management system.
Responsible Parties

Based on the findings of this study, subcontractors and SBGC employees should be held accountable for designated and specific responsibilities in OSH. The findings suggest responsibility is a result of accountability. Therefore, it can be concluded that employees who are held accountable will accept the given responsibility. Furthermore, when OSH is not measured when evaluating an employee’s performance, it is often not performed.

The findings of the research also indicated two vital leadership roles and related responsibilities for effectively managing OSH:

1. Top management defined as the owner(s) and/or the president(s) of the organization
   - Clearly defining and continuously communicating the organizational OSH objectives
   - Identifying and understanding how risk effects the organization
   - Organizing the OSH management system
   - Allocating the required resources to facilitate the OSH functions
   - Defining the roles and responsibilities in the OSH management system
   - Fixing accountability to ensure the OSH function is carried out
   - Auditing OSH system performance

2. Supervisors
   - Nourishing the culture of awareness to OSH
   - Fully understanding risk effecting the project
• Proficiency in risk control techniques and strategies for reducing or eliminating risk
• Selecting the appropriate controls, evaluating their effectiveness and making necessary changes to achieve organizational objectives
• Identifying OSH training needs and assisting in training
• Continuous communication of OSH responsibility
• Active, visible and continuous enforcement of OSH standards
• OSH activities are included in all pre-task planning performed on-site
• Daily crew meetings emphasize identified risk and the OSH activities to be performed
• Ensuring OSH is non-negotiable on-site
• Understanding who (owners, subcontractors, employees, etc.) is responsible for specific OSH responsibilities
• Ensuring those who are responsible for OSH are held accountable
• Performing compliance/conformance inspections
• Identifying and immediately correcting substandard practices/conditions
• Completing documentation on risk control activities
• Investigating accidents, OSH incidents and near misses
• Providing timely feedback on OSH questions

Based on the findings of this study, it can be concluded that supervisors exert the greatest influence on employees’ attitudes toward OSH because they have direct authority and influence over the daily, onsite practices and procedures ensuring OSH performance. Furthermore, it can
be concluded that supervisors must consistently practice the company’s policies to ensure all employees understand the commitment and value of OSH as a requisite for employment. The research suggests attention is dedicated to what is being measured about an employee’s performance, as well as, practices, behaviors and attitudes displayed by their supervisor. Therefore, it can be concluded that employees will commonly react and respond to situations in a manner consistent with the exhibited actions and displayed attitudes of their supervisor.

**Required Resources**

The research suggests the required resources to support OSH activities for managing risk is primarily dependant on two variables:

1. Type and size of the project
2. Total number of controls required to effectively reduce risk to an acceptable level

The research indicated the total dollar value based on type, size and number of controls required to support OSH activities to range between 2.5% and 8% of total payroll for the project. Based on the findings of the research, it can be concluded the total dollar value to support the OSH activities of a SBGC to range between 2.5% and 8% of total payroll for the project.

**Management's Role in Risk Control**

The research suggests management’s involvement, dedication, communication and visible actions in support of OSH confirm the organization’s dedication and commitment to the OSH objectives. Based on the findings of the research, supervisors’ and employees’ perception
of OSH is created from the actions of management. Therefore, it can be concluded an organization’s culture is dependant on the values, principals and ideals management practices.

The research suggests management’s role in the OSH management system is as follows:

- Identify the risk present in the organization
- Define the organization’s OSH objectives
- Reinforce commitment by actively and visibly engaging in the process to facilitate OSH objectives
- Clear, effective and continuous communication of OSH objectives to all employees
- Allocate the required resources to support OSH activities
- Organize, plan and direct the goal setting of OSH
- Develop standards of acceptable performance
- Uphold and enforce the OSH standards
- Assign accountability-based OSH responsibilities
- Create a structured and transparent disciplinary action plan to address substandard OSH practices

Based on the findings of the research, it can be concluded SBGC management’s role to encompass all the aspects included in the above findings in order to successfully achieve organizational objectives in OSH.

