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The Role of Leadership in Safety Performance and Results

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2011

Abstract

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BS, Fairleigh Dickinson University, 1983

Dissertation Submitted in Partial Fulfillment

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Abstract

Employee injury rates in U.S. land-based operations in the energy industry are 2 to 3 times higher relative to other regions in the world. Although a rich literature exists on drivers of safety performance, no previous studies investigated factors influencing this elevated rate. Leadership has been identified as a key contributor to safety outcomes and this grounded theory study drew upon the full range leadership model, situational leadership, and leader-member exchange theories for the conceptual framework. Leadership aspects influencing safety performance were investigated through guided interviews of 27 study participants; data analyses included open and axial coding, and constant comparisons identified higher-level categories. Selective coding integrated categories into the theoretical framework that developed the idealized, transformational leader traits motivating safe behaviors of leading by example, expressing care and concern for employees' well-being, celebrating successes, and communicating the importance of safety (other elements included visibility and commitment). Employee and supervisor participants reported similar views on the idealized leader traits, but low levels of these qualities may be driving elevated injury rates. Identifying these key elements provides the foundation to creating strategies and action plans enabling energy sector companies to prevent employee injuries and fatalities in an industry where tens of thousands of employees are subjected to significant hazards and elevated risks. Creating safer workplaces for U.S. employees by enhancing leaders' skills, building knowledge, and improving behaviors will improve the employees' and their families' lives by reducing the pain and suffering resulting from injuries and fatalities.

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Dedication

This dissertation is dedicated to my husband, Joe Caravello, who has been my unwavering supporter during this entire journey. He pitched in far more than his fair share to ensure I had the opportunity to study and write. He made this intellectual journey that much easier and I will always be grateful. This dissertation is also dedicated to my late mother, Stasia, who always supported my academic pursuits and made sacrifices to allow me the opportunity of higher education. She was disappointed when I left the Ph.D. program at the University of Houston, even though she was proud that I was moving on to an exciting career. Today, I know she is ecstatic to see both aspects of my professional life accomplished. Thank you Joe, and thank you mom this accomplishment could not have happened without both of you.

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My journey through the Ph.D. program at Walden University was made possible by so many people and they all deserve my sincere gratitude. First, my husband who has been my supporter throughout the program. Your encouragement made me push that much harder knowing that you were putting your life on hold to some extent while I took this sidetrack. My family and friends also encouraged me and very importantly were always interested in the process, I never wanted to have to tell them that I did not accomplish something that I had planned and so I pushed to get it done. Thank you all for the gentle pushes.

I want to acknowledge and thank the senior leaders of my company for allowing me to conduct this research and for supporting me throughout the process. The employees volunteering for the study were wonderfully open with me and very willing to provide the data that is the foundation of this study. My thanks to everyone that participated; it is my hope that our work will make a difference in our industry. To my colleagues at the office and in peer companies, thank you so much for reviewing and commenting on my interview questions and working theories. Your comments and discussions were invaluable and helped improve this study. A special thanks to Kam Noren who helped with many aspects of the work and kept me sane when formatting problems threatened to make me crazy.

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This truly has been a wonderful journey for me, I have learned so much about leadership and about myself, thank you everyone for helping to make it possible.

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Chapter 1: Introduction to the Study

Introduction

Every day, individuals leave their homes to participate in their chosen professions with the full expectation of returning at the end of the day or shift in the same condition as they left, albeit potentially tired, fulfilled, frustrated, relieved, or exhilarated. The reality in far too many cases is that they may not return home at all if they are injured or killed on the job. Workplace injuries and deaths are a sobering consequence for employees in the U.S. and all countries of the world. The Bureau of Labor Statistics (BLS) annually reports workplace injury rates and identified approximately 4.6 million employees were injured on the job (private and public sectors figures combined) in the United States in 2008 (BLS, 2009). Sadly, injuries and deaths occurred in many industries considered benign such as teaching school (e.g., Asmussen & Creswell, 1995), and these types of fatalities can be shocking to the public. Injuries and deaths in industries considered dangerous may be less shocking, but no less tragic.

Energy extraction, or oil and gas exploration and production, as it is more commonly known, is considered a dangerous industry (Mearns & Yule, 2009). Companies in the energy industry explore for oil and gas on a global scale through a technically demanding process in developed, developing, and remote geographic areas. Consequently, workplace requirements expose employees to physically, psychologically, and medically dangerous conditions. Understandably, companies in this industry endeavor to provide safe working conditions to protect employees from potentially dire consequences. Similar to various governmental agencies (e.g., BLS), energy companies

keep specific injury reporting statistics not only to satisfy regulatory requirements, but also as a means of understanding injury causes and for developing preventative solutions. As a tightly connected global industry, the record-keeping practices result in transparency of injury rates from all energy producing geographic regions primarily aided by key industry associations such as the International Oil and Gas Producers Association (OGP) and the International Drilling Contractors Association (IADC). The annual statistical reports published by these two organizations revealed a startling trend related to regional injury rates. The U.S. land-based operations of the energy industry have the highest employee injury rate relative to other geographic regions, for example offshore operations in the U.S. (2009 land-based employee rate: 3.11 or 3.11 employees injured per every 100 employees, 2009 offshore operations injury rate: 0.98 or 0.98 employees inured per every 100 employees injury; 2008 land-based rate: 4.11 versus 1.25 offshore operations rate; IADC, 2008, 2009).

Safety practitioners in the energy industry have observed, discussed, and attempted to address this increased injury rate trend for years (pers. obs.). Numerous solutions have been attempted based on good safety practices, and yet the trend of elevated injuries rates in U.S. land operations continues. Further, based on a review of the relevant literature, no scientific investigations were found that explored this phenomenon. In an anthropological case study of the Norwegian oil industry, Haukelid (2008) recounted the start of drilling activity in this sector as the *Texas* period, denoted by a culture of numerous accidents and risk taking. This period in the Norwegian sector of the North Sea lasted from 1966-1980 when a significant rig (Aleksander Kielland)

disaster forced the industry to progress to a higher level of safety awareness and activity (Haukelid, 2008).

The global nature of the industry, in many respects, forced most companies to move past this initial period of high risk-taking, so the elevated trend in U.S. land operations remains an enigma not studied by scholars. Even with a global industry, an easy leap to explaining the elevated injury rate is the potential differences in national cultures. In a comprehensive review of numerous aspects of cultural differences in more than 60 countries (i.e., GLOBE research), conducted by House et al. (2004), clear differences in national cultural characteristics were indentified. However, in a more recent study, Mearns and Yule (2009) reviewed the GLOBE implications for the global oil industry and found that management commitment and the effectiveness of safety measures had a greater role in safety outcomes than culture.

In a previous study of a regional sector of the oil and gas industry, Mearns, Rudmo, Flin, Gordon, and Fleming (2004) studied national culture implications for safety outcomes in the North Sea (United Kingdom; U.K. and Norwegian sectors) and found that the specific rig installation (leader) accounted for greater levels of variability in the results than did national culture. In a similar effort at North Sea installations, Høivik, Tharaldsen, Baste, and Moen (2009) found that the installation accounted for more of the variability than did the specific company employing the study participants. In short, the leader of the installation had a greater influence on safety outcomes than national culture. National culture may influence the elevated rate of injuries in U.S. land-based operations, but an overriding impact was not previously identified.

The intent of the current research project was to explore this elevated injury trend through a grounded theory methodology to develop an understanding of the influence of leadership in employee injury prevention or lack thereof in U.S. land-based operations. Previous studies conducted in the energy industry focused on safety climate as a predictor of safety performance and safety outcomes or, in other words, the employee injury rate (e.g., Haukelid, 2008; Høivik, Moen, Mearns, & Haukelid, 2009; Mearns & Reader, 2008; Mearns, Whitaker & Flin, 2001. Studies on safety climate conducted at oil field operations or in other industries identified various factors (e.g., management commitment, employee compliance and participation behavior, supervisor visibility and commitment to safety, and production demands) encompassing the construct of safety climate. Neal and Griffin (2002), Zohar (1980, 2001, 2008), Zohar and Luria (2005), and numerous others investigated the drivers behind good safety climate ultimately leading to good safety outcomes. As is more fully developed in chapter 2, researchers (Guldenmund, 2000; Mearns & Flin, 1999) frequently cited leadership as a key antecedent of good safety climate.

Safety climate, sometimes inappropriately used interchangeably with safety culture, has been described as the shared perception of policies (goals, organizational level), procedures (tactical, management level), and their implementation (tactical, supervisor level) at specific levels (e.g., Zohar, 1980, 2008). Safety climate is also described as strong or weak (according to the consensus level of employees) or high or low (Zohar & Luria, 2004). Over 30 years ago, Zohar (1980) determined a relationship between high or good safety climate and good safety outcomes. Many authors (e.g.,

Cooper, 2000; Mearns et al., 2003; Pousette, Larsson, & Törner, 2008; Zohar, 2001) credited the increased focus on safety culture and climate to the headline grabbing industrial accidents such as the Chernobyl nuclear reactor explosion in Russia where the investigating commission identified the lack of an appropriate safety culture as the root cause of the accident. Together with leadership and other antecedents of safety climate and safety performance, numerous productive research threads resulted in increased understanding of factors driving safety outcomes at various organizations (Guldenmund, 2007).

Background of the Study

Expecting to live through the workday is not a thought that even enters the consciousness of most people; employees take it for granted. Worrying about being injured is a far more common daily concern for employees in the energy extraction industry. According to the 2009 IADC statistical report (IADC, 2009), an individual working in U.S. land-based operations was more than 3 times as likely to be injured at work than a counterpart working offshore in the Gulf of Mexico and twice as likely to be injured than a colleague in Africa. If the employee works for a service company (an organization that provides various technical services to the energy company), he or she likely has the opportunity to work in all of these regions and in other geographies as well. Service companies presented a good model to investigate the phenomenon of increased injury rates in the U.S. as the nature of their business model entails service company employees conducting most of the hazardous work at a drilling or production operations exposing them to a variety of safety climates while working for different clients.

A U.S. land-based service company that has been in existence for over 100 years, has a broad array of operating locations, and has employees working in land-based drilling operations in the U.S. was selected for this study. This service company has various operations including drilling and evaluation programs, well completions, and production enhancing services. The products and services include drill bits, directional drilling and evaluation tools, well completion products, well logging services, production chemicals, and drilling fluids. The company typically manufactures products at owned facilities and further assembles or maintains equipment at smaller locations around the world. The company employs skilled trade people, machinists, basic labor, and highly educated professionals including research scientists and engineers.

While service companies employ a host of professionals ranging from accountants to physicists, the conditions for employees involved in providing direct field services to oil and gas companies can pose the greatest challenges for safety. Employees involved in field operations (i.e., drilling activities) are typically assigned to small bases around the country but often move from job (i.e., drilling site) to job without spending any time back at the home base. Job duties for employees include directional drilling and assessment, wireline operations, fluids and chemicals services, and other technical services such as installation of electrical pumps and down-hole equipment. Depending upon the specific job category, the employees can be at the rig site from several days to as long as a month. During drilling operations, fatigue easily can become a factor in injury causation, as 24-hour operations are common. On the production side, single employees can visit numerous well sites applying chemicals or maintaining equipment. In certain locations,

employees are able to return home at the end of their shifts, but working for multiple days is accepted practice. These employees face safety challenges on a daily basis and efforts to improve the understanding of safety performance and safety outcomes will serve this population with lifestyle or life critical benefits.

The service company involved in this research effort and most service and energy industry companies are keenly aware of the potentially hazardous conditions employees are exposed to and have developed many engineering improvements to eliminate or minimize the risks. Further, extensive training programs are in place to provide employees the knowledge and skills to recognize inherent job hazards and protect themselves from the existing risks. In the U.S., the Department of Labor through the Occupational Safety and Health Administration mandates a duty of care for an employer that includes engineering, training, and protective equipment requirements. Various trade associations such as the American Petroleum Institute, the IADC, the Petroleum Equipment Suppliers Association, the OGP, and professional societies such as the Society of Petroleum Engineers hold safety as a key focal point for their membership. Notwithstanding the significant effort on the part of the companies, the associations, and the government and despite improvements over the years, the U.S. industry has not been successful in eliminating workplace injuries nor in reducing them to levels lower than other regions of the world or in offshore environments.

The energy industry has an important role in the U.S. economy and workplace injuries are a significant concern for employees and society. Companies that occupy the service role for the operating companies (i.e., oil and gas companies) are typically

involved in the most hazardous aspects of the business. Consequently, a large U.S. service company was a good candidate to investigate the factors contributing to an elevated injury rate.

Statement of the Problem

The energy industry explores for oil and gas on a global scale, exposing employees to hazardous situations that can lead to injuries and sometimes death. Injury records kept by companies and trade associations have revealed a trend of an elevated injury rate in land-based operations in the U.S. relative to other geographic regions and even to offshore operations in the U.S. (e.g., Gulf of Mexico). There is a rich and varied literature investigating safety performance and safety outcomes in the energy industry (e.g., Haukelid, 2008; Mearns & Reader, 2008; Naevestad, 2008) and in other industries (e.g., Neal & Griffin, 2004; Zohar, 2008) specifically on the role of safety climate and the various antecedents (e.g., supervisor leadership style and visibilty, priority placed on safety over production, communication between organizational levels, employee involvement in safety activities, policies, and procedures) influencing safety climate and outcomes. The problem, however, is that no studies have focused on the elevated rate in U.S. land-based operations of the energy industry or on the role of leadership influencing these elevated rates. The lack of scholarly studies exploring the underlying factors leading to the elevated injury trend for U.S. land-based energy industry employees is an especially important gap in the body of knowledge as thousands of individuals are potentially subjected to injuries in this workplace.

Nature of the Study

The current study used a qualitative approach to explore the role of leadership in influencing the trend of elevated injury rates for employees working in the U.S. land-based operations at an oil field service company. Qualitative research was appropriate since the subject was not previously researched, the complexity of the topic did not lend itself to experimentation, and no definitive theories had been developed for testing (Corbin & Strauss, 2008; Creswell, 2007). Qualitative research also enabled a better understanding of the individuals and issues under study and was relevant to nonacademic audiences such as the energy industry for the current study (Corbin & Strauss, 2008.

A grounded theory (Glaser & Strauss, 1967) approach was used to study the current research question allowing me to develop knowledge inductively using the data obtained from the employees who are faced with living this situation of potential injury on a daily basis (Creswell, 2007; Leedy & Ormrod, 2009). Grounded theory is a method of developing theory from data systematically obtained from participants (Glaser & Strauss, 1967). Using grounded theory method allowed me to identify specific social processes influencing the safety performance of employees in U.S. land-based operations of the service company.

Specific details of the study methodology, following the grounded theory approach are presented in chapter 3. As a brief overview, data for the study were collected from study participants through structured interviews, both in person and via teleconference. Open-ended questions, focused around themes identified in the literature, guided the discussion. An interview guide was developed and used to provide an initial

structure to the interview process. Interview narratives were used as the raw data to code, categorize, constantly compare, and to identify and abstract themes leading to the development of a theoretical framework. Additional data included reflexive memos to identify and make personal impressions transparent, memos and field notes, and models providing a visual depiction of the themes.

Data collection and analysis was an iterative process and drove the ultimate direction of the study. As a measure of study verification, triangulation was used by allowing participants to review categories, themes, and the proposed framework to assess whether a faithful representation of their lived experiences resulted. Professional peers also provided assessments of the generated theories identifying their resonance for logic, practicality, and congruence to their professional experiences.

I targeted a study population consisting of a minimun of 10 employees and 10 first-line supervisors working in the field (generally land-based rig sites or repair and maintence facilities) in the U.S. for an oil field service company. Invitations to potential study participants yielded a total of 27 individuals (15 employee participants and 12 supervisor participants). These participants were identified as those assigned to U.S. land-based operations for at least 8 months of the past year. Company records were used to identify at least 100 individuals meeting these criteria and invitation letters were sent requesting their voluntary participation in the study consisting of a 1 hour interview near their base of operation or via telephone.

While the study population resided within the same company as the researcher, none of the potential participants was in the same department, structural organization, or

work site location. A potential population size of approximately 5000 employees exists and a minimum sample of 20 volunteers (employees and supervisors unmatched) was expected to be identified. While the interview data were kept confidential and results did not identify particular individuals, the nature of the study did not portend high-risk potential for participants. Energy industry employees frequently discuss safety topics such as those included in the proposed research interviews. Attempting to conduct this study in an external company would have led to difficulties in overcoming competitor business confidentiality.

Research Questions

This grounded theory study was guided and framed by the following research questions:

1. What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?
2. How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

Purpose of the Study

A comprehensive review of the safety literature indicated employee safety to be a topic of much interest and importance to scholars, practitioners, business leaders, government agencies, and nongovernmental organizations. Many scholars focused on industries considered highly hazardous as a means to exploring cause and effects of

employee injuries and as a means to developing interventions. Further, practitioners in the field spend entire careers dedicated to preventing employee injuries and searching for programs accepted by employees and management and achieving the goal of reducing injuries. The purpose of this study was to explore the role of leadership influencing a persistent trend in the energy industry related to an elevated injury rate among U.S. land-based employees relative to peers in U.S. offshore operations and other regions.

The goal of the research was to uncover the key drivers of this trend based upon the knowledge of factors (e.g., leadership style, employee motivation, levels of trust) shown to be important in fostering good safety performance and safety outcomes in previous investigations. Establishing the preliminary position of knowledge for this important problem was the first step in identifying potential solutions that could be empirically tested in future studies.

Conceptual Framework

This study explored leadership factors potentially influencing the increased injury rates of employees working for an energy service company in the U.S. relative to other geographic work sites. The investigation drew upon leadership theories primarily focused on the full range leadership model (Bass & Riggio, 2006), situational leadership theory (Hersey, Blanchard, & Johnson, 2008), and leader-member exchange (Graen & Uhl-Bien, 1995; Northouse, 2007) theory.

The focus on leadership as a potential driving factor for this elevated injury rate phenomenon was appropriate for several reasons. In a basic sense, the call for effective leadership is decades old (Bass, 1990) and continues to the present. Further, leadership

has been found by various scholars (e.g., Luria, 2008; Mullen & Kelloway, 2009; Zohar, 2003) to be directly and indirectly related to safety performance and safety outcomes. Neal and Griffin (2004) reviewed safety climate studies looking at both individual and organizational level antecedents and their results suggested the role of leadership was complex and needed improved understanding to enable reduction of employee injuries. Consequently, a number of authors have called for qualitative studies to improve the understanding of leadership influence and the importance of other factors in directing safety performance and ultimately resulting in good safety outcomes (Antonsen, 2009a, 2009b; Guldenmund, 2007; Zohar, 2001). Given the amount of time individuals spend at work, supervisors are an overwhelming influence on employees and logically affect their efforts.

The indirect effects of leadership on safety performance were also noted through its role of as an antecedent of safety climate, a construct that generally measures the perceptions of employees to safety policies and procedures, their implementation and the relative to the priority given to safety over production or other business goals (Zohar, 2008; Zohar & Luria, 2005). The safety climate literature is rich but varied in focus and often concerned with simply measuring the current climate of the organization (Guldenmund, 2007). In the current investigation, I searched for key aspects of safety climate that were or could be important drivers for safety within U.S. land-based operations of the service company.

Definitions

The following terms of art or professional jargon are used throughout the chapters and are defined in this section to provide operational clarity.

Days away from work case or lost time rate: a mathematical summation of all lost time injuries suffered by relevant employees divided by the total number of hours worked by the relevant employees multiplied by 200,000 to standardize the rate to one lost time injury per 100 employees.

Employee voice: providing voluntary information to management in order to improve conditions at the workplace (Detert & Burris, 2007).

First aid injury: a minor injury that does not require medical treatment or prescription medication (e.g., a minor cut treated with over the counter antiseptics and band-aids). These types of injuries were termed micro-accidents by Zohar (2000).

Incident management system: pseudonym given to describe the company software system to capture, record and trend incident and near miss information.

Hand: an oil field slang term for employee.

Incident: an unplanned and undesired event that results in a loss or could have resulted in a loss under slightly different circumstances.

Injury rate: a general metric for assessing the frequency of occupational injuries by calculating the number of specific types of workplace injuries per the number of work hours and normalized to injuries per 100 employees to allow comparisons between different employee population sizes. The U.S. Occupational Safety and Health Administration descriptions of injuries and rates are used in this study and generally

within the energy industry making them a good method for comparing companies and results in different geographies. The keystone terms encompassing injury rate are total recordable injury rate, restricted duty case rate, and days away from work case rate.

Loss: defined as the unnecessary waste of resources, including people (e.g., through fatality, injury, illness), plant/equipment (e.g., through damage, repairs, replacement), process (e.g., through interruption), amenity (e.g., through environmental pollution), or reputation (e.g., through adverse publicity).

Personal protective equipment (PPE): equipment worn by employees to protect against workplace hazards. Examples include safety glasses, steel-toed shoes, gloves, etc.

Recordable injury: a recordable injury is a work-related episode that requires the employee to receive medical treatment (e.g., stitches to a cut) beyond first aid, but allows the employee to return to work once treatment is administered.

Safety climate: a snapshot measurement of employees' perceptions about the status and importance of safety within an organization (e.g., the policies, procedures, and practices), and their attitudes and beliefs related to behaving and acting safely or taking risks (Griffin & Neal, 2000; Mearns & Flin, 1999). Safety climate is a manifestation of the safety culture of the organization (Mearns, Whitaker, & Flin, 2001). Measurements are typically reflective of a specified group, but composed of aggregated individual assessments.

Safety climate level: the aggregated group members' rating of the safety climate perception items (Zohar, 2001, 2008; Zohar & Tenne-Gazit, 2008).

Safety climate strength: the consensus of the individual safety climate perceptions measured for the group (Zohar, 2001, 2008; Zohar & Tenne-Gazit, 2008).

Safety culture: describes the shared perceptions and attitudes related to the importance of safety (Cooper, 2000; Guldenmund, 2000). Culture was also described by Glendon & Stanton (2000) to have depth, at the surface are the visible manifestations (e.g., statements, meetings, PPE use), a middle layer includes the espoused values and the deeper layer of the basic assumptions regarding the nature and reality of truth, time, space, human nature, activity, and relationship.

Safety compliance: the core or required safety activities that must be accomplished to maintain system safety (Griffin & Neal, 2000).

Safety outcomes: a measure of an organization's success in preventing injuries. The measure typically used is an injury or incident (includes occupational illnesses) rate (Burke, Chan-Serafin, Salvador, Smith, & Sarpy, 2008).

Safety participation: engaging in voluntary activities related to improving system safety (Griffin & Neal, 2000).

Safety performance: defined as the level of safety compliance and safety participation by Clarke (2006), determined by employees' knowledge levels, skill, and motivation (Griffin & Neal, 2000). However, safety practitioners and other researchers (e.g., Mearns & Reader, 2008) tend to use the term as a level of occupational injuries (which type of injuries is rarely specified) denoting good (low levels of injuries) or poor (high levels of injuries) performance. In this study, safety outcome was used as the term describing injury occurrence performance.

Safety specific transformational leadership: behaviors exhibited by leaders that promote safety. For example, concern for safety and well-being of employees (individualized behavior), communicating a vision of workplace safety (idealized influence), challenging employees to achieve exceptional safety performance (inspirational motivation), and encouraging employees to solve safety problems (intellectual stimulation; Barling, Loughlin, & Kelloway, 2002; Mullen & Kelloway, 2009).

Significant near miss event: an incident not resulting in injury, death, or property or environmental damage, but could have resulted in these foreseeable serious consequences given slightly different circumstances.

Total recordable injury rate (TRIR): TRIR is a mathematical summations of all medical treatment beyond first aid cases, restricted duty cases, and days away from work cases for relevant employees, dividing this figure by the number of hours worked by the relevant employees and multiplying by 200,000 to standardize the rate to one recordable injury per 100 employees.

Training system: a pseudonym used to describe the company software system that contains training modules and a recordkeeping system of attendance.

Assumptions

The purpose of this study was to investigate the influence of leadership on elevated employee occupational injury rate trend. Specifically, in U.S. land-based operations, employee injury rates are 3 times higher than comparable situations in U.S. offshore operations and Canadian land-based operations (IADC, 2009). The reason(s) for

this elevated rate were assumed to be complex and had not been subjected to previous academic research. In this exploratory investigation of the problem, I assumed individuals experiencing the work situations and facing hazardous conditions daily were well placed to provide data leading to the generation of theories. Further, I assumed those individuals volunteering to participate in this study were candid, forthcoming with their responses to the interview questions, and willing to review material to assess developed theories. I also assumed the participants were honest in their replies and shared a goal of identifying pertinent data necessary to develop substantive theories using the grounded theory method. Each participant was encouraged to be candid and assured confidentiality.

Related to the knowledge of the participants, I assumed study volunteers to had a basic understanding of safety and the expectations of the company related to employees actions, but the participants were not assumed experts in the field of safety or leadership. I also assumed that each participant had a relationship with a supervisor within the company and communicated with this supervisor with some level of frequency.

Scope Delimitations

This investigation included boundaries that limited the scope and generalizability of the results. The overriding boundary included the selection of a single U.S. based service company with a large employee base in the U.S., but also with employees working in 90 countries. The study took place during 2010 and only included participants working within relevant states (i.e., oil and gas producing) for at least 8

months of the last year. I attempted to select volunteers with longer work tenures in U.S. land-based operations.

I targeted the study sample to include a minimum of 20 participants, but concluded the study with 27 participants based on the number of individuals responding to the study invitations. While the proposed methodology is described in chapter 3, a grounded theory study required me to remain open to unexpected turns in the process and allow the emergent data to potentially drive the effort in unplanned directions.

The focus of the study was delimited to factors that influenced the elevated injury in the land-based operations of the energy service company. Factors primarily included leadership, management commitment, safety versus production priority, employee safety performance and motivation, participation and compliance, and communication as described by the participants. This study did not address the influence of personality characteristics on the observed injury rate trend. Further, the study did not address the role of society, community, or regulatory factors influencing injury trends. Nevertheless, grounded theory methodology did not lend itself to identifying all the important factors before the research began and additional factors were included as the participants introduced them.

Limitations

I endeavored to conduct a scholarly investigation with integrity and high standards; however, as with all social research, the study has limitations. First, since I am a practitioner in the health, safety, and environmental (HS&E) field, a potential for bias existed which could have influenced the interpretations of the findings. This potential

bias extended to strong indications in the research literature regarding the importance of leadership in driving safety performance and safety outcomes. Contrary to the direction provided by Glaser and Strauss (1967), in which these scholars encourage researchers not to delve to deeply into the literature prior to beginning the research project, the nature of the dissertation process is to become very knowledgeable of the existing literature.

To address the limitation of potential bias, several mechanisms such as data triangulation, extensive time in the field, and participant and peer reviews were used. Additionally, during the research phase, memoing was used to surface potential biases and make transparent the mental dialogue with the collected data. Participant checking was used to determine accuracy of the identified themes. A pool of professional colleagues was also accessed to provide another check of the developing framework for real-world applicability and sensemaking.

Participant selection in a qualitative study is not intended to follow criteria for randomness; however, the initial candidate pool was selected based on general criteria without regard to participant knowledge of good safety performance characteristics. Time in the field was limited, and some participants were not able to fully explain their situation or in some cases be cognizant of the nuances related to safety requirements. I explained the intent of the project to each participant and balanced the amount of time available in the field with the need to saturate categories and look for negative cases.

Significance of Study

This study is significant because it first served to identify an important and long-standing gap in the literature, namely the lack of scholarly investigations into the cause of

the elevated trend of employee injuries in the U.S. land-based operations of the energy industry versus other regions. Occupational injuries are a significant concern for businesses, governments, nongovernmental organizations, and most especially employees. Safety performance and safety outcomes, studied within various industries, was found to be influenced by a complex variety of factors such as supervisor leadership style and visibility, priority placed on safety over production, the level of communication between supervisors and employees, etc. This grounded theory study explored the role of leadership in influencing the differential (higher) injury rates of employees working in land-based operations of an energy services company in the U.S. Scholars have reported leadership to be one of the key attributes driving safety performance in previous studies and this construct served as a good starting point for this investigation (e.g., Luria, 2008; Mullen & Kelloway, 2009; Zohar & Luria, 2003).

Answering the research question through data obtained from employees living the experience led to the potential factors, leadership driven and otherwise, preventing a safer work environment for employees. The effort contributed to positive social change in providing employees a voice in the situation and elucidating good and poor existing practices. This effort led to testable theories enabling further research to generate an important body of knowledge and ideas for practitioners to use in reducing injuries and fatalities in this industry.

Summary

This chapter introduced the study of the influence of leadership on the elevated injury rates in U.S. land-based operations of an energy industry service company. A brief

overview of the background and the problem statement led to the statement of the research questions. The conceptual framework of the investigation centered on theories of leadership as numerous previous studies indicated the strong influence of leadership on safety performance and safety outcomes. Significantly, none of these studies addressed the trend observed in the energy industry injury rates in U.S. land-based operations. As this investigation was an initial look at this problem, a qualitative (grounded theory method) study was used to explore the research questions.

The following chapter provides a review of the literature focusing on applicable aspects of leadership, safety climate, and culture studies, and the antecedents of safety performance and safety outcomes. Chapter 3 presents the methodology and procedures used in this investigation, highlighting the grounded theory approach, the interview questions, and participant selection. The succeeding chapter presents the results of the investigation and the framework developed from the participant information. Chapter 5 includes a synthesis of the literature review and the results of the current study to identify key themes in understanding and answering the research questions. Based upon the identified theories, recommendations for future study and directions for practitioners to take in working to test identified theories or begin to put in place actions that will serve to minimize the employee injury rates in land-based operations are provided that chapter.

Chapter 2: Literature Review

Introduction

Few if any employees, supervisors, or managers would state they want to injure themselves or anyone around them, yet every day, occupational injuries occur. The prevention of these injuries has occupied scholars and practitioners for decades and they have identified many factors important in influencing safe behavior, but the trend continues. One concerning trend within the oil and gas industry is the disparate level of injuries to employees working in U.S. land-based operations relative to any other region of the world or even versus offshore operations in the Gulf of Mexico. The 2009 IADC statistical report (IADC, 2010) identified injury trends more than 3 times higher in U.S. land-based versus U.S. offshore operations. No scholarly research was found investigating this trend, but many scholars have investigated the drivers of good safety outcomes with the leaders' influence often being cited (e.g., Guldenmund, 2000; Howell & Hall-Merenda, 1999; Kelloway, Mullen, & Francis, 2006; Mullen & Kelloway, 2009). This research effort explored the aspects of leadership style described by employees and supervisors as important while discussing safety outcomes. Further, the work probed how various types of leadership actions manifested in the U.S. land-based operations of an energy service company.

The purpose of this grounded theory study was to explore a persistent elevated injury trend among U.S. land-based employees in an energy industry service company representative of the industry. The overall goal of the research was to uncover the key drivers of this trend based upon investigation of factors (e.g., leadership style, employee

motivation, safety knowledge) shown to be important in fostering good safety performance and outcomes in previous investigations. Establishing the preliminary position of knowledge for this important problem was the first step in identifying potential solutions, that can be tested in future studies.

The focus of this chapter is on reviewing and analyzing the current state of research related to understanding the antecedents driving good or poor safety outcomes, specifically low or high injury rates. This broad search for relevant research was important to defining the base of potential factors needed in order to facilitate developing theories examining the causes of the elevated injury trend in U.S. land-based operations in the oil and gas industry. This grounded theory study was guided and framed by the following research questions:

1. What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?
2. How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

Preparing this literature review required a broad foray into the safety literature as scholars had taken various routes researching drivers of good safety outcomes. Scholars studied occupational safety by identifying various mediators, moderators, or simply antecedents, but the field has not been well organized (Christian, Bradley, Wallace, & Burke, 2009) despite several attempts at consolidation (Guldenmund, 2000; Mearns &

Flin, 1999). I tackled the review by using a variety of sources including scholarly books providing foundational knowledge, peer-reviewed articles documenting the current state of the situation, relevant dissertations to determine previous approaches, and industry databases to document the existence of the problem.

As a starting point, I used two journals, *Safety Science* and the *Journal of Safety Research*, relevant to the safety profession to assess the important researchers in the field. The journal, *Leadership Quarterly*, was used as a source for leadership research and each issue in these three journals was reviewed for the past 5 years for relevant articles. Very quickly, key researchers emerged (e.g., Barling, Flin, Mearns, and Zohar), and online databases were searched for articles authored by these scholars. Additionally, a systematic search of the electronic databases (e.g., EBSCO Host, Sage, and Proquest) was conducted to access additional articles. Key search words included *safety*, *safety leadership*, *leadership*, *transformational leadership*, *safety climate*, *safety culture*, *culture*, *national culture*, *safety-related trust*, *trust*, *safety training*, *safety knowledge*, *injury (ies)*, *occupational injuries*, *safety performance*, *leader-member exchange*, *safety behaviors*, and *accidents*. Lastly, references in each of the obtained articles were reviewed, assessed for relevance, and full papers obtained for further review.

This literature review assesses key leadership theories related to research on safety outcomes, aspects of leadership including trust, decision-making, and key antecedents of safety outcomes including safety culture, safety climate, elements of safety performance, and factors leading to successful safety outcomes.

Influences of Good Safety Outcomes: Overview

In a recent meta-analysis of the safety literature, Christian et al. (2009) provided a clear summary model of distal and proximal antecedents driving good safety outcomes. While each antecedent identified by Christian et al. potentially plays a role in the prevention or increase of injuries, this research effort was focused on the role leaders and leadership plays in this complex phenomenon. However, leadership alone is not a guarantee of safety outcome success as even transformational leadership without a meaningful work environment, and role clarity were not sufficient to influence employee well-being (Nielsen, Randall, Yarke, & Brenner 2008). Consequently, I was open to collecting other potential influences of safety outcomes during the field research portion of this study.

Even though Christian et al. (2009) listed leadership as a distal antecedent of occupational safety, a case for leaders influencing a number of other antecedent, both positively and negatively can easily be made and has been studied (e.g., Mullen & Kelloway, 2009). Luria (2008) investigated the relationship between climate strength, transformational leadership, and group interaction (cohesion) and found that leaders created climate while their communication style created consensus of the climate within the workgroup (Zohar, 2002a; Zohar & Luria, 2004), likely through a sensemaking process. Cohesion and transformational leadership had an additive effect on climate strength and group cohesion moderated the negative influence of passive leadership (Zohar and Luria, 2004). Alternatively, climate consensus developed through the social interactions of a group (Gonzalez-Roma et al. as cited by Luria, 2008). These findings

are supported by a longitudinal study completed by Pousette et al. (2008) in the Swedish construction industry where the worst circumstance for safety outcomes was poor or no leadership and no cohesion. According to Weick (1995), collective sensemaking is an important process helping individuals understand the situation or expectation when messages are mixed or vague. Conditions such as the lack of leadership, mixed messages, or no group-created cohesion are important to identify when studying safety outcomes and can occur in situations where employees are working alone as occurs in some land-based operations.

The model proposed by Christian et al. (2009) provided a good framework to investigate safety and differential outcomes in the U.S. land-based operations of the service company that was the focal point of this study. Distal (e.g., leadership, climate, personality traits) and proximal factors (e.g., motivation, knowledge), except personality traits, were considered in the current study in addition to the other potential routes such as trust which had been identified as an antecedent of good leadership (Dirks & Ferrin, 2002; Schoorman, Mayer, & Davis, 2007).

Leadership Theories and Influence on Safety Outcomes

There are many models or theories of leadership ranging from trait to process to relationship based theories (Northhouse, 2007). Many of these would shed light on the leader's influence on safety outcomes; however, this review was limited to the full range leadership model, situational leadership, and leader-member exchange theories that were mainly associated with investigations of safety outcomes in the literature.

Full Range Leadership Model

Leaders play an important role in influencing the behaviors of employees, even beyond the formal power relationship; they create sensegiving messages, and the context in which certain activities and behaviors are rewarded (Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005). When the context includes a priority on safety, appropriate values and safe behaviors follow (Hofmann & Morgeson, 2004). Transformational leadership has been well studied and found to be beneficial by a number of authors (Bass & Riggio, 2006) and used to explain phenomena such as variations in safety outcomes (Barling, Loughlin, & Kelloway, 2002; Kelloway, et al., 2006; Mullen & Kelloway, 2009). Bass and Riggio identified a continuum of styles from most active (transformational) to least active (e.g., laissez-faire) in their full range leadership model. Safety researchers have used most aspects of this model to investigate the link between safety performance (and its antecedents) and safety outcomes.

A review of the current safety research related to each level within the full range leadership model provides a flavor for the variety of approaches in the field. The full range leadership model is bounded by the extremes of transformational and laissez-faire styles with contingent reward and active and passive management by exception falling in the mid-range of effectiveness and activity (Bass & Riggio, 2006). Starting with the inactive range of the model, laissez-faire or the absence of leadership has been found to be negatively correlated to performance in general (Bass, Avolio, & Jung, 2003; Zohar, 2002a) and when examined in relation to safety outcomes (Kelloway et al., 2006; Luria, 2008).

Laissez-faire leadership was not only ineffective in producing good safety outcomes; it was detrimental to employee well-being (Kelloway et al., 2006). More concerning, safety related passive leadership was observed as a possible hidden leadership characteristic causing increased employee injuries, as most managers would not directly suggest their employees act unsafely. Instead, silence or inaction on the leader's part indicates the low priority of safety and indirectly results in unsafe behaviors (Kelloway et al., 2006). Speaking about and for safety is necessary to create the sensegiving message that safety is a priority.

Leaders' sensegiving messages are important because safety climate was mediated by leadership styles especially when leaders provided employees large amounts of data feeding the sensemaking process and supporting employee voice (Zohar & Luria, 2004). A production orientated transformational, but safety passive leader, would create the sensegiving message that safety was not important (i.e., priority of production over safety) and the consequences of this position such as increased injuries would tend to follow (Mearns et al., 2003; Mullen & Kelloway, 2006). Leaders needed to be safety champions; simply being quiet led to negative consequences (Kelloway et al., 2006) as the mixed messages resulted in a reduction of safety focus by employees. In these instances, the workgroup could be a valuable alternative sensemaking mechanism if members were supportive of safety (Zohar & Tenne-Garzit, 2008).

Managers and leaders speaking up for safety are important; however, employees' willingness to speak up and identify safety issues to managers is just as critical. This iterative process, specifically employee voice and managerial openness to change, had

the greatest influence on positive use of employee voice; even more than leadership qualities alone (Detert & Burris, 2007; Mullen, 2005; Thompson, Hilton, & Witt, 1998). Nonetheless, the use of voice carried potential consequences to employees such as image risk (i.e., being seen as tough or not) and job security if managers were not willing to hear the information (Liu, Zhu, & Yang, 2010). Employees could be dissuaded from providing information, even when the manager was open to hearing the information, if no action was taken to address the issues (Griffin & Neal, 2000; Mullen, 2004, 2005). Consequently, active leadership, without safety leadership may not be enough to encourage employees to speak out about safety resulting in an unfavorable spiral towards poor safety outcomes (Hofmann & Morgeson, 1999).

Moving higher on the scale of inactive to active leadership, two subgroups of management by exception are characterized as the leader waiting until problems occur in order to correct the follower's behaviors (passive) and the active mode of management by exception where the leader monitors the employee's efforts and provides correction when a nonconforming activity occurs (Bass & Riggio, 2006). Specific to management by exception (passive), Howell and Hall-Merenda (1999) identified a demoralizing effect on employee performance resulting from constant reprimands, which in light of results indicating the importance of motivation to safety behavior (e.g., Mearns & Reader, 2008) calls into question the effectiveness of this style in improving safety outcomes. If the only time managers discuss safety, they reprimand employees, a negative dynamic for future safety participation and employee voice is created. Only a few studies were

located focusing on this type of leadership style, but the results were consistent in revealing it as an unproductive approach.

Contingent reward (transactional) leadership entails a leader assigning tasks (or obtaining agreements) and providing rewards based on the completion of the tasks (Bass & Riggio, 2006). Zohar and Luria (2003) tested transactional leadership relative to improved safety behaviors and found that supervisors could positively influence employee behaviors under circumstance of routine activities. Environmental factors such as routine or novel operations can drive positive safety outcomes when the situation was appropriate to a specific style (Howell as cited by Bass & Riggio, 2006). For example, transactional leadership was successful in routine situations, but transformational leadership was required to encourage employees to develop novel solutions to unanticipated problem (Zohar, 2003). O'Shea, Foti, and Hauenstein (2009) found in a hospital setting that the most effective leaders used a combination of high transformational and transactional leadership and low passive management by exception styles indicating a split between routine and novel situations experienced by hospital staffs.

In an important identification of a multilevel influence of leadership styles, Zohar (2002a) found the priorities of higher levels of management influenced the supervisor's safety practices to a greater degree if the supervisor had a transactional versus a transformational leadership style. Specifically, transactional supervisors were more highly influenced by the production priorities of their managers than were transformational supervisors. The supervisor/employee dyadic relationship in this

multilevel investigation also indicated that employees' safety behaviors (e.g., risk taking) were influenced by the employees' perceptions of fairness by the supervisor and their commitment to safety as perceived by their (i.e., supervisors) involvement in safety-related activities (Yule & Flin, 2007). These studies indicated the influence of leadership on safety outcomes should be examined at several levels.

Transformational leadership style falls at the highest end of the active and effective scale of the full range leadership model and is divided into four separate components (Bass & Riggio, 2006). These components include idealized influence where leaders exhibit positive behaviors and serve as role models for employees; inspirational motivation where leaders exhibit motivating behavior by encouraging employees to achieve greater outcomes; intellectual stimulation where leaders encourage creativity by questioning assumptions, reframing problems, and encouraging new approaches from the followers; and fourth, leaders exhibiting individualized consideration are sensitive to the specific needs of individuals tailoring their efforts to meet these needs. Under the full range leadership model, effective leaders adjust their style to the appropriate situation and use all styles as necessary (Bass & Riggio, 2006). In this vein, the full range leadership model is similar to expectations in the situational leadership model (Hersey et al., 2008).

Barling et al. (2002) linked the four components of transformational leadership to a safety specific lens. For example, individualized concern was demonstrated when leaders engaged and demonstrated their personal concern for employee safety and well-being. Leaders emulating idealized influence communicated a vision of workplace safety

and modeled appropriate behaviors by promoting working safely, rather than primarily focusing on production. Leaders challenged individuals to exhibit high levels of safety behaviors through inspirational motivation and the development of novel solutions to non-routine situations through intellectual stimulation activities.

Barling et al. (2002) demonstrated the positive influence of safety specific transformational leadership on safety outcomes in a study of Canadian restaurant employees and new employees in a variety of industries. The authors investigated several of the distal situational antecedents indentified in the Christian et al. (2009) model and supported the additional relationship of leadership and safety-climate directly and as a distal factor. Mullen and Kelloway (2009) investigated the effects of transformational and safety specific transformational leadership on safety outcomes in a pretest, posttest design in the long-term health care setting. Safety specific transformational leaders (versus transformational leaders, which were not different from the control group) had the highest safety attitudes, intentions to promote safety, and self-efficacy. Employee perceptions of climate were higher for safety specific transformational leaders and these groups reported lower injury levels (i.e., better safety outcomes).

In a study focused on the influence of supervisory guidance and integrity, Dineen, Lewicki, and Tomlinson (2006) found these aspects encouraged organizational citizenship behavior (OCB, similar to safety citizenship behavior) and reduced deviant behavior. They defined supervisory guidance (individualized consideration and intellectual stimulation) as the level of instruction regarding positive behavior and the avoidance of negative behavior, while behavioral integrity (idealized influence and

inspirational motivation) described the alignment between the supervisor's instructions and the employees' behavior regarding the instructions. Dineen et al. found that supervisory guidance alone did not influence OCB or deviant behavior, but behavioral integrity was proportionately related to OCB and inversely related to deviant behavior. Lack of behavioral integrity led to decreased OCB and increased deviant behavior. The combination of supervisory guidance and behavioral integrity showed the strongest correlation to increasing OCB and decreasing deviant behavior.

The study conducted by Dineen et al. (2006) illustrated the point of the common business slang of "walk the talk"; if supervisors want employees to follow rules and engage in the voluntary safety activities, they not only have to follow the rules themselves, but they also have to participate in voluntary safety activities. A similar result was determined in a study by Babcock-Roberson and Strickland (2010) specifically focusing on charismatic leadership where leader engagement was related to OCB in study participants.