Consequences of Inadequate Risk Control

- The findings suggest poor employee risk perception and lack of involvement is created from ineffective management, inadequate communication and lack of
assigned responsibility to perform risk control activities. Based on the findings, it can be concluded employees who are not held accountable for specific, assigned responsibilities in OSH, consequently do not participate in carrying out its function to achieve the organization’s objectives. It can also be concluded that responsibility to perform certain tasks is an affect of being held accountable for performing such tasks.

- The findings suggest SBGC are more financially fragile and less likely to be able to absorb, or even survive, a significant immediate and/or sustained financial loss due to ineffective management of risk control activities. The findings suggest SBGC involved in litigation due to negligence typically experience financial penalties exceeding the limits of their insurance and, in some cases, forfeitures fall outside the realm of insurable costs. Also, settlements from civil suits and liability cases typically have no limits and may also fall outside of insurable costs. Therefore, it can be concluded the survival of a SBGC following an OSH incident/accident is dependent on magnitude of such an event and whether or not insurance coverage is adequate to cover the loss. Also, it can be concluded risk control activities reduce likelihood of significant, unanticipated and underinsured financial losses from OSH incidents and accidents. Furthermore, based on the findings, it can be concluded that SBGC who poorly manage or neglect managing risk control, significantly increase likelihood of significant direct and indirect costs associated with OSH incidents and accidents.

**Recommendations**

The researcher recommends the following actions for Wingra Construction, LLC and other SBGC to positively impact performance in managing OSH:
• Determine the specific regulations affecting operations to serve as a baseline for
developing the OSH management activities. Once all federal and state regulations are
accounted for, compliance shall merely serve as the minimum objective rather than
the primary purpose.

• Define, document and effectively communicate the OSH objectives for the
organization. Each objective shall serve as the foundation for creating accountability­
based standards of acceptable employee performance.

• Develop and document standards addressing acceptable and unacceptable
activities/practices. Clearly define the roles, responsibilities and authority to uphold
established standards.

• Clearly define OSH requirements and responsibilities in contract documents. Utilize
indemnification or “no fault” clauses in order to assist in transferring responsibility
and liability.

• OSH objectives are achieved by active, visible and consistent participation by the
organization’s management and supervisors. These individuals are to be a SBGC
living expression of company values in OSH.

• Identify and analyze risk effecting operations and do not focus simply on physical
hazards. Centering OSH efforts on physical hazards or conditions as OSHA
regulations mandate does not have a dramatic impact on reducing overall risk to an
organization. OSHA regulations are the minimum standard, not the ideal standard.
One hundred percent compliance with OSHA will not eliminate all workplace
injuries, illnesses, and fatalities. Too many organizations focus on OSHA compliance
and do not make enough of an effort to identify risk effecting their work environments and employees.

- Include the cost of risk control activities in the project bid and allocate the required resources during the planning stages of the project. The bottom line is OSH costs money in order to protect valued assets of an organization. Therefore, the required time and resources to facilitate the OSH function must be included in each estimate when bidding a job.

- Do not separate OSH from normal operations or treat it as disconnected from the process. Design OSH activities into how the work shall be performed. Quality, safety and productivity are inexcusably related and require equal attention.

- Define, document and effectively communicate the roles and responsibilities in the OSH management system. Fix accountability to perform OSH to employees and subcontractors.

- Performance evaluations for employees and subcontractors shall include OSH performance in management’s decision for raises, promotions, contract awards, etc.

- Effectively train employees to their individual assigned responsibilities and level of expected performance.

- While constraints on available resources may limit certain options for a SBGC, it is essential to have adequate documentation and records supporting OSH activities. Certain records are mandated by OSHA and various other government agencies depending on the geographic location of the business. It is recommended that SBGC understand the extent to which documentation and records fundamentally to protect the organization in litigation involving OSH related incidents. Various professional
organizations such as Associated Builders and Contractors, Incorporated (ABC) and the Associated General Contractors of America (AGC) can assist a SBGC in defining and creating the required documentation and records.