An emerging direction for safety related transformational leadership research is the influence of context on the effectiveness of this style. Several authors identified situational influences, for example, stable versus novel environments as reflecting the relative success of transactional versus transformational styles (e.g., O'Dea & Flin, 2001; Zohar, 2003). Cole, Bruch, and Shamir, (2009) identified social distance, defined as the hierarchical distance between leaders and followers, as a moderator between transformational leadership and safety outcomes. They found that high social distance (e.g., vice president to shop floor employee) reduced the leader's influence on employee

modeling of leader behavior, but enhanced the perception of climate and collective efficacy. A close relationship with the leader may enhance the employee's ability to emulate a transformational leadership style (e.g., supervisor/manager) while some distance is needed to ascribe greater importance to inspirational and visional aspirations (e.g., supervisor/vice president). If transformational leadership and more directly, safety specific transformational leadership is desired by a company, encouraging close relationships (i.e., increasing the span of transformational leadership in the organization) could be a possible intervention.

As another dimension of distance, specifically physical distance between leaders and employees, which is a common situation in many companies, may create circumstances where emulating transformational leadership is impossible thereby minimizing benefits of this leadership style (Howell & Hall-Merenda, 1999). Howell and Hall-Merenda found that transformational leaders had higher performance ratings from physically close employees while leaders with high relationships had good performance regardless of the distance. In a recent study by Neufeld, Wan, and Fang (2010), the authors found that distance was not a barrier to effective communication or performance, but speculated that an existing close relationship between leaders and followers may have influenced the results.

However, other studies (Luria, Zohar, & Erev, 2008; Zohar, 2003) have shown that visibility or physical closeness were important indicators of good safety outcomes. They recognized that supervisors drove safe behaviors when they were able to provide appropriate feedback on the importance of safety to employees. These findings imply

that transformational leaders may need the physical closeness to assess accurately the individual needs of their followers and to encourage and motivate them with the mission and vision while leaders with overall good relationships either have established this knowledge or the good relationships minimize any negative impact.

While limited in number, taken together, these studies suggest a concern for organizations where employees are remote from direct supervisors such that their behaviors are rarely monitored. Importantly, work groups remote from their leaders are common in the U.S. land-based energy service sector and these leaders may have to overcome this lack of visibility by making planned visits to speak with employees or using other mechanisms for communication. In a recent experiment, Ruggieri (2009) investigated the success of transformational and transactional leaders related to the aspect of distance to determine the relative satisfaction in a virtual situation (computer-mediated communication). In this scenario, participants preferred the transformational leader and style. This study holds an interesting thought for the U.S. land-based energy service company employees as much if not all communication in some circumstances between employees and supervisors can be accomplished through email and telephone communications options.

Situational Leadership

Situational leadership theory predicts that effective leaders can diagnose a situation and use an appropriate style (i.e., delegating, participating, selling, and telling) to deliver desired results (Hersey et al., 2008). Employees' performance readiness for a particular leadership style is based upon their ability (demonstrated knowledge, skill, and

experience to complete a task) and willingness (level of confidence, commitment, and motivation to complete the task) phase. One of the key expectations for successful leadership under the situational leadership model is the ability of the leader to be style flexible although Hersey et al. acknowledged that most leaders have a primary style (i.e., whether telling, selling, participating or delegating) and a secondary style. The leader's style range defined the extent to which all four styles were exhibited and leaders with little flexibility would typically be effective if their style matched the environment and the environment was stable (Hersey et al., 2008).

At a basic level, situational leadership can be linked to the ability to lead during routine or crisis situations related to safety outcomes. In an early investigation of leadership style and injury occurrence on naval ships, Butler and Jones (1979) found that leaders with a directive style were more successful in hazardous situations when the employees had little experience. This style was ineffective during non-routine situations where the individuals had to develop novel solutions to uncommon problems. When employees had a lot of experience, tasks were routine or well established, and rewards were linked to safe behaviors, leadership had less influence on safety performance. However, when any of those conditions were not in place, leadership importance increased (Hofmann & Morgeson, 2004).

O'Dea and Flin (2001) investigated aspects of situational leadership at offshore installations in the North Sea related to manager experience levels. Through survey interviews they determined an almost even split between the telling (31%), selling (26%), consulting (21%), and participative (22%) styles. The telling and selling styles (more

than half of the managers surveyed) characterized authoritarian leadership; these managers most often attributed accidents to the employee and claimed difficulty in motivating employees to act safely (O'Dea & Flin, 2001). When these managers were asked about best leadership practices, several themes emerged including visibility and proactive role modeling, high quality relationships, good communication, and workforce involvement and empowerment. Further, the majority of the managers indicated that a participating style that built trusting relationships would be the best practice to improve employee safety results (O'Dea & Flin, 2001). The authors identified an interesting disconnect between espoused theories and theories in use (Argyris, 1992), but they did not relate leadership style to safety outcomes in this study. If this disconnect similarly exists in U.S. land-based operations, then an appropriate intervention related to leadership training could be implemented.

Related to situational leadership is the construct of situational awareness, which describes the level of attentiveness and vigilance to the current circumstance and environment. This construct has not been extensively studied, but Sneddon, Mearns, and Flin (2006) conducted a qualitative study investigating the role of situational awareness in injuries at offshore oil and gas installations. They found that most errors resulted from a lack of perception or monitoring of the environment, lack of comprehension of the circumstances, and a failure to foresee the potential outcome of the environmental circumstances. The most common reasons identified for the lack of situational awareness were events at home distracting the employee, fatigue, and stress. Study participants described a physical change in co-workers when they were not situationally aware and

the awareness of coworkers to this change was proposed as a key to addressing this situation.

Unfortunately, in the energy industry, crew changes and sequential work efforts by different contractors lead to a lack of knowledge of employees' situational awareness physical cues. In other words, if the newly arriving employees are strangers, the physical cues indicating a lack of situational awareness will be unknown to the existing employees. Burt and Steveson (2009) also confirmed the importance of situational awareness on injury levels in a study of new employees joining a work crew. New employees needed to achieve a level of familiarity of the situation before their presence ceased to influence injury levels. In U.S. land-based operations, crew changes may be so frequent that a lack of situational awareness is seldom recognized. Not only must the managers lead in a manner appropriate to the situation, but employees might also be important conduits to identifying when other employees put themselves and others at greater risk as a result of not being situationally aware.

Leader-Member Exchange

Leader-member exchange relationships were also identified in the safety literature as a means of studying drivers of safety outcomes. This theory focuses on the dyadic interaction between the leader and the follower (Northouse, 2007) creating a useful framework for investigating the factors influencing employee safety performance as supervisors and managers have been shown in climate studies to have a large influence on employee behaviors (e.g., Hofmann, Morgeson, & Gerras, 2003; Zohar, 2002b; Zohar and Luria, 2003). As developed by Graen and Uhl-Bien (1995), this leadership theory

described two types of linkages between leaders and followers, the in-group and the out-group. The in-group was based on good relationships resulting in followers exceeding formal work expectations while the out-group described a formal work relationship resulting in followers simply adhering to the basic work requirements (e.g., as spelled out by a union contract). The theory implied that employees would be motivated to become part of the in-group and provide additional effort to help achieve work group goals such as reduced injury levels by participating in voluntary safety related activities.

The impacts of in-group versus out-group relationships were very similar to the components of employee safety performance described by Neal and Griffin (2002, 2004) in their identification of safety outcome drivers, namely basic compliance and voluntary participation. Compliance evoked rule following (out-group), while participation not only included rule following, but also going beyond compliance by helping making the workplace safer for all employees (e.g., participating on safety committees, and submitting observations of issues requiring attention). High leader-member exchange relationships were found to increase communication (i.e., employee voice) between supervisors and employees and the employees' willingness to participate in safety activities (Hofmann & Morgeson, 1999; Ilies, Nahrgang, & Morgeson, 2007; Kath, Marks, & Ranney, 2010; Kelloway et al., 2006; Mearns & Reader; 2008; Michael, Guo, Wiedenbeck & Ray, 2006).

Further, when organizational needs presented employees with conflict in terms of competing priorities involving production and safety, high quality leader-member exchange relationships resulted in a collaborative problem solving process; this process

failed to develop in low quality relationships (Hofmann et al., 2003). However, high leader-member exchange relationships were not always enough to ensure safety participation especially when a lack of manager commitment to safety existed (Hofmann et al., 2003). Similar to the finding of the need for safety specific transformational leadership driving good safety outcomes, simply having a good relationship (in-group member) was not enough to generate positive safety outcomes if the supervisor or manager was silent on the importance of safety (Detert & Burris, 2007; Hofmann et al., 2003; Mullen, 2005).

The preceding survey of key leadership theories and safety research related to particular theories served as an overview to the variety of avenues taken by researchers. Leadership appeared to play an important role in safety outcomes. Recently, the research focus has turned to aspects of the full range leadership model (Lu & Yang, 2010) leadership styles and the degrees of influence different types of leader attributes have on employee safety behavior and safety outcomes (Barling et al., 2002; Kelloway et al., 2006; Mullen & Kelloway, 2009). Aspects of transformational leadership have been empirically related to positive safety outcomes (Lu & Yang, 2010; Mullen & Kelloway, 2009; Zohar, 2002a; Zohar & Luria, 2004) commonly attributed to the success of this style in rapidly changing environments (Bass & Riggio, 2006). Consequently, transactional leaders exhibiting constant approaches to all situations might prove highly effective under routine conditions, but ineffective in highly variable or complex situations (Butler & Jones, 1979; Hofmann & Morgeson, 2004; Zohar & Luria, 2004). Given the rapid pace of change in the business world, transactional leaders may become less

effective related to safety outcomes in many instances. A few studies have also appeared investigating additional variables making transformational leadership more context-specific, specifically investigations of safety specific transformational leadership and trust facets. While the existing body of knowledge provides insight to the importance of leadership, research is needed on the mechanisms of leadership that promote good safety results (Zohar, 2010). The construct of trust, as an aspect of leadership, was reviewed as a potential important influence on safety outcomes.

Influence of Trust on Leadership and Safety Results

The construct of trust has been studied relative to its importance in leadership theories (Dirks & Ferrin, 2002) and has recently become a focal point for work place safety research in relation to leaders' impact on safety. Rousseau et al. (as cited by Dirks & Ferrin, 2002) provided a generally referenced definition of trust as "…a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (p. 612). Christian et al. (2009) did not include trust in their safety outcome model, but the construct warrants consideration for the current study as the influence of trust on various antecedents (e.g., leader-follower relationships, safety participation, and management commitment) may be revealed as a factor in workplace injuries in U.S. land-based energy service operations.

Lewicki and Bunker (as cited by Clark & Payne, 2006) identified three levels of trust: calculus (consistency), knowledge (predictability), and identification-based with each level of trust building to the next higher level. The highest level of trust, identification-based, exists because of a mutual understanding of needs and expectation

of need fulfillment. While no empirical studies related to safety research using this taxonomy were identified, it appears a logically appealing leap to posit the applicability of this approach. For example, unless a manager or supervisor provided consistent messages and rewarded safety, the first level of employee trust might not develop and since the levels involved a stepwise progression, the highest level of trust, which would suggest an increased willingness of employees to participate in voluntary activities in response to mutual desires, would not likely develop. Further study in this area would be valuable.

The trust literature also identified leaders building trust in their followers through two independent processes, namely relationship-based and the character-based. Lewicki and Bunker's (as cited by Clark & Payne, 2006) levels of trust building is an example of the relationship-based perspective, as are the various studies of leader-member exchange relationships. Character-based traits also appeared regularly in the trust literature as important antecedents (e.g., Colquitt, Scott, LePine, 2007; Dirks & Ferrin, 2002; Jeffcott, Pidgeon, Weyman, & Walls, 2006; Schoorman et al., 2007). Clark and Payne investigated character-based determinants of trust in leaders within high reliability organizations (HRO). Their sample population included bank employees (financial risk) and hospital employees (safety risk), and they found that perceptions of ability, integrity, fairness, and openness were key attitudinal determinants of trust. Flin and Burns (2004) found similar results in the aviation industry where transformational leaders generated trust through their concern for others and perceived ability and integrity.

Competence levels may play a role in the elevated injury rates in the U.S. land-based operations if the supervisors are not comfortable with their own knowledge about safety. A lack of perceived competence may lead them to avoid discussions of safety precluding important sensegiving messages to employees. In a recent expansion of the direction of trust investigations, Brower, Lester, Korsgaard, and Dineen (2009) studied the influence of mutual trust between supervisor and subordinate in influencing the subordinate's performance (OCB, similar to safety performance). They found that when mutual trust was high, employee performance was higher than when either manager or employee had high trust. Even though trust had previously been found to be positively related to OCB when trust was measured solely from the leaders perspective (Colquitt et al., 2007; Dirks & Ferrin, 2002), the Brower et al. study was the first to investigate the effects of mutual trust. Interestingly, Brower et al. found only limited instances of mutual trust and expanding the study to other populations would add important knowledge in this area.

In a related study of reciprocal and developing trust in teams, Serva, Fuller, and Mayer (2005) found that trust developed and evolved based upon risk-taking actions of one team and the interpretation of these actions by the reciprocal team. Both these studies have potential application to the current study as interventions if trust emerges as a factor directing safety outcomes. Development of trust between employees may be an issue for the land-based operations, as the crews do not spend much time working with the same people. Consequently, the safety culture and trust levels may be prohibited from developing unless very significant actions are taken.

Safety Specific Trust and Safety Performance

Safety-specific trust is emerging as an important variable in safety research (Flin & Burns, 2004) as it impacts various aspects of the safety model, such as safety participation, communication and reporting incidents and hazards, all of which are necessary to minimize risk (Conchie & Donald, 2009). Trust is believed to be critical to developing a strong safety culture (Cox, Jones, & Collinson, 2006; Jeffcott et al., 2006) which is strengthened by safety leadership (Mearns & Flin, 1999) and enables improved performance (Kath et al., 2010). Further, trust between peers enables employee voice and safety participation (Flin & Burns, 2004). Extending research in this realm is important because similar to concerns with non safety-specific transformational leadership, a supervisor or leader can be trustworthy in many aspects of the working relationship, but not in safety related interactions (Kelloway et al., 2006) and this situation could lead to increased injuries.

Current efforts in the safety trust field center on open communication (Conchie & Burns, 2008) and safety-specific leadership behaviors in promoting trust (Conchie & Donald, 2009). These researchers found both aspects create trust and enhance employee safety participation. Currall and Epstein (2003) believed that a continuous supply of information and interactions must take place in order to sustain trust. Even with open communications, trust is difficult to establish, but easy to destroy (Conchie & Burns, 2008). Lack of communication may be an issue for the land-based operations due to the work approach suggesting a rig-site intervention of continuous information delivery.

Related to an offshore energy industry study of trust and safety performance, Conchie and Donald (2006) investigated the type and level of trust important in obtaining good safety performance. Trust in management was the strongest predictor of good performance at an industry level, but at a facility level, contractor and co-worker trust were the strongest predictors. Burns, Mearns, and McGeorge (2006) assessed trust in a gas plant using implicit and explicit measures and found that employees had explicit trust for co-workers, supervisors, and senior managers, but only expressed implicit trust for co-workers. Burns et al. employed an innovative test of word association to identify implicit trust versus using survey self-reports for measurement, minimizing a bias towards answering questions in a manner perceived as expected by the study participants. The differential levels of trust reported by Conchie and Donald (2006) may have been the result of participants reporting on explicit versus implicit trust. Additional studies using indirect measures of trust will help clarify the importance of trust in leaders and co-workers in influencing safety outcomes.

Surprisingly, Conchie and Donald (2006) found levels of distrust were better predictors of safety outcomes contrasting the prevailing negative view of distrust in the literature (e.g., Currall & Epstein, 2003). In a succeeding qualitative study, Conchie and Donald (2008) illuminated this finding by identifying functional trust and distrust as the predictors of good safety outcomes. The authors defined safety-specific trust (distrust) "…as a person's willingness to rely on another based on positive (negative) expectations about their safety behavior or intention to act safely" (p. 93). Employees felt responsible for themselves and others and used functional distrust as a double check for safety

realizing mistakes could happen in complicated systems. Burt, Chmiel, and Hayes (2009) studied forestry workers and found similar results related to trust and distrust of peers newly entering the work group where existing members engaged in risk reducing behaviors related to new employees.

McLain and Jarrell (2007) found that trust influenced the dilemma of safety versus production priority and found that employees and managers were able to achieve both goals when trust was high. The authors surveyed individuals in a variety of industries and the results suggested that when employees got the message to work safely and increase productivity, the results were dependent upon whether the employees trusted management's concept that the demands were compatible. Since the priority of production over safety was found to be a contributor to reduced safety climate (e.g., Seo, 2005), further investigations of the mediating role of trust in this interaction would be worthwhile. To this point, trust in safety research has been rarely measured even though it has been shown to have an important role in safety culture (Flin, Mearns, O'Connor, & Bryden, 2000) and future efforts should be directed towards integrating trust into safety climate models as it shows promise as an important aspect.

Influence of Decision Making on Safety Performance

The focus of the preceding sections was generally on the leader's influence in directing employee behaviors. While very important, recognizing that employees play more than a robotic part in the process is necessary. Employees must be actively involved in the sensemaking process to interpret the level of priority placed on safety by the organization. Employees are also able to exert an individual influence on their

behaviors. In a theoretical review, Zohar and Erev (2007) contemplated the observation of employees seemingly disregarding their personal safety, a basic need (Maslow, 1954/1987), to violate safety procedures. They discussed three behavioral biases that led to violations including underweighting the cost of the delayed outcomes against the short term benefits (melioration bias); underweighting low probability outcomes when choosing among alternatives (recency bias); and underweighting social externalities (outcomes affecting others due to choices made by the decision maker). Employees can control their behavior, but supervisors must promote safety to override these biases by modifying the perceived value of safe behavior (Zohar & Erev, 2007). Safety training was an example of an ongoing supervisory influence used to override these behaviors and provide employees necessary knowledge to exhibit safety compliance (Burke et al., 2006; Lu & Yang, 2010). The manifestation of leadership qualities such as care and concern, and focus on safety can move the equation from certain benefits of short cuts (i.e., productivity increases) to certain benefits of acting safely (i.e., praise from supervisor). Exerting this leadership influence may be the difference between good and poor safety choices.

Prospect theory provides another explanation for the incongruence of employees choosing to put themselves at greater risk by acting unsafely. Specifically, individuals overweight outcomes that are certain and underweight outcomes that are only probable (Kahneman & Tversky, 1979). Prospect theory explained results observed by Mearns and Reader (2008) where employees did not follow safety procedures because they could complete the job faster (i.e., employees appeared more productive) with the unsafe

behaviors overweighted for their certainty versus a possibility of injury if procedures were not followed. A positive safety climate counteracted this situation by making the employees more aware of the requirements and their positive benefits (Clark, 2006). Keren, Mills, Freeman, and Shelley (2009) found additional support for the influence of safety climate in counteracting short cut decision-making. They identified good safety climate levels predicted the selection of safer choices using a decision tree of *taking short-cuts* as the basis. The authors also found a strong influence of peer pressure on poor decision-making. In a qualitative study, Choudhry and Fang (2008) found peer and work pressures were cited by participants as explanations for poor safety behavior. The peer pressure scenario is relevant to the current study in that often times a supervisor will not be at the worksite and the group may directly influence employees (Lewin, 1947). People want to be part of the group and may make unsafe decisions to belong.

In settings where employees did not believe management was concerned about their safety, a counterculture of safety emerged. Employees made seemingly poor safety choices (not wearing PPE), but were effectively combating what they believed to be much greater risks (Walker, 2010). Walker found that the employees "…fool themselves into having a sense of control and then go forth with their day of danger, constantly measuring a dialectic between fatalism and personal responsibility" (p. 335).

In summary, supervisors and managers have great influence over employees and their focus can improve or worsen safety outcomes. However, personal character traits of employees such as risk taking propensity may be too strong for leaders to overcome and while personality traits were not studied in this effort, I recognized that personality traits

might be a potential contributing factor in the trend observed in U.S. land-based operations. Supervisors, however, can take steps to counteract employee tendencies to underweight uncertain outcomes (i.e., being injured) by increasing the benefits of safe behavior. Moving onward to the key aspects identified in the literature as driving safety outcomes, the remaining sections will focus on culture, climate (and its constituents), elements of the workplace safety model, and examples of organizations that have mastered good safety outcomes.

Safety Culture

Safety culture is defined as the perceptions, beliefs, and attitudes related to the importance of safety and shared by a group of individuals (Cooper, 2000; Guldenmund, 2000). Studies of safety culture increased after it was identified as the root cause of the Chernobyl accident (IAEA as cited by Zohar, 2001). Pidgeon (1997) described good safety culture as senior management commitment to safety; shared care and concern for hazards and their impacts on individuals; realistic and flexible norms and rules about hazards; analysis and feedback systems, and continual reflection of the organizational monitoring practice. Researchers investigated cultural aspects to determine routes to improve safety outcomes, but Zohar (2001) raised a concern claiming researchers often defined climate and culture interchangeably when they were distinct concepts. Safety climate is a measure of employees' perceptions about the status and importance of safety within an organization (e.g., the policies, procedures, and practices), and their attitudes and beliefs related to behaving and acting safely or taking risks (Griffin & Neal, 2000; Mearns & Flin, 1999; Mearns, Whitaker, & Flin, 2001). The degree to which this

perception was shared among employees was identified as the strength of the climate (Neal & Griffin, 2004; Zohar, 2001, 2008; Zohar & Tenne-Gazit, 2008).

Safety culture and climate have been studied and debated for many years with a few authors viewing the terms synonymously (e.g., Hopkins, 2006), but most viewing them as separate (e.g., DeJoy, Schaffer, Wilson, Vandenberg, & Butts, 2004; Fullarton & Stokes, 2007; Mearns & Flin, 1999; Mearns & Yule, 2009). Safety climate and safety culture are both composite measures and the underlying drivers are similar. For example, studies generally identified management commitment and workforce involvement as key characteristics of good safety culture/climate (Mearns & Yule, 2009). An in depth review of this long-standing dialogue is beyond the scope of this work but the influence of key efforts in the field are pertinent to the proposed study because from an accident causation lens, an organization's culture can create blind spots (e.g., accepting malfunctions as normal operations) that may lead to injuries or disaster (Pidgeon, 1997). In this section an effort is made to review studies where the focus was clearly on culture versus climate; but a bright line did not always exist (e.g., Cox, Tomás, Cheyne, & Oliver, 1998).