- Develop a transparent and effectively communicated disciplinary action plan for employees and subcontractors to address OSH violations; OSH shall be nonnegotiable and infractions are intolerable.
References


Appendix A: Interview Questions for Construction Industry Safety Professionals

1. Please describe management’s function in the OSH management system.

2. Please describe how employee involvement, or lack thereof, can positively or negatively impact the OSH management system function and organizational objectives.

3. Please describe the role of individual accountability and responsibility in the OSH management system.

4. What are the required resources to support and facilitate OSH activities in order to achieve organizational objectives in OSH?

5. Two part employee training question:
   - Please describe the role of employee training to ensure OSH organizational objectives are achieved.
   - How is training identified, performed and quality measured?

6. Two part documentation and recordkeeping question:
   - What documentation and records are required to support the OSH functions?
   - How can documentation and recordkeeping be minimized and still achieve the desired results?

7. Two part critical task question:
   - Please identify the critical tasks that must be performed in order to ensure the OSH function achieves organizational objectives.
   - How do you ensure these tasks are performed?

8. Please describe the consequences of inadequate risk control.
Appendix B – Informed Consent Agreement

Human Subjects Consent Form for Interviews

Title: Effective Monitoring, Measurement and Control of Occupational Health and Safety Standards for Small Business General Contractors

Description:
The focus of this research is on the construction industry centering on small business (<50 employees) general contractors. The research objective is to develop an Occupational Health and Safety (OHS) monitoring and measurement system understanding the restraints of time and resources on small businesses. Efficacy requires developing a system requiring no more than 2 hours of direct time cost per week per jobsite equating to (40 hours per week / 2 hours per week) = 0.05 or 5% of actual time spent per week to achieve effective and efficient results.

The significance of this research is embodied in the development of an effective OHS monitoring and measurement system minimizing the direct costs of implementation, training, administration, measurement and process/document control. Many small business general contractors shy away from implementing an OHS program due to current program/system complexity, ambiguity, lack of knowledge about the subject, anticipated costs and lack of perceived benefits. The system to be developed shall use technology to reduce/eliminate the paperwork involved in an OHS system. This requires the program be designed to monitor and measure accountability of standards without the need for exhaustive administration efforts or a designated OHS specialist on payroll.

Risks and Benefits:
The inherent risks involved with participating in this project are minimal. Individuals will not be identified by name or other means as to make them identifiable. There shall be no public dissemination of results with identifiable information. The circulation of data shall be restricted only to be viewed by myself for intended analysis. All data shall be stored in my house in my private fire safe under lock and key. All documents shall be shredded following data input. All electronic documents shall be secured with a high level of security. There shall be no direct/indirect identifiers, as well there shall be no names or other identifiers shall be recorded.

The benefits gained from the interviewer’s answers add an industry professional perspective and credibility to the results and conclusions of this study.

Time Commitment and Payment:
The duration of time you are willing to participate is decided by you. You may choose to participate for whatever time you feel comfortable. To complete the interview in full is estimated to take no more than 1 hour, however you may choose to end the interview at any time.

No payment or compensation is offered.
Confidentiality:
Individuals who perform the interviews will not be identified by name or other means as to make them identifiable. There shall be no public dissemination of results with identifiable information. The circulation of data shall be restricted only to be viewed by myself for intended analysis. All data shall be stored in my house in my private fire safe under lock and key. All documents shall be shredded following data input. All electronic documents shall be secured with a high level of security. There shall be no direct/indirect identifiers, as well no names or other identifiers shall be recorded.

Right to Withdraw:
Your participation in this study is completely voluntary. Your choice not to participate will not bring about any adverse consequences. If you choose to participate and then decide you wish to withdraw your voluntary offer to participate, your choice not to participate shall not bring about any adverse consequences.

IRB Approval:
This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

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Statement of Consent:
By signing this consent form you agree to participate in the project entitled, *Effective Monitoring and Measurement of Occupational Health and Safety Standards for Small Business General Contractors*

Signature.............................................. Date