A number of scholars provided good reviews of the importance of culture affecting safety outcomes. For example, Glendon and Stanton (2000) presented a theoretical review of culture, specifically safety culture as nestled within the realm of organizational culture. They clarified that culture could be viewed through functionalist and interpretive perspectives. In the former view, culture existed to serve as the organization's roadmap to success, and to support management strategies. The latter

view implied the generation of a complex phenomenon that served a sensemaking purpose for the organization's members.

In a recent review of the state of safety culture and climate research, Guldenmund (2007) found that management factors were reported in at least 72% of the studies, safety systems about 67%, risk about 67%, work pressure about 33% and competence and procedures about 33% of the studies (Flin et al., 2000). Fernández-Muñiz, Montes-Peón, and Váquez-Ordás (2007) conducted a survey study investigating the role of safety culture as a means of improving workplace safety in a group of 455 Spanish companies. They found that managers' commitment to developing a safety management system, appropriate policies and procedures, and their positive attitudes and behaviors towards accident prevention positively influenced employees' involvement and participation in safety activities.

O'Toole (2002) found similar results within a concrete producer in the U.S. where management worked to improve the safety culture through leadership training and management accountability (e.g., behavior modeling, positive feedback) and found that occupational injuries decreased over time while employee perceptions of management commitment to safety increased. Naevestad (2010) found that a culture improvement campaign focused at offshore energy industry employees changed the group culture, but interestingly, each group was affected in a different way. For instance, managers realized that they set the tone by the level of resources and work pressure they provided. These studies support campaign interventions (common in the energy industry) as a means of improving overall culture and management awareness.

A shortcoming of some of the research focus was that safety culture studies rarely considered issues of power or conflict and tended to assume consensus throughout the organization (Antonsen, 2009a). An exception was the work of Richter and Koch (2004) investigating the existence of multiple cultures in three Danish manufacturing organizations. They identified three safety cultures: production, welfare, and master existing within the organizations. At the management level, a production culture (production over safety, risks are normal) predominated, but the other cultures were present. Within the safety organization the culture included both welfare (caring and guidance, risks are unacceptable), and master (good skills will keep you safe, risk taking is unacceptable) were observed. The authors hypothesized that these company cultural differences were the reason implementing effective preventive measures was difficult and lent support to the importance of researching culture from varying viewpoints.

Haukelid (2008; 2006a) provided an anthropological and historical review of the evolution of culture in the Norwegian drilling industry. He identified four major stages: *Texas, The Great Change, The Systems,* and *The Cultural Solution*. The drivers to the stages appear especially germane to the potential situation in the U.S. land-based operations. The Texas era, the beginning of the industry in Norway (1966 – 1980) was characterized by a wild, rough, and macho culture; a time when many accidents occurred. Workers referred to each other as *Oil Field Trash* as they were relatively uneducated and worked in a *fast and furious manner*. Those that could not keep up or did not like the conditions were forced out so risk-taking behavior was self selected. In 1980, the Aleksander Kielland rig disaster (123 employees were killed) occurred prompting a

forceful movement away from the Texas era to the next era by government regulators in the Norwegian sector (Haukelid, 2008).

The Great Change (1980 - 1990), the subsequent era, was a time when safety measures, internal controls, and rules and regulations were implemented and rigs advanced technologically (i.e., were automated; Haukelid, 2006a, 2008). At this point, the technological solutions did not result in fewer accidents, just different ones. During this time, the Chernobyl disaster occurred and the cry for improved safety culture began, but was not adopted in this sector (Haukelid, 2006a; 2008a). A second rig (Piper Alpha) disaster in the North Sea ushered in The Systems era (1990 – 2000). Led by U.K. regulators, formal management and risk assessment systems came into vogue. Employees did not embrace the complicated requirements because of the added bureaucracy and the fact that management sent mixed messages about production and safety (Haukelid, 2006a; 2008).

The final era, the Cultural Solution (2000 – present), was led by a number large international energy companies, key academic scholars (e.g., Haukelid, Hudson, Mearns and colleagues), regulators, and industry associations (Haukelid, 2006a; 2008). Industry programs (Safety Forum, Working Together for Safety, Step Change, etc.) were introduced to elevate the culture. Haukelid (2006b) investigated (qualitative study) three offshore oil and gas installations in the Norwegian sector of the North Sea to determine the reasons behind their improved safety outcomes and concluded that the results were due to a continuous commitment and a holistic approach to safety culture. Specific attributes identified by Haukelid (2006b) included systematic work processes, addressing

reasonable HS&E requests were addressed (safety a priority), good relationships and trust between employees and supervisors, cooperation, risk areas prioritized and addressed, stable work crews, safety concerns by leaders, and a reasonable work pace.

This historical review by Haukelid, while interesting in its own right, does potentially shed light on the U.S. land-based situation. There have not been any serious, large-scale fatality disasters on the magnitude of those in the North Sea and up until recently (e.g., Gulf of Mexico, Macondo oil spill) no climatic episode mustered the regulatory forces to greater levels of scrutiny in the U.S. The recent drilling disaster has created much activity and will likely result in future changes, but given that a culture is so deeply rooted in a country or industry that blind spots develop, it is perhaps not surprising that the U.S. land-based operations are struggling and not fully at the cultural era. These points are supported by positions taken by Hopkins (2006) who claimed external forces such as societal pressures, and regulatory requirements and other pressures shaped an organization's culture.

External pressures such as national cultures have been studies by a few researchers in the energy industry. Mearns et al. (2004) investigated differences in safety outcomes between Norwegian and British oil and gas offshore installations and found that the specific installation (e.g., leader) was more important than national culture in predicting safety outcomes. Høivik, Tharaldsen, Baste, and Moen (2009) found supporting results related to company versus installation influence. In a survey study conducted at offshore oil and gas installations in the North Sea, the specific installation versus the company managing the installation had a greater affect on safety outcomes

than national culture. Cox and Cheyne (2000) found a similar relationship in another study conducted in the offshore environment where individual and job attitudes, management commitment, and the perception of priority on safety explained differences between installations.

Mearns and Yule (2009) reviewed research related to national cultures and differences in attitudes, perceptions and beliefs regarding safety by measuring risk taking and safety behaviors instead of injury rates to minimize reporting bias. They found that management commitment and the effectiveness of safety measures had a greater influence than national culture. Similarly, Burke et al. (2008) found a positive safety climate, influenced by management commitment overrode the national cultural influence of uncertainly avoidance on the effectiveness of safety training.

In a reverse view of the national culture phenomena, Spangenberg, et al. (2003) studied employees from similar cultures (Denmark and Sweden), but with different safety outcomes (Danish injury rates four time higher than Swedish rates) during a simultaneous construction project. This injury trend generally held true for the construction industry in Denmark and Sweden (Spangenberg et al., 2003). They found macro (educational, employment, and wage practices), meso (contractor versus full time employees), and micro (training, formal versus on the job, and return to work cultures) level factors explained the trend rather than culture.

In a qualitative study of safety culture conducted in the energy industry, Høivik, Moen, Mearns, and Haukelid (2009) interviewed 31 employees (supervisors, employees and HS&E managers) and found that management was often referenced as key to good

HS&E results, but that each group played a role. In this study, culture was synonymous with attitudes and behaviors; six themes emerged as important conditions: management collaboration, procedures, behavior, physical work conditions, and competence. Of particular note, the participants identified the large and complex set of procedures that they were required to follow believing these prescriptive procedures did not allow for critical thinking and personal responsibility during critical situations (i.e., non-routine).

These participants' comments echo findings in the early Butler and Jones (1979) study conducted on U.S. navy ships where leaders were able to allow experienced employees to develop novel solutions to crises and later return to direct supervision under routine conditions. Antonsen (2009b) provided further support for this view through a mixed methods study of supply boats crews. The participants had great confidence in their skills and ability to deal with risky situations and exhibited strong community fellowship. Practical knowledge was deemed more important than checklists, but this group of employees was identified as taking greater risks.

Edwards and Jabs (2009) investigated the consequences of a currently popular approach to safety and improving safety culture, namely shared governance (also known as team-based safety) via a qualitative study in a high tech industry. The authors found a paradox between the company's legal responsibilities in formally ensuring their employees' safety (i.e., bureaucratic control) and the tenets of employee based governance (allowing employees to run safety programs). Their findings indicated the halfway approach to providing employees a stake in the process alienated employees who believed the compliance aspect discounted their personal expertise. One particularly

telling comment highlighted by the authors included an employee stating that they should be able to decide whether to wear safety glasses because they were willing to take the risk and they are not affecting other employees.

The authors did not specifically comment on this point, but missed an opportunity to highlight that assessing risk is subjective (Antonsen, 2009 b); accepting risk and accepting the consequence (e.g., debilitating eye injury with costly medical bills and potential loss of future income) were not equivalent. This statement also implied a lack of true reflection on the impact of others (e.g., co-workers that may need to take on responsibilities of the injured worker and family suffering consequences of event). The comment serves to illustrate the principles noted by Zohar and Erev (2007) in discounting social externalities and prospect theory (Kahneman & Tversky, 1979) where the employee discounted future consequence for short-term gains (i.e., comfort in not wearing safety glasses). Safety practitioners, like employees, may not recognize this phenomenon (discounting of potential outcomes), which would serve as a good intervention study.

Lastly, on culture, scholars have expressed concerns with the survey method of culture studies (Guldenmund, 2007) and several authors developed innovative approaches to counteract this problem. Hopkins (2006) used ethnographic methods, specifically studying materials created as a result of investigations into major accidents to determine how companies handled negative information, found blame, or learned. This type of approach would work well in the energy industry as incident investigations are quite detailed especially for serious episodes. Regardless of any imperfections, the sum of

these studies indicates leadership and management commitment, safety policies and procedures, physical work situation, and external factors are drivers of culture. As will be seen in the next section, these are similarly identified in climate studies. Further, at least in the energy industry, national culture was not found to be an overriding factor in determining safety outcomes.

Safety Climate

The energy industry has a longstanding desire to improve safety outcomes, investigating and determining factors that influence safety performance is very important. While not many academic efforts have focused on this industry (Høivik, Tharaldsen, Baste, & Moen, 2009), the existing work does serve as a guide to this research effort. In this industry, Flin and Mearns (2002) and Mearns, Whitaker and Flin (2001) identified safety climate as a leading indicator of safety outcomes. For example, perceived management commitment and willingness to self-report accidents were correlated with personal accident involvement and when these aspects are found lacking, an intervention can be targeted. When managers communicated the importance of safety through goals, rewards, policies, and procedures, employees were able to understand priorities (Thompson et al., 1998). Safety climate levels predicted accident reporting in these environments and good management systems and auditing programs predicted lower injury rates. Reporting accidents was critical to reducing them so encouraging reporting and removing disincentives (i.e., fostering employee voice) must be a high priority for organizations (Mearns, Flin, Gordon, & Fleming, 2001; Mearns et al., 2003). When using safety climate as a predictor of system weakness, various interv ntion strategies can

be planned. A review of the aspects of safety climate is instructive for identifying potential weaknesses in U.S. land-based operations.

The concept of climate can be traced to Lewin and his associates in developing motivation theory (Kozlowski & Doherty, 1989). Early theorists (e.g., Blake & Mouton, Lewin, and Likert, all as cited by Kozlowski & Doherty, 1989) believed leaders affected climate perceptions of employees. These early theories prompted lines of research starting with the seminal work by Zohar (1980), investigating safety climate in various industries to identify factors determining employee safety. Zohar's (1980) early findings have been replicated in a variety of industries (Cox et al., 1998; DeJoy et al., 2004; Flin et al., 2000; Griffin & Neal, 2000; Gyekye, 2005; Pousette et al., 2008) and prompted more detailed research into constructs comprising safety climate (see later sections).

Zohar and Luria (2005) and Zohar (2008) enhanced the sophistication of safety climate studies by testing a multilevel model of safety climate covering organizational and group level impacts and considering the interplay between senior manager responsibility for developing goals, policies, practices, and procedures and the implementation of these items by middle and lower levels of management. They found both levels aligned, but variations in safety performance were attributed to supervisor discretion in procedural implementation. Supervisors were able to provide feedback on safety behaviors more frequently and thus have greater influence on the local climate. Actual supervisor practices informed employees of the true priorities of safety (Zohar, 2008); a three-factor model of caring, compliance, and coaching was identified as the key attributes leading to high climate scores (Zohar and Luria, 2005).

In addition to measuring levels of safety climate and identifying aspects important in creating a good climate, many researchers have investigated the link between safety climate and safety outcomes whether directly or indirectly, but with mixed results. Among others, Cooper and Phillips (2004) identified a positive relationship between safety climate and safe behavior. Hofmann and Stetzer (1996), Johnson (2007), Neal and Griffin (2006), Nielsen, Rasmusen, Glasscock, and Spangerberg (2008), Seo (2005), and Zohar (2000) found support for a connection between safety climate and injury rates. However, in a meta-analysis conducted by Clark (2006), safety climate only showed a small positive correlation to accidents. A complicating factor in the review conducted by Clark may have been accident definitions used by different researchers and the timeframe of measuring relatively rare events. Safety outcomes were not always measured similarly across studies ranging from collecting self-reported behavioral intentions to injuries requiring medical treatment. Clark identified a stronger correlation between safety climate and employee participation and to a lesser extent, compliance. Clark believed that effects of safety climate were not consistent across occupational settings.

Christian et al. (2009), in a more recent meta-analysis examining both person and situation based antecedents of safety performance and outcomes, found a significant relationship between safety climate and safety outcomes and shed light on the mixed findings of the previous review. They identified a model pathway leading from behaviors and situations to safety outcomes and found stronger effects for proximal factors than distal factors. Distal factors included situational items such as safety climate (e.g., management commitment and supervisors support, human resource practices, group

process, job risk and work pressure) and leadership and person related factors such as personality characteristics and employee attitudes about the job and safety. Proximal factors included motivation and knowledge. Consequently, the more detailed level of analysis revealed both situational and personal factors important in driving safety outcomes and providing visibility to effective intervention points once gaps were identified.

Studying personality traits as a factor in the trend observed in U.S. land-based operations was beyond the scope of this work and not studied in depth in the safety literature. However, of the Big 5 personality traits (conscientiousness, neuroticism, extraversion, locus of control, and risk taking), only conscientiousness was found to be related to safety motivation and a predictor of job performance (Barrick & Mount, Salgado, and Stewart, all as cited by Wallace & Chen, 2006). The level of this characteristic has not been studied in energy industry employees, but Haukelid (2008) predicted the concentration of risk seeking personalities might cluster in particular industries such as the energy industry leading to riskier decisions and behaviors. Further research in this field would help clarify the role of personality traits on safety outcomes.

Overall, safety climate has been well studied in the safety literature; threads include developing good measures of climate to teasing out the specific roles individual aspects of safety climate play. Understanding the antecedents to good safety climate is important to developing effective intervention strategies (Mearns et al., 2003) and potentially in identifying underlying reasons for the elevated injury trends in U.S. land-

based operations. The remaining aspects of the model proposed by Christian et al. (2009) will be covered in succeeding sections.

Management Commitment/Supervisor-Coworker Support

Management commitment to safety is determined by the priority given to safety, the level of safety communication, and the level of action dealing with safety issues (Burke et al., 2008). Fernández-Muñiz et al. (2007) stated that, "… managers play an essential role in reducing occupational accident rates, since they have a dual influence on employees' attitudes and behaviors" (p. 636). Manager involvement is reflected in informal communications with employees, contributions to safety meetings, and workplace visits to assess conditions. Supervisors that increased safety related interactions were able to influence employee safety behaviors and climate scores, but these supervisors required support from their managers in order to maintain the interactions levels (Cooper & Phillips, 2004; Zohar & Luria, 2003) reflecting the multilevel aspect described by Zohar (2008) and Zohar and Luria (2005).

Yule and Flin (2007) tested the relationship between a manager's commitment and employee risk taking and found that the effect was significant, but could be mediated by the employees' knowledge and training. Cheyne, Tomás, Cox, and Oliver (1999) similarly found that employee perceptions of management actions and safety training were related to their views on the organizations' commitment to safety and the employees' intent to act safely. These findings are in line with the model proposed by Christian et al. (2009) since they identified knowledge as a proximal factor influencing safety performance. Rundmo and Hale (2003) investigated attitudes held by senior

managers towards safety and accident prevention in a Norwegian oil company. The most significant correlations were between management commitment, involvement in safety work, and attitudes towards rule violations. Interestingly, when managers were asked where they should spend their time, on average, they would spend less time on safe work practices, environmental issues, productivity, product quality, job satisfaction, and conflict management and more time on operational issues (Rundmo & Hale, 2003) suggesting that managers were not fully aware of their importance in driving safety outcomes.

Brown, Willis, and Prussia (2000) presented an alternative viewpoint to the commonly held management belief that unsafe acts by employees are the cause for a majority of injury incidents. They found that a combination of social, technical, and personal factors influenced safe behaviors (i.e., safety participation) and that a chain of events including existing hazards, safety culture, and production pressures influenced safety efficacy and cavalier attitudes. Supervisors or managers that allowed hazards in the workplace to accumulate sent a signal to employees that the organization has a low commitment to safety (Osada as cited by Brown et al., 2000). When hazards were unaddressed, employees tended to see the situations as normal and risky behavior as acceptable. Existing hazards not only resulted in accidents directly, they also created an indirect effect by instilling the perception that safety was not a priority. The unattended hazards coupled with positive vocal support for safety created mixed messages at best for employees and at worst when no vocal support was given to safety specifically indicated to employees where their attention should be placed (Brown et al., 2000).

In a recent study providing support for the work of Brown et al. (2000), Alper and Barsk (2009) conducted an evaluation of accident causation focusing on the underlying causes of rule violations. They categorized rule violations into individual characteristics, information/education/training, engineered design to support worker's needs, safety climate, competing goals, and problems with rules. Specifically for safety climate, Alper and Barsk identified management's blind eye to violations, and poor advice to employees encouraging rule violations leading employees to believe management condoned violations. In a slightly different tack, Mearns and Reader (2008) found that safety performance was enhanced when employees perceived organizational support, and concern for well-being by supervisors and co-workers. These perceptions increased safety citizenship behaviors and resulted in improved safety results. Apparently, support, whether for safety directly or well being, implies a concern for individuals that fosters reciprocal safe behaviors from employees (Mearns & Reader, 2008).

Studies reviewed for this section focused on manager and supervisor support and indicated a significant influence on safety behaviors and performance as measured by safety climate levels and outcomes. It is not surprising that management has this influence, but an avenue worth exploring is whether management understand and accepts the responsibility as part of their formal roles.

Work Pressure or Production over Safety

Work pressure or the perception that production must be accomplished as a priority has been investigated in several studies (Brown et al., 2000; Choudhry & Fang, 2008; Seo, 2005) and found to have a negative correlation with safety outcomes. When

production took priority, safety assumed a negative trade-off in terms of limited resources or heavy competition (Antonsen, 2009a). Most studies identified the handling of this tradeoff (i.e., safety or production as a priority) as supporting or deterring safety outcomes, respectively. Mearns, Flin, Gordon, and Fleming (2001) investigated the underlying structure of offshore employees' attitudes to safety and found that unsafe behaviors were driven by a perception of production priority. Further, competing goals or role overload were positively associated with safety violations (Alper & Karsh, 2009).

A few investigators found that production and safety could co-exist if there was trust in management to look out for the employees' well being (McLain & Jarrell, 2007). A good leader-member exchange relationship encouraged concern for employees and a greater emphasis on safety especially when hazard levels were high. When this concern existed, leaders could resist the short term pressures in favor of the long term goals (Hoffmann, Morgeson, & Gerras, 2003; Zohar, 2003). When safety issues were ignored or became contingent upon production pressures, a low safety climate manifested due to employee perceptions of low priority on safety (Zohar, 2003). Wallace and Chen (2006) found the character trait of conscientiousness coupled with regulatory focus influenced productivity and safety outcomes positively. Self-regulation had an intermediary role and conscientiousness was positively associated with both safety and production. In their study, safety climate was positively associated with safety performance, but negatively predicted production.

In a slightly different tack to production priority, Hofmann and Stetzer (1996), in a study of U.S. chemical plants, found individual perception of role overload positively

related to unsafe behaviors. When employees perceived their work could not be completed during normal working hours, they took short cuts in order to complete their work. Mullen (2004) in a qualitative investigation of seven individuals (four males) in a variety of high risk occupations (e.g., police officer, diver) found role overload, production priority, self image, socialization influences, and perceived risks influenced the safe or unsafe behavior of the individuals. Individuals felt production pressure from supervisors and peers and both groups influenced work processes (safe or not).

Turner, Chmiel, and Walls (2005) investigated the role of job demands and control in predicting safety citizenship behaviors in railway workers. They found high job demands negatively related to safety citizenship, but job control was positively related. Employees with high job demands were less likely to consider safety as part of their role supporting findings from Hofmann and Stetzer (1996). Employees with high job control were more likely to view safety as part of their role; consequently, in situations where role overload cannot be avoided employees should have a strong voice in their responsibilities. The interaction of the two constructs, for example high strain jobs (i.e., high demand, low control) resulted in lower safety citizenship behavior than low strain (low demand, high control), passive (low, low), or active (high, high) jobs. Job control allowed workers to manage stresses and demands since there was active learning and motivation (Turner et al., 2005).

These studies illustrated how work pressure and role overload fed the cycle of discounting long-term consequences over short-term gains (Zohar & Erev, 2007) and the role that personality characteristics play in the behaviors employees find acceptable. If

managers are not compensating for the short-term gains of risky behaviors or allowing job control, and peers are not providing their support, the employee's remaining defense may be that of a conscientious versus risk taking character.

Job/Safety Attitudes (Risk Perceptions)

Risk and safety are socially constructed, clear at either end, but in the middle, conceptions of safe or dangerous and associated appropriate behaviors are grey (Antonsen, 2009b). Illustrations of the variability in societal acceptance of safe or risky situations can be seen over time (e.g., evolution of smoking mores in the U.S.) or via different national cultures (e.g., bamboo scaffolds and little employee protective equipment in Far East countries) and can be construed within or outside of the organizational life (Richter & Koch, 2004). Acceptable current practices may be unacceptable in the future and the culture of an organization plays a large role in drawing this line of acceptability (Pidgeon, 1991, 1997).

Antonsen (2009a; 2009b) characterized organizational life through conflicts over scarce resources and appropriate safety efforts subjected to debate and disagreement. Further, Antonsen (2009a; 2009b) stated "…managers' view on safety is a view from the top. This is not the only view, and not always the correct view on safety related problems" (p. 190). Asymmetrical power relationships influenced decision making in determining when the situation was safe; for example, a manager may override an employee's concerns about a hazard and force an unsafe action. In the energy industry, specifically in land-based operations, the *company man* (i.e., local representative of the operating company) can play this role and intimidate employees into working in

hazardous conditions. Employees may find themselves in situations they know are unsafe, but feel forced to make difficult decisions. Supporting these findings are results from a study by Emberland and Rundmo (2010) where job insecurity was related to increased risky behavior.

Flin, Mearns, Gordon, & Fleming (1996) investigated risk perception by employees on platforms specifically after the Piper Alpha accident in the North Sea. They interviewed contractor and full-time employees and found a difference in the perception of risk amongst groups, but generally, employees were aware of the most likely causes of injury. Cree and Kelloway (1997) created a model depicting the linkage between subjective risk perception, the willingness to participate in safety, and employee turnover-intentions (negative outcome). Their results indicated risk perception was based on accident history and an individual's perceptions of co-worker willingness to participate in safety. Consequently, co-worker behaviors and subjective decisions, by either the employee or supervisor, may be creating dangerous situations where employees become less willing to exhibit safe behaviors.

Arezes and Miguel (2008) studied the correlation between risk perception and the use of protective equipment such as hearing protection. Employees tended to use subjective risk assessments to identify potential risks and adjust behavior (Arezes & Miguel, 2008). The level of PPE use was highest when employees perceived the risk accurately, but often they did not fully perceive the risk associated with the hazard. Conversely, Mullen (2004) found that even when individuals acknowledged the risks of their occupations, most did not use this factor as a mediator for safe behavior because the

positives of a good job outweighed the negative consequences of the risk. These divergent results may be associated with the ability of the employee to predict risk accurately and not overweight the short-term benefits of risk taking. The aspect of risk perception and its influence on safety outcomes deserves further study to identify important drivers and meaningful interventions.

Safety Motivation and Knowledge

Several researchers identified safety motivation and knowledge as proximal factors in the model of safe workplaces (Christian et al., 2009; Neal & Griffin, 2006); influencing employee safety motivation over time has been shown to result in improved safety outcomes (Neal & Griffin, 2006). Motivation and knowledge are in turn influenced by various factors such as safety climate (Neal & Griffin, 2006), leadership (Bono & Judge, 2003; Ford & Tetrick, 2008; Lu & Yang, 2010), personality characteristics, and attitudes (Christian et al., 2009). The fields of motivation research and learning are broad, but the present review will focus on their effects in influencing appropriate safety behavior.

Researchers identified supervisors and organizational situations (i.e., safety climate) as key to creating the conditions for positive and negative influences of motivation to safety outcomes (Christian et al., 2009). Mearns and Reader (2008), in their study of 18 offshore installations in the North Sea (U.K. sector), put forth the position that safety (outcomes) was not motivating; when performance was good nothing happened (i.e., no incidents occurred) and in the absence of any feedback, it was difficult to keep employees motivated to engage in safe behaviors. Consequently, the aim of

leader driven motivation was not simply emphasizing the goal of safety outcomes, but the continued positive feedback in order to motivate employees to continue safe behaviors when performance was good (Mearns & Reader, 2008).

In addition to proper motivation, employees must have a base set of knowledge to understand and react to hazards in their work environment and exhibit appropriate safe behaviors. Motivation without knowledge did not result in better performance, but as employee knowledge increased, rule violations or unsafe behaviors decreased (Alper & Karsh, 2009). Training did have a strong correlation with appropriate risk perception (Arezes & Miguel, 2008) feeding into a better assessment of risk and protective measures ultimately leading to reduced injuries.

Safety training was found to be the key aspect in promoting safe behaviors and their commitment to safety (i.e., motivation) was related to the quality of the training (Arboleda, Morrow, Crum, & Shelley, 2003; Burke et al., 2006; Cheyne et al., 1999). Larsson, Pousette, and Törner (2008) found that employee knowledge and motivation mediated the relationship between psychological climate and safety behavior. Larsson et al. identified a favorable climate as one where individuals understood their jobs and roles, got clear feedback on their performance, and participated in work direction decisions (i.e., job control). As supervisors and other leaders are responsible for creating this type of psychological climate either through appropriate leadership styles (e.g., participative) or through good leader-member exchange relationships, the authors suggested that improving safety behavior of employees could be accomplished by providing appropriate training to the supervisors and managers.

Similarly, Colligan and Cohen (2004) found that education was an important aspect of behavioral change, but it was not enough to create lasting changes if employees perceived the burden of creating safer work place was placed solely upon them. Leader-based training programs were effective (i.e., interaction between leaders and employees) and economical since fewer managers versus all employees required training (Zohar, 2002b). Further, employees interpreted (sensemaking) receiving training as a measure of safety importance indicated by the company (Lauver & Lester, 2007).

Burke, Sarpy, Tesluk, and Smith-Crowe (2002) developed a model predicting safety performance factors (generally the compliance and commitment aspects described by other authors), which included using PPE, engaging in work practices to reduce risk, communicating safety information, and exercising employee rights and responsibilities related to training levels. They tested this model with employees in the U.S. hazardous waste industry and found that depth of knowledge was a better predictor of routine safety tasks; they posited that breadth of knowledge would be more important in non-routine circumstances. The results of this study indicated training to have several important dimensions (i.e., depth and breadth) that required consciously developing approaches for a range of situations employees would face.

Employee safety training appears to be linked with safety outcomes; however, Bell and Grushecky (2006) identified an important caveat to the benefits of training; specifically, training did not improve safety outcomes if the risks of hazards were not mitigated through engineering controls first. Nonetheless, from the leader viewpoint, various authors found safety specific transformational leadership training successful in

influencing managers' styles and leading to significant positive effects on safety outcomes (Barling, Weber, & Kelloway, 1996; Colligan & Cohen; 2004; Mullen & Kelloway, 2009; Zohar, 2002b). Based on results from safety training studies, both employees and supervisors benefit from high quality training and the results have been observed as improved safety.

Safety Performance (Compliance and Participation)

Christian et al. (2009) identified safety performance as a proximal and direct antecedent to safety outcome; safety performance was composed of safety compliance (required activities) and safety participation (Ford & Tetrick, 2008; Griffin & Neal, 2000; Neal & Griffin, 2006). Barling and Hutchinson (2000) investigated the extent to which commitment vs. control-based safety practices influenced safety climate in an experimental 2 x 2 design that used a vignette approach. A compliance-based approach relied upon reward and punishment schemes and a commitment-based approach relied upon increased trust and commitment to the organization. The researchers found commitment based practices (transformational leadership aspects) to be a stronger influence on safety climate than control-based practices (transactional leadership based aspects) and proposed that commitment based interventions would maximize safety outcomes. However, their experimental design did not allow correlation to outcome results such as reduced injuries and their study pointed to the complexity of behaviors and attitudes intermingling in relationships to provide a desired result – uninjured employees.

Nonetheless, the important point from Barling and Hutchinson's (2000) research was that if employees believed practices resulted from a genuine concern and respect for them, and there was trust between employees and management, then their commitment was stronger. This finding makes the observations of how management typically responds to increasing occupational injuries by emphasizing management control and employee compliance seem counterintuitive. The typical approach emphasizes rule enforcement, punishment and reward, and a command and control approach instead of actions that would increase employee commitment (Barling, Kelloway, & Iverson, 2003). Clearly, if employees are valuable resources as many companies state in vision and policy statements, where they invest in skill development and Human Resource systems are created to reinforce this model, than command and control should be counterproductive (Barling et al., 2003).

Another angle that researchers have taken in studying employee safety participation is directly through the leadership perspective. For example, transformational leaders were predicted to have a positive influence on safety results because of their focus on influencing employees. Kipnis et al. (as cited by Clarke & Ward, 2006) defined influence tactics as the means by which managers obtained desired safety participation. Influence tactics were divided into three categories: soft, rational, and hard (Kipnis & Schmidt, and Yukl & Falbe, both as cited by Clarke & Ward, 2006). Soft tactics included consultation, inspiration, friendliness, and alignment to organizational goals; rational tactics included persuasive communication and exchange; and hard or forcing tactics including threats and pressure (generally aligned with an

autocratic style). Clark and Ward found soft and rational tactics to have a positive association with safety participation, but unexpectedly, hard tactics did not exhibit a negative association in the U.K. glassware manufacturing operation under study. Consequently, both transactional and transformational leadership styles were effective in increasing participation (Clarke & Ward, 2006) as noted in previous sections.

In highlighting the importance of safety participation over compliance, Zohar (2008) observed that companies often attempted procedural controls to eliminate potential risks before structural (i.e., design) controls because they were less costly, more immediate, and adaptable even though less effective. Procedural controls were only effective in the most routine situations, if conflicting priorities incented employees to take shortcuts (i.e., go around the procedural protections) they failed. Hence work ownership (or citizenship) where employees took on extra role behaviors contributing to their and the organization's well-being (LePine et al. as cited by Zohar, 2008) would be necessary. Could this lack of citizenship behaviors be an answer to the U.S. land-based situation? Is there an abundance of novel situations in the oil field and a dearth of citizenship behavior? If true, managers need to be able to allow work issues to become ownership issues and recognize and reward these when they occur.

Lastly, open communication coupled with trust also improved employee safety participation by enhancing or enabling a reporting culture necessary for learning from previous errors (Reason, 1997). Liu et al. (2010) determined that employee communication or voice is target sensitive and is focused at leaders (speaking up) or peers (speaking out) depending upon the strength of the social exchange relationship, for

example, restricted (between employee and supervisors) or generalized (between peers). Tucker, Chmiel, Turner, Hershcovis, and Stride (2008) found that organizational and coworker support for safety voice in U.K. bus drivers improved employee participation. When safety related exchanges did not exist or were mixed, employees were less likely to share their proactive ideas about safety, a situation that could exist under laissez-faire or even transformational leadership where the safety component is nonexistent. Management influenced this aspect of employee voice by encouraging the appropriate group interactions (Zohar, 2002b). This effect was found to be especially important when the employees were remote from the supervisors on a daily basis (Tucker et al., 2008).

Good Safety Outcomes in Practice: High Reliability Organizations (HRO)

The preceding review of various antecedents affecting safety outcomes provided insight to factors that might be influencing the elevated injury trend in U.S. land-based operations. Equally instructive is a view of organizations that have achieved good safety outcomes such as HROs. HRO theory describes high-risk organizations that have very low injury, accident, and error occurrences, with active control of risks, and reduced technical operational errors (Cox et al., 2006; Pidgeon, 1997; Ruchlin, Hirsch, Dubbs, & Callahan, 2004). Generally, the aviation, biotechnology, chemical, nuclear, offshore oil and gas (but not onshore), and rail industries are cited as HRO organizations. These organizations are preoccupied with potential failures, continual learning, and situational awareness and characterized by employees that are helpful, trusting, friendly, credible, resilient, and have a focus on goal achievement (Pettersen & Aase, 2008; Sneddon et al.,

2006). These elements are easily seen as encompassing safety compliance and especially safety participation.

Three managerial processes supporting good safety culture in HROs are distributed decision-making authority, management by exception, and fostering a sense of the big picture throughout the organization (Ruchlin et al., 2004). The particular combination of distributed authority and vision sharing, the ability to operate in both a centralized and decentralized manner (Hopkins, 2006) may explain the contrast between the findings in the HRO literature and the negative results of management by exception identified by Howell and Hall-Merenda (1999).

Zacharatos, Barling, and Iverson (2005) investigated the role of high-performance work systems related to occupational safety and found a positive relationship. They found that trust in management and good safety climate mediated this relationship arguing that high-performance practices would be related to increased safety performance. Ten important practices were identified and included employment security, selective hiring, extensive training, teams and decentralized decision making, reduced status distinctions, information sharing, contingent compensation, transformational leadership, high quality work, and measurement of management practices (Pfeffer as cited by Zacharatos et al., 2005). Similarly, in a qualitative study of aviation line maintenance activities Pettersen and Aase (2008) found that good safety outcomes required slack time (opposite of role overload), practical knowledge, competence, and appropriate resources in order to accomplish safe work practices. Any of these identified

aspects might be lacking in U.S. land-based operations leading to depressed safety outcomes.

From an opposite perspective, Leveson, Dulac, Marals, and Caroll (2009) and Goh, Brown, and Spickett (2010) reviewed the current state of accident causation models through the lens of normal accident theory (NAT) and HRO theory and found both to be lacking in addressing the underpinnings of accidents. Instead, the authors posited that a systems approach to safety provided a more robust understanding of the causes of accidents and consequently, mechanisms to prevent them. Their systems approach viewed the workplace in typical system theory taxonomy, hierarchical organizational levels with each higher level increasing in complexity and creating the boundaries for the lower level through their emergent properties. Safety was an emergent property of a complex system best used to create the boundaries of safe operation at each level by identifying the design or process with the fewest tradeoffs between safety and other system goals (i.e., production). In the approach advocated by Leveson et al., communication or the flow of information was an important energy source for the system and downward communication was a means of imparting the constraints (e.g., safety policy) while the upward flow informed leaders on how well the constraints were working. This newly emerging line of research appears to hold promise for designing practical organizational structures and interventions. It may be describing a way forward in the U.S. land-based energy industry.

Firm Performance or Why Safety Pays

The search for relationships and drivers for good safety outcomes is influenced by the desire to reduce the number of occupational injuries and employee suffering. However, this focus need not be exclusive as many companies are discovering – good safety also pays. Good safety management was found by Fernández-Muñiz, Montes-Peón, and Váquez-Ordás (2009) to positively influence various aspects of firm performance specifically competitiveness and financial success in the variety of Spanish firms. While the Fernández-Muñiz et al. and other studies identified investment in safety as an important requirement for preventing employee injuries, management was found to lag in their support.

Michael, Evans, Jansen, and Haigth (2005) explored the non-safety related outcomes of good safety climate and found that employees' positive perceptions of manager's commitment to safety not only improved safety performance, but also improved job satisfaction, absenteeism, and organizational commitment. Reduced absenteeism and increased job satisfaction were important to safety as turnover and job focus has been shown to reduce injury rates. They concluded that management concern for employee well being reaped more than safety benefits; it translated to improved financial results. Consequently, the search for mechanisms preventing or enhancing safety in U.S. land-based operations not only serves employees in reduced injuries, it can also provide improved financial performance.

Grounded Theory Methodology

This investigation was conducted using grounded theory method, a qualitative approach appropriate for exploratory studies where knowledge is generated inductively from data provided by study participants (Creswell, 2007, 2009; Leedy & Ormrod, 2009). The term grounded implies that the developed theory or framework is based or grounded in the data collected from the participants (Glaser & Strauss, 1967). In brief, grounded theory methodology consists several steps including identifying a problem of interest where previous specific knowledge does not exist, designing interview questions to investigate the problem, identifying a relevant study population, spending time in the field with the participants collecting data, analyzing data, collecting additional data as dictated by the ongoing analysis, and abstracting themes from the developed categories until the best fit of the collected data develops into the theoretical framework or substantive theory (Corbin & Strauss, 2008; Creswell, 2007, 2009). Similar to quantitative research, this method requires a rigorous approach to each of the identified steps to produce a scholarly effort. Each step is briefly discussed below.

Once a research problem is selected, the questions developed to investigate it should be flexible enough to allow a researcher to travel down paths blazed by study participants, but structured enough to allow the focus of the study to remain in sight (Charmaz, 2006; Corbin & Strauss, 2008). In this method, the researcher decides upon the relevant study population and solicits potential volunteers meeting the criteria of the investigation (Corbin and Strauss, 2008; Creswell, 2007, 2009). The researcher has the responsibility of protecting the confidentiality of the participants and the steps taken to

protect the participants in the current study are described in the next chapter. Further, making transparent the potential bias a researcher brings to the study is an important exercise (Corbin & Strauss, 2008). No researcher should override the participants' views and hence must capture them adequately (Corbin & Strauss, 2008). Common techniques to minimize the potential for bias include writing reflective memos, integration of the data collection and analysis processes, and being sensitive to the participants' voice (Glaser & Strauss, 1967).

Study participants provide the raw data with their responses to the interview questions. During analysis of the data, a series of categories emerge; codes, the descriptors given to concepts in the data and are combined into categories (Glaser & Strauss, 1967). Researchers generate categories through a constant comparison of the codes from and between individual responses and categories are connected around core themes emerging from the analysis. Throughout the process, the researcher writes memos to documents ideas, thoughts, and to organize the emerging themes (Corbin & Strauss, 2008; and Glaser & Strauss). Memos are the venue for the interaction a researcher has with the data in the analysis stage, an opportunity to explore. The researcher may use analytic tools, such as asking questions of the data and probing for higher-level themes in order to identify and connect patterns (Corbin & Strauss, 2008). As the categories continue to emerge and the study is organized through the memoing process, a researcher may find that certain emerging categories require additional details to fully describe the theme. In this case, theoretical, or purposeful sampling of the population or of the collected data fills-in the categories (Corbin & Strauss, 2008). The

researcher stops collecting and analyzing data when theoretical saturation occurs, when no additional new data emerge (Corbin & Strauss, 2008; and Glaser & Strauss, 1967).

The aim of grounded theory is to reveal substantive or formal theory from the data. A unifying explanation of the categories or integration is necessary to build the theory (Corbin & Strauss, 2008; Glaser & Strauss, 1967). A central category may be selected by identifying the common category to which other categories can be linked (Corbin & Strauss, 2008; Glaser and Strauss, 1967). Three techniques are useful in identifying the core category: writing the story line, using diagrams, and reviewing and sorting memos (Corbin & Strauss, 2008). Each of these techniques was used in the current study.

Finally, as with any scholarly study, the effort must be rigorous and valid. Grounded theory studies should be credible, transferable, dependable, and confirmable (Creswell, 2007, 2009). Creswell (2007, 2009) provided guidance for achieving this rigor which included spending extended time in the field with the participants, capitalizing on trusting relationships, checking interpretations with the participants, and conducting purposeful and theoretical sampling while ensuring the confidentiality of the participants. As a final measure, Creswell (2007, 2009) recommended providing negative case information to allow alternative explanations and theoretical frameworks to be reviewed by other scholars.

In summary, grounded theory is a rigorous qualitative method appropriate for generating knowledge inductively. Various theorists (e.g., Glaser, Strauss, Corbin, Creswell, and Charmaz) have developed detailed explanations of the process allowing

new researchers to enter the field. Grounded theory was used for this study because no existing hypotheses addressed the problem of elevated injury rates in U.S. land operations in the oil and gas industry and various scholars (Antonsen, 2009a, 2009b; Guldenmund, 2007; Zohar, 2001) have called for more qualitative studies in investigating the role of leadership influencing safety performance.

Conclusions

The role of this chapter was to present and analyze the existing literature related to safety and the drivers of good safety outcomes or reduced employee injuries. Various threads were identified within the field with leadership holding an important role in the complex, interrelated process. The review identified the importance of leadership directly and indirectly influencing employee behaviors resulting in improved safety outcomes. The review also focused on factors related to good leadership and safety outcomes specifically trust between employees and supervisors/managers and decision-making considerations. Using the Christian et al. (2009) model of workplace safety as a framework, the constructs of safety culture, safety climate and the elements composing climate were reviewed. Proximal factors such as safety motivation and safety knowledge were found to hold direct roles in influencing safety performance. The literature was clear that safety performance (i.e., compliance and participation) had the most direct impact on safety outcomes and various scholars studied these constructs in numerous industries.

Also instructive in contemplating potential drivers of safety outcomes in companies that are still working to improve this aspect of their operations, is the view

from companies and industries that have been successful in reducing these events, namely HROs. Importantly, a view in this realm indicated that the aspects identified in the various research efforts included in this literature review were very similar to the aspects in place at the HROs. In a manner, this review of HROs serves as a validation of the efforts in the other industries and as important direction for the current effort. Finally, a brief review of work that investigated a relationship between good safety outcomes and improved firm performance served as a reminder that beyond the socially important goal of reducing employee injuries, improved financial results were also a benefit.

Current efforts indicated that safety specific transformational leadership and safety specific trust were emerging as important drivers of employee behaviors and ultimately safety outcomes. Leaders were able to influence employee behaviors by overcoming the short terms gains of poor behavior through positive reinforcement of good behaviors (e.g., following procedures) and sending clear messages about the priority of safety. A high quality relationship and motivating actions by leaders encouraged employees to go beyond simple rule following to voluntary actions needed to improve safety in the workplace. Overall, the trends related to improving safety outcomes are well described in the literature; however, the number of potential drivers influencing the goal of improved safety outcomes and the complexity of their relationships leaves open the question of why injury rate trends are elevated in U.S. land-based operations.

While a number of studies have been conducted within the energy industry, none have identified or investigated the serious trend of elevated injury rates in U.S. land-

based operations. This grounded theory study shed light on the experiences of employees and supervisors living the situation and risking their lives simply by going to work. The emerging literature trends indentified safety specific leadership and safety specific trust leading to greater levels of employee participative (safety-related) behaviors. Is this type of leadership lacking or is safety specific trust failing to develop as a result of the physical operations in the U.S. land-based operations? Further, are there drivers such as physical distance preventing supervisors and managers from actually engaging in safety specific transformational leadership or from encouraging employee voice? Are production demands outweighing the vocal messages and causing confusion related to the true priorities?

As with any unchartered territory, the questions are numerous and long to be asked of the individuals best placed to answer them. The next chapter presents a discussion of the approach used to conduct this research effort aimed at investigating the potential causes of the elevated injury rates. The specific methods planned in conducting this grounded theory study are described in detail, including the methods for soliciting study participants and analyzing the data leading to the generated theories. The purpose of the next chapter is to describe the research effort in sufficient detail to allow a critical assessment of the work and replication or further study by future researchers.

Chapter 3: Research Method

Introduction

Examining the role of leadership influencing the elevated injury frequency in the U.S. land-based operations of a service company was the purpose of this research effort. The research questions drove the overall design and methodology of the study, and an appropriate approach was selected to enable a successful study. In this chapter, the research design and methodology are described along with the rationale for the selection. A brief review of the methods considered but not selected is presented in addition to the role of the researcher in the data collection process and the researcher's qualities. Next, the research setting and the selection of the study population including means of accessing the participants and ensuring ethical treatment of the study group are described. The final sections of this chapter provide the study design, data collection and analysis strategies, and the verification steps taken to ensure an acceptable study.

Research Paradigms

In order to select a research methodology, a researcher must define the purpose of the project and the desired outcome (Babbie, 2007) with the research question driving the methodology and planning. In identifying a research question, I selected an issue from my professional experience where a solution would aid in solving an important social problem (Corbin & Strauss, 2008), namely, an excess number of employee injuries, in a context where no scholarly research had previously been conducted. While the research question drove the approach, the selection of a methodology is also directed by philosophical worldviews (Creswell, 2007) spanning positivism/postpositivism,

constructivism, advocacy/participatory, and pragmatism (Creswell, 2009). Positivism/Postpositivism is the traditional research context involving quantitative designs to determine knowledge through the testing of theory via data collection (Babbie, 2007). This approach assumes prior theory and prior knowledge of the research topic exists. In the case of the current research project, no prior theory explaining the observed trend existed. The constructivist view typically involves qualitative investigation where researchers seek to understand the world as it exists. In this context, knowledge is subjective and complex, and summarized by Babbie in the following statement, "most of what you and I know is a matter of agreement and belief. The basis of knowledge is agreement" (p. 3).

The advocacy/participatory worldview typically drives research intertwined with a political agenda requiring some policy development or action. This approach usually involves the participants in the interpretation of the results and the recommendations for future action (Creswell, 2007). Researchers with a pragmatic worldview typically use the mixed methods approach of quantitative and qualitative methods with a focus on problems and solutions. Depending upon the specific issue under study, a researcher may use one of these (i.e., quantitative or qualitative) methods as a primary focal point (Creswell, 2007). In the current study effort, I approached the research questions from a constructivist perspective as a result of an aligned personal worldview and from the specific type of research problem.

Beyond the individual worldview of a researcher directing the methodology choice, the problem under study will also point to an appropriate means of investigation.

For example, qualitative studies are more appropriate than quantitative studies when first exploring a phenomenon where explicit theories do not exist, and the research benefits from a natural as opposed to artificial (i.e., lab) setting (Creswell, 2009; Leedy & Ormond, 2009). Further, qualitative studies are important when the voices of the individuals living the experience need to be heard, when in-depth understanding of the issue is necessary, or when the research question cannot be answered with statistical measures (Creswell, 2009). Quantitative studies are appropriate when testing a specific hypothesis or theory implying topics that have a basis of prior knowledge developed (Babbie, 2007).

Regardless of the type of research approach used by scholars, each has four common constraints: scientific, administrative, political, and ethical (Babbie, 2007; Creswell, 2009). In other words, the efforts must be rigorous with the researcher navigating practical (e.g., data collection and analysis) and political decisions (e.g., interpretive approach), and keeping in mind ethical constraints mandating the researcher prevent harm to the voluntary participants. One difference in data collection between quantitative and qualitative approaches is that in qualitative studies, the researcher is the data collection tool while in quantitative studies instruments such as surveys are typically used to collect data (Creswell, 2007, 2009). The data collection process using qualitative methods consists of observations, interviews, document review, and audio-visual material review (Creswell, 2007, 2009). In quantitative studies, the researcher collects data from a random sample of the population while in qualitative studies, the researcher collects data via purposeful sampling where a collection of individuals either sharing an experience

under study or some other characteristic in common are targeted (Babbie, 2007; Creswell, 2007, 2009).

Common approaches to qualitative studies include narrative research, ethnography, case study, phenomenological, and grounded theory (Creswell, 2007, 2009). The narrative approach involves the in-depth study of the lives of individuals (Creswell, 2007, 2009). This type of research method was not considered appropriate for the current study since the research questions involve exploring the underpinnings of a trend and common patterns versus single individual life histories. Phenomenology is the study of human experience investigated through individual stories identifying the phenomenon that is common to the group or lived by a group of individuals and then reducing the identified experience to a universal description (Creswell, 2007, 2009). While the U.S. land-based employees are part of a common trend, there was no information to suggest they experience a common phenomenon and this approach was not selected to investigate the research questions. Ethnography involves the study of a cultural group (Creswell, 2007, 2009). This approach was determined to be inappropriate because even though the study was conducted in the United States, no preconditions of collecting data from a specific cultural group exist. Using a case study methodology requires the exploration of a single issue through the in-depth investigation of a bounded system such as a company function (Creswell, 2007, 2009). This approach was considered, but discounted because the results would describe the situation encountered in depth, but not allow expansion to potential causes of the observed trends. Lastly, grounded theory methodology was identified as most appropriate because it allowed me

to develop theory related to the observed trend that was grounded in the data obtained from individuals experiencing the phenomenon (Babbie, 2007; Corbin & Strauss, 2008; Creswell, 2007, 2009).

Research Questions

This grounded theory study was guided and framed by the following research questions:

1. What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?
2. How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

Using the information collected from study participants in this investigation, I developed theories, grounded in the data, exploring the role of leadership in driving the elevated injury trend in U.S. land-based operations in an energy industry service company.

Grounded Theory Approach

The purpose of grounded theory research is to develop a theory or theories that are grounded in the data obtained from individuals living the experience with the researcher developing knowledge inductively (Corbin & Strauss, 2008; Creswell, 2007, 2009; Glaser & Strauss, 1967; Leedy & Ormrod, 2009). The developed theory may help explain the shared experience of the individuals participating in the study and likely lead to further research testing the developed theories. A strength of the grounded theory

approach is the comprehensive nature of the observations obtained as part of the data collection process; this approach is well suited to studying attitudes and behaviors in a natural setting (Babbie, 2007).

Grounded theory is an appropriate method when theory does not exist to explain or predict behavioral patterns (Babbie, 2007; Corbin & Strauss, 2008; Creswell, 2009; Glaser & Strauss, 2007). Since specific theories related to the U.S. land injury trend were not located in the literature, this approach provided the most appropriate avenue for the exploratory study necessary to begin theory development. According to Babbie (2007), in using grounded theory, the researcher

> attempt(s) to make sense out of an ongoing process that cannot be predicted in advance - making initial observations, developing tentative general conclusions that suggest particular types of further observations, making those observations and thereby revising your conclusions, and so forth. In short, the alternation of induction and deduction. (p 286)

Further, according to Corbin and Strauss (2008), qualitative research,

> is not a process that can be rigidly codified. What it requires above all, is an intuitive sense of what is going on in the data; trust in the self and the research process; and the ability to remain creative, flexible, and true to the data all at the same time. (p. 16)

The purpose of this research effort was to explore the role of leadership in relation to the elevated injury trend observed in U.S. energy industry land-based operations. Although a rich literature was identified for safety performance in industry generally, and

in the energy industry in particular, no previous scholarly investigation of this observed trend in the energy industry had been completed. Grounded theory methodology was an appropriate method to investigate the research questions identified earlier in this chapter.

Role of the Researcher

I am currently employed as a practitioner in the health, safety, and environmental (HS&E) field for a U.S. energy industry service company. In this role, I have endeavored to provide direction to company leaders and employees on reducing employee injuries and environmental harm. Through my many years as a practitioner, and along with other practitioners in the field, I have reviewed occupational injury rates and have been perplexed at the differential and elevated rate in the U.S. land-based operations. Many actions and attempts at reducing the rate have been implemented (e.g., behavior based safety, focus on family influences); yet a trend comparable to other regions has not been achieved. Various practitioners have investigated specific incidents and accidents, identified root causes, and endeavored to implement solutions, but through all the efforts, the elevated trend remained. My concern for the continued suffering of injured employees led to the selection of this problem within the industry as the dissertation topic. A scholarly investigation of the situation would shed light on appropriate directions for practitioners to follow to solve this long-standing challenge.

While employed by the U.S. energy service company, I am not directly involved in the U.S. land-based operations, but do have a rapport and trust developed with the leaders of this organization. My extensive efforts in the field and working with employees around the world provided a good basis for understanding the situation from

the employee's perspective. The literature review developed for this research effort provided a long list of potential variables potentially at play in this geographic region and having this broad knowledge helped ensure I remained objective through the data collection process. Through my experience as a practitioner in the field, I have a deep understanding of the importance of data driving action and this experience aided in controlling preconceived ideas related to the causes of the elevated trend.

I was responsible for all aspects of the study including developing the interview questions, analyzing the data and developing conclusions grounded in the data. Understanding that flexibility in altering the process to allow the participants to drive the direction was critical to the success of the project. The specific questions and design details were altered as appropriate when driven by the collected data. Further, acknowledging the potential for bias and controlling for this possibility was addressed through reflective thinking and memo writing. Finally, the ability to access other practitioners both inside and outside the company to test generated conclusions and theories to ensure objectiveness and soundness of the process added to the capabilities of the researcher.

Researcher Qualities

Leading researchers and practitioners in grounded theory methodology identify several characteristics of good qualitative researchers. Corbin and Strauss (2008) listed characteristics which included empathy, curiosity, creativity, logical thinking, risk taking, pattern recognition, the ability to deal with ambiguity and unexpected problems, and playing a major role as the data collection tool. These qualities allow researchers to see

the perspective of the study participants in answering the research questions and recognize common as well as outlier concepts bringing them together in a way supported by the data, but elevated into conceptual categories (Glaser & Strauss, 1967). Being able to live through the messiness of the process was an important attribute for conducting this study. In this case, the Walden University Knowledge Area Module process provided the training ground for living with the ambiguity of voluminous material requiring an organizing framework.

Even with high levels of the qualities listed above, every researcher still brings their personal worldview and bias to the investigation. To counteract this ready mindset, I had to be reflexive in order to address my potential influence on the subjects and not override individual opinions or influence comments (Corbin & Strauss, 2008). As a result, qualitative research required a sensitivity that allowed me to put myself in the subject's position to understand their point of view and capture it adequately (Corbin & Strauss, 2008). My background of working with employees and supervisors during incident investigations developed this type of sensitivity. Further, participating as a HS&E auditor within the bounds of professional experience helped develop a good interviewing style.

Research Setting and Participants

Glaser and Strauss (1967) and Corbin and Strauss (2008) identified the criteria for selecting individuals to investigate a research question as those theoretically relevant to the development of emerging categories. Categories are higher-level concepts that compose conceptual elements of theories and a large number of properties are required to

describe categories sufficiently. In targeting the sample population, I expanded the interviews to allow diverse and similar information to be collected and compared as a means of formulating theory (Corbin & Strauss, 2008). In contrast to quantitative studies where study participants must be selected at random to facilitate drawing conclusions based on statistical outcomes (Babbie, 2007), sample selection for qualitative studies should be purposeful (Creswell, 2009). For the current study, simply selecting employees at random could have resulted in a study group that resided outside the area of interest. Instead, specifically selecting U.S. based field employees targeted the group of interest and began the process of identifying appropriate individuals for the study as a starting point to identifying variables associated with the groups.

In the design phase, the final sample size cannot be predicted, but only counted at the end (Glaser & Strauss, 1967). According to Corbin and Strauss (2008),

> concepts that are relevant in data from one participant will almost always be found in data from other participants, though the form they take might be different. And if they are not found in the other data, then the researcher should ask, "Why not?" If at the conclusion of an unstructured interview or observation relevant topics are not covered, the researcher certainly can ask questions about these, especially if he or she feels that the topics are relevant to the study. (p. 48)

I used this guidance to determine the point at which a category was sufficiently developed to stop collecting data. For the current study, a minimum sample size of 10 employees and 10 first-line supervisors (not matched) working in U.S. land-based operations for at least 8 months in the past year was targeted. The actual number of study

participants was 27 (15 employees and 12 supervisors). This number of participants provided sufficient data to describe the emergent categories.

Company records were used to identify approximatley 100 individuals meeting these criteria; invitation letters explaining the purpose of the study and requesting their voluntary participation in the study consisting of a 1 hour interview near their base of operations or by telephone were sent to their homes. My home and personal email addresses were used as the response points to indicate intial interest in the project. I sent a second copy of the orginal letter to any solicited participants that did not respond to the orginal request to obtain additional volunteers. The executive leader for target employee population provided verbal approval and support for the study and formal approval was received from the company (submitted with the Institutional Review Board application). A general communication identifying the study was intended to be provided to managers prior to distributing invitiation letters. The interviews took place in the summer of 2010. I traveled to the participants' locations to conduct the interviews, which occurred at a private location (e.g., office). Interviews also took place via teleconference at a time convenient to the participants. Meeting with participants before and after work hours was also offered as another means of accommodation.

Access to Study Population

In the energy industry in general, and at the target company specifically, incident investigations and conversations regarding safety occur regularly. Most companies in the industry encourage incident reporting including near miss events as a means of learning from actual or potential occurrences. Employees are often included in teams addressing

safety concerns and these discussions are generally positive in nature. The goal of the research, to uncover underlying factors influencing the elevated injury trends in U.S. land-based operations, served the interests of employees and the company. Prior to initiating contact with potential participants or beginning the field portion of the current study, an application was submitted to the Institutional Review Board at Walden University. Once approval was received (approval # 06-09-10-0340739), the selection process was initiated and I contacted the volunteers via telephone to answer questions about the process and schedule convenient times for the interviews.

Ethical Protection of Study Participants

The grounded theory interview process, similar to any process where human participants are included in a study, brought up the requirement for ensuring the protection of the individual in circumstances where information that can negatively affect the person if associated was released. There is a requirement to safeguard the participants from harm and not force individuals to participate, which holds true for all social research (Babbie, 2007; Creswell, 2007, 2009). For this study, consent forms were obtained from each participant prior to beginning interviews and information on the means of safeguarding their identities was provided. The purpose and general design of the study along with the benefits and consequences of participating in the study were explained to the participants before the interview. The benefits of the study included the opportunity to participate in the first scholarly study aimed at identifying the underlying causes of the elevated injury rate in the U.S. land-based operations; the ability to aid

themselves and co-workers in developing insights to reducing injuries, and finally the ability to have their lived experiences heard and represented.

The consequences of participating in the study in general were not expected to be significant, as the participants provided their views on the safety related topics. The planned interview questions did not request sensitive information and employee and supervisor participants were not matched. The interviews were conducted in private and care was taken to maintain confidentiality such that none of the interview comments were attributed to the individual participants. The participants were made aware of their ability to stop participation at any time. I conducted all of the interviews and either transcribed the notes myself or used a third party to transcribe the material (participant identities not included). The raw data files are maintained at my home office ensuring confidentiality. Each interview transcript used a code number in place of the participant's name and a master list of participants, their code numbers, and associated pseudonyms were kept in a separate file at my home office. No other member of the company had access to raw data with employee names identified.

Research Design

This grounded theory study explored the views of employees working in the U.S. land-based operations of an energy industry service company related to drivers of injury rates in this geographic region. The study focused on the role of leadership in influencing this trend and the participant's behaviors and actions; I was open to collecting all information relevant to the issue of safety outcomes, even outside of the focus on leadership. Structured participant interviews were the primary data collection strategy

and the plan for the collecting and analyzing this information is provided in the following sections.

Data Collection Strategies

Grounded theory data collection is purposely systematic and flexible and the researcher must be open to the information provided by the participants (Charmaz, 2006). The goal of data collection is to obtain rich data to understand the social processes at work. According to Charmaz,

> rich data are detailed, focused and full. They reveal participants' views, feelings, intentions, and actions as well as the context and structures of their lives. Obtaining rich data means seeking 'thick' descriptions (Geertz, 1973) such as writing extensive field notes of observations, collecting respondents' written personal accounts, and/or compiling detailed narratives. (p. 14)

I collected data from participants via a structured interview format lasting approximately 1 hour and anticipated interviewing a minimum of 10 employees and 10 first-line supervisors (unmatched), but this figure increased as a result of the number of individuals agreeing to participate. The additional participants' ensured full information was obtained and theoretical saturation was achieved. The interviews were digitally recorded allowing the interviewer to focus on the participant and listen carefully to their information. Precautions were taken (e.g., fresh batteries and a check of the equipment prior to initiating the interviews) to ensure data were captured on the recorder. Field notes were taken at the end of each interview and the recordings were transcribed as soon as practical. Background information, such as the participants' gender, current job, years

at the company, years of experience in the industry, and the level of experience working outside of the U.S. was collected to provide a context for the individual's experiences. This information enabled my recall of the participant if follow-up questions were necessary and allowed verification of the data during the analysis stage.

The interview questions (see Appendix A) cover topics related to the employee's attitudes and behaviors, communication levels and approaches, the participant's views on supervisors/managers' attitudes and behaviors, a focus on leadership approaches and traits, and concluding questions that allowed the participants the opportunity to provide any information they deemed relevant that was not requested. This type of interview process allowed an in-depth exploration of the participants view (Charmaz, 2006) about the role of leadership related to safety outcomes and other important factors influencing these outcomes. Charmaz encouraged choosing questions carefully and asking them slowly to encourage the participant's thoughtful reflection. I reflected upon the outcomes of the early interviews to assess whether any interview questions should be amended, eliminated, or added based upon the direction provided by the participants.

Although I did not anticipate the questions to cause the participants' stress, I was cognizant of the comfort level of the volunteer and the need to ensure no undue harm occurred because of continued questioning. If the study participant did indicate stress or concern, the interview would have been paused to allow the participant to reflect and determine whether to continue the interview.

Designing Questions

In approaching a research design with grounded theory in mind, the investigator has much flexibility in developing questions. Generally, the approach to designing questions included developing a set of topics discussed in depth rather than a set of standardized questions (Corbin & Strauss, 2008). These general topics formed the basis of the interview process. In this study, I relied upon the directions identified by previous researchers in studying safety outcomes or developing models explaining drivers of good safety behavior. Numerous quantitative survey instruments (e.g., Fernández-Muñiz et al., 2007; Mearns et al., 2004; Zohar, 1980) were available in the literature and individual survey questions were reviewed to determine appropriate interview questions to include in the study. A set of questions targeting themes identified in the literature was used as the initial interview guide. This subset was first tested with colleagues to determine appropriateness, flow, and timing. As a result of these initial interviews, minor revisions were made to the questions.

Data Analysis Strategies

In grounded theory method, the researcher codes and analyzes data as soon as practical after collection of the interview information as opposed to at the end of data collection (Charmaz, 2006; Corbin & Strauss, 2008; Glaser & Strauss, 1967). With this approach I looked for patterns in the data, had the flexibility to modify the interview questions and the direction of the study based upon the data obtained from the participants (Corbin & Strauss, 2008). In this study, digitally recorded interviews were conducted and transcribed as soon as possible, but I always prepared field notes of

interview impressions immediately following the end of the interview. The field notes supplemented data obtained directly from the participants and helped interpret the context of the responses.

After the interview data were transcribed, I read the entire transcript to get a sense of the overall content (Corbin & Strauss, 2008), and then conducted a line-by-line coding to define the collected data (Charmaz, 2006). Codes were names given to concepts and in-vivo codes were concepts using the actual words of the participants (Charmaz, 2006; Corbin & Strauss, 2008). The initial or open coding process was the first sort of the data. During this coding process, I attempted to focus on codes that reflected action and strove to remain open to the potential directions indicated by the data (Charmaz, 2006). I did not plan to use a predefined checklist of codes, but had knowledge of key aspects of safety outcomes from the safety literature that served as starting codes.

Analytic tools such as asking questions of the data and making comparisons between codes and the interviews enabled me to probe issues and develop theoretical ideas related to the data (Corbin & Strauss, 2008). A general guide of the types of questions a researcher could ask included sensitizing (e.g., What is going on here?) to help the researcher define the situation; theoretical questions that explored connections; practical questions that provided direction for theoretical sampling and the framework; and guiding questions that directed the interview or observations (Corbin & Strauss, 2006).

Glaser and Strauss (1967) emphasized the use of comparative analysis to generate theoretical ideas by allowing lower level categories to emerge quickly, while identifying

higher-level categories (integration of concepts) later in the analysis. Using the constant comparative method, I compared one incident or concept to the next one within and between interview transcripts (Glaser & Strauss, 1967). Axial coding was used to connect categories that emerged from the data. The aim of this phase was to develop a deeper understanding of the data. In a sense, the data were put back together in a different way to begin to identify the theoretical threads of the lived experiences (Glaser & Strauss, 1967). The analytic strategy of asking questions was used as a means to aid the category combination process.

I used selective coding as the final step of the coding process to integrate the categories around the core category and develop the theoretical framework. Corbin and Strauss (2008) provided several techniques for theoretically integrating the core and related categories including writing the story line, abstracting from the descriptive story, and creating diagrams visually depicting the relationships. I used a narrative approach and created various diagrams to identify relationships to achieve theoretical integration. A computer software package (QSR NVivo 8,) was used to aid in the sorting and analysis of the data.

Memo Writing

Memo writing is a critical aspect of the grounded theory methodology and although the topic is discussed in a separate section, memoing was an integral process throughout the research effort (Corbin & Strauss, 2008). Memos represent the mental dialogue a researcher has with the data and provide an opportunity for brainstorming, ultimately stimulating new ideas and avenues for future directions (Corbin & Strauss,

2008). Memos helped me keep track of thoughts and ideas throughout the study and summary memos synthesized and connected related memos (Corbin & Strauss, 2008). Memos were written throughout the effort, for example, after each interview, during coding sessions, and as a means to assist theoretical integration. The memos were dated and cross-referenced to aid the sorting and review process later in the analysis (Corbin & Strauss, 2008). Schatzman and Strauss (as cited by Corbin & Strauss, 2008) provided a useful organizational scheme of memo types such as *Observational Notes* that describe the actual events, *Theoretical Notes* denoting the researcher's thoughts about those events, and *Methodological Notes* or reminders about some procedural aspect of the study. The researcher prepared versions of these memos (including field notes) as necessary throughout the research effort. Observational and methodological notes were often hand written in the research journal kept throughout the project.

Representation of the Results

An important aspect of the data analysis is the clear and accurate representation of the results of the study. While no preset process is described for qualitative studies (Creswell, 2009), scholars use several common options. These options include providing narrative text to describe the findings. The narrative included direct passages from transcripts to support a point or conclusion. Including in vivo codes provides readers with a flavor for the participants' views and allows a comparison to my conceptualization. Other means of reporting data include visual aids such as diagrams that highlight the relationship of the core category to the other categories or the model developed as a result of the investigation. Graphs and tables may also be used to convey

summary information about the participants or other aspects of the study. For this study, I used a narrative approach to describe the results including summary diagrams of the core categories. In vivo codes were provided to acknowledge the specific data provided by the participants.

Verification

While the approaches may differ, ensuring scientific efforts are rigorous and valid is important for both quantitative and qualitative studies. Many authors (e.g., Charmaz, 2006; Creswell, 2007; Shah & Corley, 2006) identified differences between the two approaches and generally cited the alternatives to verification for qualitative studies presented by Lincoln and Guba (1985). These alternatives include assessing the credibility (i.e., internal validity), transferability (i.e., external validity), dependability (i.e., reliability), and confirmability (i.e., objectivity) of the research effort. Charmaz offered a similar framework for evaluating grounded theory efforts including credibility, originality, resonance, and usefulness. For her, these criteria created a balance between the scientific and creative aspects of the qualitative approach.

Creswell (2007) consolidated a comprehensive list of strategies aligned with the efforts of Lincoln and Guba (1985) and generally in line with the thinking of Charmaz (2006). I used these strategies to facilitate a high quality research effort. Specifically, to ensure credibility, I spent extended time in the field with the participants living the experience under study, capitalizing on trusting relationships, and checking interpretations with the participants. Transcripts were made available to all volunteers to review if requested; interpretations and conceptualization were checked with participants

to ensure their reflections were captured accurately and the theoretical framework rang true. Study interpretations and theoretical conclusions were also checked with practitioners (peer review) both within and outside of my company to assess validity of the findings and to shed different perspectives on the results. In order to aid transferability of the results for future studies, detailed and rich descriptions of the concepts and categories are provided in chapter 4.

Dependability and objectivity of study results were aided by conducting purposeful and theoretical sampling while ensuring the protection of the participants through the confidentiality measures described in this chapter. The upmost care was taken in protecting records, checking for accuracy in data transcription, taking careful notes of processes and design decisions, and creating an audit trail of the efforts (e.g., chronological files of data collection and analysis). Related to ensuring the objectivity of the study, I kept in the forefront the knowledge that biases could invade the study and used reflexive memos to test whether a personal bias was entering the analytic process. Finally, discrepant data or negative case information was described to allow alternative explanations and theoretical frameworks to be reworked until the best fit to the data was obtained.

Summary

Chapter 3 includes the path from research paradigm to study design based around the worldview of the researcher and the specific research problem. The basis for selecting grounded theory versus other qualitative methods was presented and discussed. This section was followed by a description of the role of researcher and the required

qualities. The research setting and participant selection sections provided details on the types of study participants and the steps taken to prevent undue harm to these individuals. Grounded theory design, data collection strategies, and the analytical methods that were employed in this study were described. Finally, the chapter concludes with a discussion of relevant approaches to ensuring a rigorous scientific study by identifying the specific verification techniques that were used. The next chapter provides the results of the study described in this chapter.

Chapter 4: Results

Introduction

The results of the exploratory study investigating the role of leadership on the safety outcomes of a U.S. land-based operation of an energy services company are presented in this chapter. Chapter 4 is organized into several sections describing the process used to gather, document, and interpret the data collected during the field phase of the project. The first section describes the data collection process and details of participant selection and interviewing. The second section describes the methods and steps used to analyze the data, and the third section includes a discussion of the methods used to assess the quality of the data collected and the approaches used to ensure the trustworthiness of the analysis. The next section presents the results of the field research and the findings of the study addressing the research questions posed, namely,

1. What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?
2. How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

The final section provides a summary of the chapter and the relevant findings.

Data Collection Process

A grounded theory approach was used in this study accessing employees and supervisors working for the U.S. land-based operations of an oil field service company as the experts to explore the role of leadership on the elevated incident rates in this region. Study participants provided the data used to answer the research questions and explore aspects of the workplace safety model (Christian et al., 2009) through responses to a guided question interview. I developed the questionnaire based upon themes indentified in the literature and previously found to be relevant to workplace safety. In order to collect the data, a minimum of 10 employees and 10 supervisors having worked for at least 8 months in the U.S. land operations were targeted for participation in the study. The potential participants were selected from a Human Resources (HR) list of U.S. land operations employees. Employees in staff roles and all employees above the first-line supervisor level (based on job titles) were excluded from the selection process. Names from a geographic and product line spread of the organization were selected to invite a broad spectrum of potential participants. I did not personally know any of the participants selected.

The first batch of study invitations was sent to 50 employees and 50 supervisors selected as potential participants. The invitation letter described the general intent of the study and the requirements of a participant (e.g., 60-minute interview). The first round of invitations yielded acceptances from seven supervisor and five employee volunteers. Both positive and negative responses were retained and a second, similar invitation (only letter and response form dates changed) was sent to all of the remaining first batch

candidates that did not submit any response to the initial request. Two additional supervisors and two employees responded to the second request agreeing to participate. One employee responding in this second round had 7 ½ months of service in U.S. land operations; however, I decided to include this employee because she was the only woman to volunteer and a new employee to the industry. Including a female participant from the view of a varied perspective was deemed to outweigh slightly missing the tenure criteria.

Even after the second invitation was sent to the individuals not responding to the initial invitation, the sample size was still below 20, and a second set of 20 supervisors and 50 employees was selected from the HR employee listing. A similar (only letter and response form dates changed) invitation letter was sent to this second group. Three additional supervisors and eight employees responded to this invitation. The last employee volunteer responded to the invitation very late (i.e., once axial coding had begun) but was kept in the pool because I did not want to exclude individuals once they had agreed to participate. This participant's data were coded, but no new initial codes emerged from the process. The total sample size in the study was 27 participants: 12 supervisors and 15 employees.

Prior to sending any invitations, I presented the study overview to the leadership team of the U.S. land organization (i.e., president and vice presidents) to ensure this level of management understood the nature of the study and the purpose of the planned interviews. At the presentation, I proposed to send each of their managers an email describing the intent of the study, informing them of the process of confidential selection and voluntary nature of the study. After a fair amount of discussion with the leadership

team, and in response to their request, I decided not to send this email instead allowing any questions that might come up to be directed to this senior leadership team. The group believed that this would aid in convincing employees of the voluntary and confidential nature of the study. A conversation with one of the senior leaders after all the interviews had been completed revealed that a few managers that had received questions from their employees did in fact call to ask about the study.

Interviews

My purpose in interviewing participants was to obtain a broad and in-depth understanding of their perceptions and experiences related to leadership efforts and injuries in U.S. land operations. A guided question format was used to conduct the interviews and these questions are found in Appendix A. This questionnaire was tested with peer subject matter experts both within the company and with one additional external company expert. This effort revealed that the interviews could be completed within 60 minutes, and the majority of the questions were clear and prompted relevant responses. The testing also resulted in minor wording modifications of some of the questions.

After receiving a positive response to participate from U.S. land employees, each volunteer was contacted by telephone to scheduled interviews at a mutually convenient date and time. Three interviews were conducted in person and 24 by telephone. I had planned to conduct a majority of the interviews in person; however, the geographic distribution of the volunteers (broadly across the U.S.), and the sequentially timed responses to the invitations made in person interviews very difficult. No observable

differences (to the researcher) were noted between the in-person versus telephone interviews. All interviews were conducted in private settings in an office or conference room for the in-person sessions, or from my home or private office on a personal phone. The participants interviewed by phone were either in their work place offices (their choice) or at home during the telephone interviews.

The interviews generally lasted about 60 minutes, although a few were less than 60 minutes, none were longer. Most of the interviews were conducted during business hours; however, one was conducted on a Friday evening and one on a Saturday morning for the convenience of the participants and their work schedules. Each participant completed a consent form prior to the interview and either handed the form to me prior to the in-person interviews, or emailed or faxed back the form prior to the telephone interviews. The interviews began on June 29, 2010 and 26 of the 27 participant interviews were completed by August 30, 2010. The last participant responded late to the invitation and the interview was scheduled for September 29, 2010, interrupted, and concluded on October 4, 2010. A complete list of interview dates and related details is found in Appendix B.

At the start of each interview, I checked to ensure the time was still available to the participant and explained the nature of the study. I also requested permission to record the conversation (included in the consent form, but asked again as a courtesy) and conducted a test of the recording system with the participants prior to beginning each interview. There were no malfunctions of the primary recording system throughout the study. The equipment was a high-quality digital voice recorder (Sony© ICD-PX820) with

the capability to transfer the voice file (Digital Voice Editor Software supplied with the digital recorder) to a computer for later transcription.

During the interviews, the confidential nature of the study was reinforced. The interviews began with some preliminary questions about the participant (see Questions 1-6 in Appendix A) and I generally established a rapport by discussing their current job or answering any questions the participant had about the study; all the participants seemed at ease. During the interview, each participant was reminded that not answering a question or answering with a statement such as "I don't know" was acceptable. I generally followed the interview guideline questions, but was flexible to ask follow-up questions or to skip questions depending upon the responses provided by the participants. The interview questions were generally open-ended and I would ask a probing question such as: (a) "Can you give me an example of the situation?, (b) how will that impact safety?, or (c) can you explain what you mean by that answer?" if the initial response had little detail or was only "*yes* or *no*". While I endeavored not to lead the participants, for a few questions and a few participants, examples of potential answers were provided, as the individual did not understand the question even when rephrased.

At the end of the interview, each participant was asked whether a follow-up telephone call would be acceptable to allow clarification of points. All participants agreed to the potential follow-up contact, but none was required. Two participants contacted me after the interview ended to add information to questions. The final employee participant (E-15) had to end the interview prematurely (3/4 completed) due to a work situation but contacted me later to conclude the interview. The participants were

also informed at the end of the interview that summary material would be sent to them to provide an opportunity to check the validity of my interpretations and conceptualizations. Again, each participant agreed to receive this material, which was sent to all participants, except one who was no longer with the company, on October 11, 2010. Three participants responded to the request for comment and verification and all agreed that the conceptualizations were an accurate reflection of their responses.

Evidence of Quality

The goal for grounded theory studies and all qualitative studies is to produce a scientific effort that is rigorous and valid. Methodology experts identified various approaches in the literature to ensure this rigor, which included spending extended time in the field with participants, capitalizing on trusting relationships, and checking interpretations with the participants (Creswell, 2007). Further, checking theoretical interpretations with subject matter experts provided me an opportunity to assess the validity of the findings through the view of alternative perspectives. Lastly, providing rich descriptions of the categories and concepts, including in vivo codes to support the abstracted categories, and creating a detailed audit trail aids future researchers in assessing the validity of the interpretations and the transferability and replication of the results (Lincoln & Guba, 1985).

I interviewed 27 participants, resulting in approximately 27 hours of recorded data where the intent of the guided questionnaire was to obtain information related to the research questions by approaching the points from a number of directions. For example, participants were asked directly to describe the leadership characteristics that motivated

them to work safety and indirectly by asking what they would like their supervisors to do differently.

I built a rapport with the participants by asking questions about their jobs and tenure at the company; none of the participants seemed concerned about providing information although later interview questions did result in a few participants checking to ensure their supervisor would not learn of their specific responses. Participants were reassured of their confidentiality and the steps taken to protect it were explained carefully. No participants names were stated at any time during the digitally recorded interviews and if the participants identified a location or the name of another employee, the information was either not included in the transcript (researcher's transcripts) or eliminated during the transcript review (third party transcript). None of the participants used their names during the recorded interview. Participants were offered a copy of their transcribed interviews, but none requested a copy. The participants were also provided a summary document of the high level study interpretations and conceptualizations (except for one that had left the company).

Each of the digital interview recordings was transferred to an electronic audio file and transcribed by a third party or by me. The audio file was provided to the third party transcriber on a portable drive and the transcriber returned the drive with the text file upon completion. The printed and electronic files were kept at my home office in a locked file cabinet. Each transcript was reviewed twice to ensure the captured text accurately reflected the recorded material. These quality reviews resulted in a few minor modifications of the text. I used a hard copy of the first transcript for the initial coding

process. Subsequently, electronic transcript files were used to conduct the initial and axial coding in the NVivo 8 software program loaded onto my personal laptop.

I kept a chronological log of the research efforts making note of any process issues or steps in the coding process. A copy of the completed initial coding effort was saved as a specific back-up file in the software to allow recreation of a consolidated or transformed initial code at later stages in the coding process. The back-up version was reviewed once to consider the creation of a specific category. Notes and questions that occurred to me during coding or the transcription effort were captured in a written notebook log for further follow-up or incorporation into a memo.

To aid the review and transferability of the results by future researchers, rich examples of in vivo codes are included in the results section of chapter 4. Codes the that provided contrary or contrasting positions are included to provide an opportunity for differences to be made visible. Details of the research process including selection, interviewing, and analysis are located in Appendix B. Finally, an attempt at data triangulation was made through the matching of interview data with actual injury statistics from the specific locations, but this level of granularity was not available in company records.

Researcher Bias

Researchers bring their worldview and perspectives to qualitative research projects and must address the potential for bias in order to ensure a rigorous study. In the grounded theory approach, Glaser and Strauss (1967) proposed various techniques to mitigate the effects of researcher bias such as the constant comparative method, reflective

memo writing, an integrated approach to collecting and analyzing data, and allowing the data to lead me. In this study, I acknowledged the potential for bias stemming from a history as a HS&E practitioner. Various methods were used to control for the potential bias such as developing and following the structured interview guideline, which while flexible enough to allow me to go down paths identified by the participants, maintained a constant process to follow and return to if necessary. After each interview, field notes of interview impressions were prepared to identify feelings that emerged while listening to the participant answer questions and as a ready place for initial thoughts from the interview.

During the coding process, reflective memo writing was used to examine any positive or negative feelings developing while reviewing the transcripts. Due to extensive experience in the field, I was sensitive to potential nuances and clues provided by the participants. Consequently, as the participants' comments prompted connections in the data, any questions or ideas on future inquiries were kept in a hand written journal always with me during this phase. When a question surfaced, for example, regarding the level of supervisor interaction and the capability of employee hazard recognition, it was noted and addressed it at an appropriate time by recoding the combination of the two responses.

Finally, theoretical interpretations were checked with the participants to ensure that even when their exact words were not used in identifying a core category, the concepts still resonated with them. In this way, the participant's data, and not my bias was at the forefront of the effort.

Data Analysis

Grounded theory methodology is a structured process for collecting and analyzing data that leads to theories emerging from the collected data (Charmaz, 2006; Corbin & Strauss, 2008). The structured process aids in generating the rigor of the study analysis. In this study, methods suggested by Charmaz, and Corbin and Strauss were used to conduct the initial coding. I read the first transcript to gain a sense of the interview details and identified initial codes in the margin of the text during a second read of the transcript. A consolidated a list of codes was obtained from this first transcript and a few potential codes that could be expected in future transcripts were added to the Tree Node option of the NVivo 8 software. I then re-reviewed the first transcript in the NVivo 8 software using the coding function. Any new codes emerging from the electronic transcript analysis were added or clarified and all other transcripts were coded using the software program. If a new code was identified in a subsequent transcript, the previous transcripts were recoded to ensure an appropriate reflection of the data. Appendix C contains a list of the overarching codes developed from the initial coding of the transcripts and Appendix D includes examples of codes taken from the NVivo8 software.

As coding continued, the constant comparison method was used to assess codes within an individual transcript and between transcripts. Categories identified from previously coded transcripts were checked against new categories emerging to determine similarities or differences to either build higher-level categories or subdivide existing categories. Once the initial coding process was completed, I reviewed all the codes enabling the combination like information or elimination of codes that did not develop.

Axial coding was conducted using the Free Node option in NVivo 8 software assessing different combinations of the data and the creation of new categories. Selective coding of particularly relevant categories was conducted to further abstract themes and integrate the framework. Several iterations of diagrams depicting leadership situations were drawn to move this aspect of the analysis forward.

Coding and data analysis were iterative processes and as the analysis progressed, I wrote various types of memos to keep track of ideas and connections, to surface potential biases that might lead me down a narrow path, and as a means of identifying themes emerging from the coding process. Summary memos were used to generate theoretical categories and arrange the codes around the core themes enabling me to answer the research questions. The memo option of the software program allowed me to keep track of categories and integration of themes.

Research Findings

This section contains the findings of the current study presented in a manner intended to address the research questions that guided the effort. The interview transcripts of the 27 study participants were analyzed to develop themes around the role of leadership on the safety performance of the U.S. land operations of an energy service company. These themes are presented through a narrative description and summarized via a model depiction. In vivo codes are interwoven throughout the narrative to support the models, but discrepant cases are presented to acknowledge alternative views.

Of the 27 volunteers that participated in this project, 26 were men and one was a woman. The participants were geographically located in 10 different states where oil and

gas production occurs. In addition, each of the service company product lines was represented by at least one participant. Appendix B provides the specific geographic and product line breakdown. The tenure of the participants ranged from 7 1/2 months for the newest employee to over 30 years for several participants. The majority of participants (18) had more than 10 years of experience in the industry and most participants had been in their current job for less than 5 years, but three participants had been in their roles for more than 10 years. Supervisor participants generally had more than 10 direct reports (10 of 12 supervisor participants) and three of the 10 had more than 20 direct reports. Of the 27 participants, 18 stated that they had never been hurt on the job and the majority of the employees worked in groups of four or less while nine participants worked alone (or in the case of supervisors, their employees worked alone).

Research Question 1

What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?

Collecting data to answer these questions involved interviewing participants using a guided questionnaire. I probed these questions in a variety of ways, including asking direct questions about traits that were deemed motivating to the participant as well as indirectly in probing about aspects of leadership such as participation, communication, responsibility, identifying a vision, and motivating good behavior through positive reinforcement. Through these varied approaches, an idealized view of a leader that

motivates safe behavior and ultimately improved safety outcomes emerged for both the employee and supervisor participants.

Employee participant data revealed an idealized version of a leader as someone that drives safety performance through leading by example, showing care and concern for employees through good relationships and people skills, and promoting safe behavior through celebrating successes. The diagram (Figure 1) depicts the idealized leadership traits expressed by employees to motivate safety behavior.

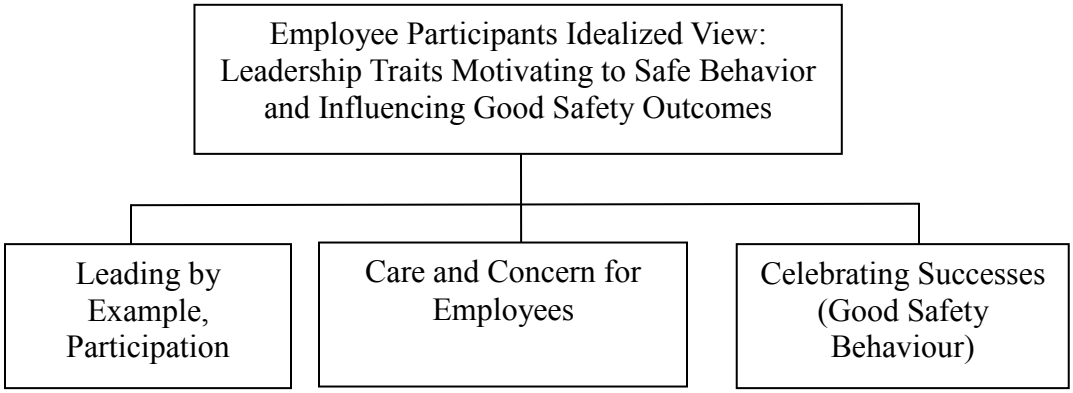

Figure 1. Idealized leadership traits identified by employees as driving good safety behavior and performance.

Leading by example or through a participative approach was the strongest theme to emerge as a leadership trait employee participants identified as motivating to safe behavior. Employee participants wanted to know that the leaders were going to be in the trenches with them to show them the way and make safety a priority or better still, a core value. As described by several participants:

> It is very important for the supervisor to be safety oriented. If that is what they preach, it's safety, and that's eventually all you are going to learn. Granted

> people will go out and work how they want to work, hopefully they will work safely, but if, if that is what you are training on is safety, then that is what you are going to learn, how to work safely. And that is kinda of how it works here, do you have everything you need, is everything going to be okay. They will say be safe, follow the policies. (E-10)
>
> More hands on leadership will go a long way to solving the problem. If people take it seriously and they know that there are repercussions that are going to happen for not doing it safely then the rate will improve. Hands-on leadership, lead by example, and their attitude when they are presenting safety issues. If your first-line leader takes ownership of it, if you put something out or if the president puts something out, and it's coming from him, then out in the field the hands are going to take it a lot more seriously and then if they get an email of safety message from the president. (E-14)

Participants felt that leading by example was a means to building trust with the employees and another way of showing that the supervisor cared about the employees. There were clear positions of leaders showing the way for employees, for being the guiding light when difficult decisions presented themselves.

> I can't stress enough that it goes back to the first-line leaders, and we learn that lesson and situational awareness, we've learned both those lessons and that is the key to safety right there. If your first-line leaders take it seriously then your hands take it seriously. If they don't then people are going to get hurt. (E-14)

One participant was very direct with his comment about the importance of setting the

right example for employees, specifically:

> I believe the more of the example setting I think that is one big thing if you want us to do you do it as well and therefore that makes us more inclined to do it safely too. (E-9)

Many participants were clear about the type of participation they expected from the idealized leader, specifically, being at the worksite to understand the issues faced by the employees. This level of understanding would create an engagement with the employees allowing them an opportunity to be part of the solution. Two participants summed this point up as follows:

> Actually coming out and seeing us and demonstrating a commitment to safety a little more. That might make a difference, actually, because we don't go to the office very much at least those of us that don't live in [named city], I think more of an active role in coming out seeing us and seeing what we are doing and soliciting our opinions about safety issues might lead to a greater amount of awareness. (E-11)

> This influences employees in the wrong direction, especially the young ones. I have 25 years is the army so I am one of the old ones out there. The young MWD [Measurement While Drilling] hands out there the supervisors are the only ones out there that they hear from is their direct supervisor. One of the biggest thing is just because they (rig people) are doing it out there; it's not okay for you to do it. Our supervisors are not aware of the rig situations as much as they could be. A

> lot of things happen out there, but we don't give them a minute by minute report of what happens out there. (E-14)

Many participants agreed with the importance of worksite visits by speaking to situations when incidents occur; specifically, not addressing the cause of the incident well due to a lack of knowledge of the situation. Leadership credibility is lacking when the time spent in the field by leaders is limited or non-existent. Worksite visits accomplished both an example of participation and an opportunity to show concern for the employee's situation especially if the leader explored the working conditions and other concerns voiced by employees during these visits.

> My personal opinion, I feel that the upper echelon look at spreadsheets and they look at numbers they don't go out there and actually go to the field and see what happening and understand what is happening. It is hard for someone that is sitting in an office, someone has an incident in [named state], and no one has ever been to [named state] or been in the field or know what is happening out there. I think that would help out the company. More field involvement. (E-12)
>
> Well there'd be one thing, show up on location, show interested. Get more knowledge about what you do, supervising. (E-7)
>
> I would like to see more people in the field, visiting the rig site when I am working there. (E-10)

These study participant views supported the importance of participation as a leadership trait driving safety. Not a single participant mentioned wanting supervisors in the field less, but there were several participants that did state that their supervisor did visit them

in the field occasionally and several where the supervisor did not ever go to the field.

> I would say a couple times a year. No, it was, oh when was it, it was probably six months ago. (E-6)
>
> No, hardly ever at the rig site. (E-12)

Contrary to the employee statements about the lack of actual worksite visits, supervisor participants discussed their worksite visits as more frequent events, but also in terms of conducting audits, which may not come across in the participative way that employees are envisioning. I did not address this point (i.e., view of audits) with the employee participants since none described a supervisor conducting a safety audit at their work location. Comments from the following supervisors are indicative of the types of efforts a number of supervisor participants described.

> Through our job audit process, which I attempt to do at least ten a year (which I'm very behind this year). I tried to make ten job audits a year and that's on the location so I can observe the entire crew, and get an entire, I guess globalized picture of my operation and see how their actually performing and working together on location. (S-4)
>
> I tried to do 6 audits a year. I used to try and do 12 audits, but I could never reach the goal. Go through all the cables and make sure everything has been pole tested, make sure they have their proper PPE and it's basically a checklist I go through. I have a checklist to use. (S-2)
>
> I do probably 4-5 well site audits, I actually go out to the worksite and we are constantly identifying hazards, being proactive in safety meetings, and telling

> them this is the correct way to do things, we have actually done dry-run rig-ups here at the district. (S-11)

These supervisors described the type of practices that would enable them to provide feedback to employees on appropriate behaviors.

While just getting out to the field locations might appeal to the employees even if some type of audit was occurring there was one supervisor participant that described actions he took that appeared to exemplify the desired idealized state of leading by example. This supervisor relayed the following description:

> Safety meetings, yes, I usually go in the field and do them, and I will do them at the warehouse, but the ones that can't make it into an office meeting, I will try to catch them individually at the location with a safety topic each month and a hands on safety meeting and a little safety meeting. And talk to them about it at the rig site. And I try, usually I average 10-15 hands a month, catching them at the rig. And we have like two days a month safety meetings at [city name], and a lot them live in different districts, if they catch one in other districts, if they can catch one there, fine, and if not, they tell me and I will come on location and give them one. Get their name on the list. (S-12)

This supervisor was able to find the time to visit the rig sites and help his employees learn about safety. According to the views of the employee participants, this type of activity encourages employees to work safely.

A second theme to emerge from the employee participants was of leaders caring and being concerned about their employees' safety as a motivating trait. Employees

wanted a leader that would not put them in harm's way and make them feel that they were valued beyond just being a resource to serve clients' needs. One employee participant stated it well by saying:

> Just the fact that I know that they are not going to push me to do something that might get me hurt. Whether it was company policy or not, they are not going to make us do something that will get us hurt. (E-15)

The underpinning of this trait appeared to stem from two major avenues, good relationships, and good communication with employees. Employee participants identified both mechanisms as ways in which the supervisor let them know that he or she cared about their well-being. The concept of a strong relationship where the supervisor took time to learn about the employee personally and was interested in their families emerged. Several participants commented about the strong relationships that currently existed within the work group in a very positive manner:

> Why I think that he is just that type of person inherently that he does care about his employees and does want everyone to go home safely; and secondly, but just as important is that what it means to the company that we have a low incident rate. (E-1)
>
> Because we all work so close together, we are kind of like the family atmosphere, (you know) so we care about what happens to our fellow employees. (E-3)
>
> Well (you know) like I say he's, I'm sure he's concerned about it, (you know) like I say if there's anything, then I'll go in and talk to him about it (you know). He always has an open door, (you know) say this, what do you think about this, what

> do you think about that, (you know) and he'll talk to you about it; he won't just blow me off; that's me. (E-6)
>
> Well I mean, it's, I work with these guys every day, I know 'em, I know their families, I mean you can't help but I think feel responsible if something happens, I don't know how to answer it other than that. (S-6)

The second underpinning of the care and concern category was the concept of good communication and people skills where the communication aspect enabled the people orientation. Leaders described with this trait would use their communication skills perhaps over their relationship building skills to impart the message of care and concern. One participant tied these thoughts together well through a comment about a previous supervisor that was seen as caring and concerned:

> The one I had before was very much people orientated; (you know) he cared about the people. We would go out for safety dinners, about once a month…and when we would go on these then we would talk safety (you know) with the group…it really uplifted the employees and (you know) it made them feel pretty good that he cared. (E-4)

Communicating their concern about employees was a direct way to inform employees that the supervisor wanted them to work safely and not get injured. The following participants described this:

> I think, I think it's the fact that he talks to employees, and consciously stresses that he really cares about their safety, so (you know) it's mainly the communication with his employee, the open communication. (E-3)

I think it's more of a management instilling into their employees the importance of it and finding a way to reach everybody when they hear them that it's in their best interest to be working safely to make sure that they go home every day. (E-2)

Ya I guess, ya that would be about it [communication]. I think if they do tell beforehand 'hey when we do this…I guess have the tool (you know) the tool box talk beforehand on the activity that we're gonna do. Which some rigs, actually [names company]was really good about that, which kind of seems odd, but [names company] would make everyone stop and do a, I mean you stop and do a JSA [job safety analysis]and everyone involved would be … okay this is what we're gonna do, this is where you're gonna be standing, this is where you're gonna be standing, you're not gonna be anywhere near here because you're not a part of this and they were really good about that, they were..people would get aggravated working for 'em because you would have to do that to do any activity. It was, awe you gotta be kidding me, and then a JSA but …part of 'em know how to talk about it, how to bring it up and doesn't see it as that big of a priority until afterwards (you know) has other things, getting things done efficiently is more important; well not more important but what they're thinking of, it's priority in their mind, ya. (E-5)

I mean, and I hate to say this I was a supervisor for almost eight years and (you know) you go in there and you, to me to be a good leader you've gotta know 'em one on one, you gotta go in there and you gotta talk to 'em; you just can't tell someone a task and say go do it. (E-7)

It was apparent that the employee participants tied communication and people skills closely when they identified a caring and concerned supervisor. As an example supporting this view from the opposite perspective, a participant described an uncaring tendency when the communication skills were poor.

> People skills are very important, if you don't like that person then there is no reason even trying. If you can't sit down and have a decent conversation without going irate, going over the top, making a person already in a bad situation feel worse than it is not a pleasant experience for anybody. (E-10)

The last theme of leadership identified as promoting good safety outcomes revolved around promoting safe behavior through celebrating successes or the positive reinforcement of safe behavior. This activity was especially relevant when employees went to great lengths to work safely such as when they had to make difficult decisions like stopping work at a client's location because of an unsafe situation. An employee participant describing an event illustrated the level of effort involved in stopping work at the rig site. Not only did the employee have the courage to tell the client that the work site was not safe, he had to conduct research for the client to prove the case.

> An issue with a little independent okay, and what we saw him do, our employee saw him do was when they rigged up the rig, the guide wires that they used to tie off the rig (right) they were going to tie them just to a mesquite tree, (okay) instead of (you know) having the dead man stakes at the corners that they tie off into, they were just going to tie off it to mesquite trees. So our employee shut the job down and the customer kind of got upset that we did that. And we ended up

> getting me involved and getting in contact with him, and he kind of wanted to know what we based shutting the job down on, and I told him we, (you know) it's kind of industry standards, that you don't tie off to mesquite trees, and he said industry standards what do you mean; well I contacted my friends with [names other companies] and got the API [American Petroleum Institute] standards for dead man and tying off and what the rules were. And then we went back to the customer and talked to him and he said okay we can do that, so what they did is they ended up getting out there and trying to locate the dead man's and they couldn't find them, they actually set new dead men on location so they could pull the wells, they went ahead and they shut down for two days because we were gonna do three wells in a series. And so they went ahead and checked all the locations to make sure they were proper and then we came back and did the jobs. (E-3)
>
> That feels really good, (you know) the service tech in that area was glad we got that remedy for him (you know) and its just showed us sometimes when we work with the little independents we have to bring them up to the standards of the larger companies. (E-3)

In this case, the employee was recognized and acknowledged and expressed a level of pride that resulted from the recognition.

Interestingly, stopping work when conditions are unsafe is an expectation of all company employees, a well understood program in the industry (pers. obsv.) and it was well understood and explained by the study participants, for example,

> Typically, yeah, there is enough focus on safety even if it is not always followed if somebody tries to shut it down, shut down the operations, because we are not the only ones to have a stop program as most of the rig companies have one as well so usually they do respect that if somebody speaks up and says, hey…and they really do take notice and try and find a solution. (E-11)

However, stopping work at a rig site is not always positively received by the client or even other employees. Other rig employees can see it as an interruption of their work especially if any time-based bonuses are paid. Typically, employees must stand up to the client and stop productive work; this difficulty was illustrated by several of the participants:

> I think so, but I have never tried to use it so I don't know how it would work, with the oil company. I think within our company no problem, but within the oil company they preach it at least the one I work for, but if you … that pulling unit operator actually said it's unsafe with the car lights, I'm not sure how that would go over, expected to pull the wells at night. (E-1)

> Well, when I was out on location once, um we were about (you know) ten feet, I was standing with the company man about ten feet away from the rig, the rig was overflowing, so water was (you know) coming out, not water but fluid and um (you know) the company man wasn't wearing his safety glasses so I (you know), I just casually mentioned like 'would you like me to get you (you know) some safety glasses, because I noticed that the rig's overflowing' and um (you know) I would hate it if something got into your eyes and he kind of (you know) brushed

> me off, he looked at me, he stared at me for like a minute at least, and a minute is a really long time and uh then one of the other guys kind of (you know) said (you know) jokingly a comment and it kind of got defused um he was just like 'no I'm fine' but (you know) that was very nerve racking. (E-8)

The peer and client pressure (real or perceived) can weigh heavily on the employee and supervisors can easily underestimate the difficulty employees have in conducting this process especially if they (i.e., supervisors) are very supportive of the Stop Work program or if they rarely visit field locations. Consequently, when supervisors do support the employee Stop Work efforts, it can feel like a celebration or positive reinforcement of the right safety behavior.

> Ya, we was out in shipping one day, on second shift you had the whole group, you had shipping, you got stockroom, you had the whole machine shop, assembly the whole works, and we was out in shipping one evening and they brought in a truckload of cable reel and we had to put units on that truck and the cable reels were in the back from which we loaded from and the guys were having, they'd take a hoist and they were having to climb around those, and we stopped work right there, I stopped it (you know) I told them you can't do that that's not safe, and our, my supervisor just happened to be standing there (you know) and he said hey good call (you know). That made me feel pretty good. Right, we stopped it and we figured out a different way to load the truck that was safer. (E-4)

The theme of celebrating successes also emerged when employees described existing behaviors or activities that resulted in positive feelings of appreciation by the

supervisors. For example, even when they were simply complimented on a good job because they were working safely.

> He was always (you know) kind of cheering you up and that motivates you a little bit, when you have you boss to say you're doing a good job or (you know) you're working safe, keep up the good work, (you know) that's kind of motivating. (E-4)
>
> Might compliment, might say it more often, he recognize you that you were working safely. (E-13)

Other times this leadership trait was acknowledged when employees made suggestions for changes in their work to make it safer and the supervisors supported the changes and approved of the efforts. For example,

> I do know one time we done some better job on rigging our trucks up to be able to deliver chemicals in a safer way. As far as in more hard-line instead of using flexible hoses we use more hard-line that way you don't have the risk of any kind of back pressure building up and it blowing out possibly. Suggested to a manager, we kinda of done it as a collective thing amongst the drivers and we kinda run it by him and kinda done it. He was supportive. I think we did (feel good); it's just a little bit better delivery system, that's the best way to kinda of way to explain it. (E-9)
>
> Like he does rewards, like we have safety observations that we're suppose to make in order to like, it gives [the company] a handle on (you know) our incidents and stuff. And for the best, not the best, but I guess for the best one of the month he awards more points to, points are things you can like buy stuff on line with, he

> does give you points if you do one, so I think he encourages the reporting of safety observations either negative or positive. (E-8)

This theme also emerged in the coding of employee responses related to what they would like supervisors to do differently to promote safety. One participant provided a detailed response and even went beyond the supervisor to the local working team celebrating successes as a mechanism for encouraging safe behavior. With his comment, this participant illustrated the tenants of prospect theory described by Kahneman and Tversky (1979) whereby individuals tend to underweight the possible consequences for the probably outcome and overweight the likely or perceived certain outcome.

> I think it [celebrating successes] could help, it could help and it could even be within our crews, you know, we've got typically at least, there is a little bit of a hierarchy, directional drillers are kinda of the leaders on location, and the MWD [Measurement While Drilling] hands are kind of a support role. In particular, if the lead directional driller made a point of stressing safety and then complimenting the MWD hand. Because, even though we work more in the line of fire day to day, being on the rig floor and stuff, but the MWD hands have more equipment to rig up and down at the beginning and end of the job. And that occasionally can put them in a situation where they are tempted to take shorts cuts and make someone take more risk. Try to run cables to places that are difficult to get to on the rig floors. That is what I did for eight years and that was probably the most dangerous part of the job. And if the directional driller would maybe take note of their safety practices and compliment them when they are doing a

> good job, that could make a difference. (E-11)

Consequently, celebrating success was described as motivating when it happened even if it was a rare event and depicted as a means of increasing safety motivation by increasing the frequency of the celebrations.

Beyond the three themes that emerged from the data provided by participants, a contrasting view to leaders motivating employees to work safely was the position that employees worked safely because they were self-motivated. They did not need a supervisor or other leader encouraging them, they were going to work safely for themselves. A couple of the participants described this position directly,

> I don't, I don't really get my motivation to work safely from my boss, it's not anything against him, it's just more internal for me. (E-8)
>
> I don't know his motivation is what gets me to work safe, I think it's more motivation that comes from myself just to make sure that I'm doing everything safely to make sure that I don't get injured personally. (E-2)

The theme of self-motivation emerged a couple of times in relation to working safely and may be an example of tapping into a personality construct of conscientiousness. I did not specifically investigate this personality trait, but it is referenced in the Christian et al. (2009) model as an aspect has been shown to influence safe working behavior.

In summary, employee participants described their idealized view of leadership traits that motivated safe behavior embodied in leaders that participate in the process and lead by example, leaders that are caring and show concern for the employees' safety, and leaders that celebrate successes in a manner that positively reinforces safe behavior.

The second aspect of the research question was related to the leadership traits that supervisors believed were important to motivating safe behavior and ultimately improved safety performance. Their responses were directed towards their own supervisors and thus I was able to probe the leadership traits at two levels of management, first-line supervisors (i.e., employee participant responses) and managers (i.e., supervisors' responses). Data provided by supervisor participants emerged into a model of an idealized leadership style that consisted of four categories. Three of the categories were similar to those described by employee participants in their idealized leader, namely someone that leads by example and participates in the process, a leader that shows care and concern for employees' well being, and a leader that motivates employees to exhibit safe behavior through celebrating appropriate activities. This third overlapping trait did not emerge as strongly in the supervisor data as it did in the employee participant data. I also identified a fourth aspect to the model from the responses provided by supervisor participants, namely leaders that are good communicators especially around the importance of safety.

This overt description of communication as an important trait was different from the employees' view as they did not tie this trait directly to a motivation activator, but they did see it as an underpinning of a caring supervisor and did indentify it when considering what improvements supervisors could make to motivate safe behavior. The diagram (see Figure 2) depicts the supervisors' idealized view of leadership traits that motivate safe behavior.

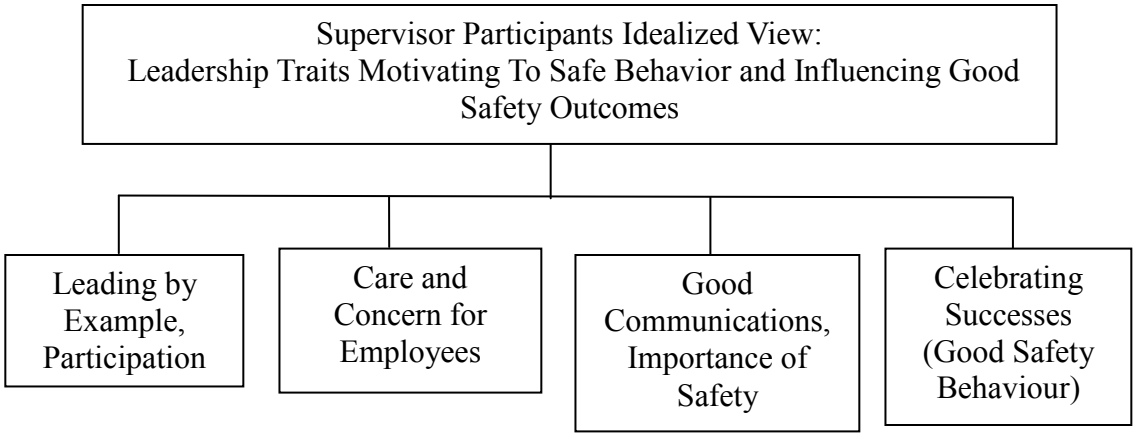

Figure 2. Idealized leadership traits identified by supervisors as driving good safety behavior and performance.

A participative leader is one that both employee and supervisor participants identified as motivating safe behavior. One category that jumped out as crossing the employee, supervisor, and manager boundary was worksite visits and specifically well or rig site visits. The participant responses ranged from no visits, to a few visits that did not include a conversation about safety, to a supervisor conducting safety meetings at the rig site for employees that missed the warehouse meetings (see previous in vivo code). Most participants agreed these (i.e., rig visits) were good to do, but no one thought they were occurring frequently enough.

Rig site visits, when they included discussions about safety, were seen as a high level of participation on the part of supervisors and managers and of course employees. The barrier to increasing these visits by supervisors is their number of direct reports. In this study, the supervisor participants generally had at least 10 or more direct reports (10 of the 12 participants) and 3 supervisor participants had more than 20 direct reports. With this business model, they likely could not get out to the field very frequently so a

decision would face the organization about this form of interaction and whether another form (e.g., social networking as suggesting by an employee participant) would help fill the void.

In general, supervisors were straightforward when describing the importance of leading by example or participating in the process. Several participants voiced their positions as follows:

> We should start at the management level. Period. We cannot have a successful HSE program if the managers are not living the culture and I'm sorry but I believe that whole heartedly because if the managers can't do it how do you expect his operators, his engineers, his crew, his employees, his direct reports, how can you expect them to follow through if he can't, and he isn't. If they have interactions with a field person, they need to be living it. If that field person sees [names a leader] walk through our manufacturing facility without safety glasses on or steel toes on, or hard hat, or coveralls, how can I have that employee come back to me and say well they don't do that in [names a city]. (S-4)
>
> Lead by example, plus being learner, we have to let them know what we have heard or what we come up with. (S-2)
>
> I guess by doing (you know) and showing, and he's talking safety a lot too so I mean it's a combination of everything I think. (S-5)
>
> I just, my biggest deal is lead by example. That's the biggest. The employees need to see you doing the right thing before they do the right thing. (S-9)
>
> Participating is a trait that would pop to my mind that, if you are participating in

> the safety environment than you're gonna be more recep.. people would receive your message a lot better if you're more participating than telling, and if you're having to be in a selling mode, then that persons really not caring about their safety anyway. (S-4)
>
> They would need to be more involved, I would want 'em involved more personally, not just procedural, cuz right now it's a procedure, and that's what they're focused on is the procedure, and sometimes you have to get outside of the box, so I think they need to have more hands on and actually do and get involved. (S-6)
>
> Maybe take the training classes that we take a little more seriously. Maybe make people go to more training classes. (S-1)

The clear picture that emerged from these data was that supervisors' wanted leaders that were committed to safety and set a good example for employees to follow while allowing them to participate in the process thereby helping the supervisors to learn for themselves how to be better safety leaders.

Care and concern for the employees' well being emerged from the data provided by supervisor participants as motivating to safe behavior especially when related to the question of how to keep employees from being injured. This trait was often associated with a people orientation, knowing an employee better than just a work relationship. Care and concern came through from the participants in the following manner:

> I think the people skills, seems like the better everybody can work as a team and can work together there is less friction and less chances. You got someone

> looking over your shoulder trying to help you out and prevent an accident. (S-12)
>
> I think just being personable and (you know) cuz a lot of times I talk to uh I basically talk to everyone about something outside of work, um (you know) more of a personal thing (you know) one of my guys is fixing to have a little baby another (you know) his girlfriends been going through some medical problems, and they're… (you know) just being involved in the more personal side of what's going on and not making it just hey I don't care what's going on(you know) you need to be here doing this so it's a, that will probably be it. (S-7)
>
> Oh ah probably more of a people person, and (you know) he's real high on safety too, so I mean you want to do everything for your boss (you know) to make sure you have a safe work place. (S-5)
>
> He is better than me, when FRCs [fire retardant clothing] first came out, he said we had to order it. He's got, he dedicates himself, when goes out to the field, he is wearing them. That and he cares, he's involved in the safety stuff. He is the one taking the time staying up to 10 or 11 at night trying to figure out about the chemical stuff. He is very dedicated. He cares, he really cares about people, he really does. (S-2)

There was one supervisor that described a caring and concerned leader in terms that can be related to servant leadership.

> Leadership traits, well, I think they need to be focused on the employees, more so than themselves, I mean that's to me, that's it, I mean that's a big thing. (S-6)

In at least one case, the importance of a caring and concerned leader came through in the

negative approach to the topic when the participant's current supervisor apparently did not exhibit this trait.

> No he wasn't people orientated, he, they, when they get into positions like that, it's more like (you know) what they can make you to do; to make them look good, so I'm gonna just leave that one alone. (S-6)

Caring and concerned leaders were described as showing an interest in the employee's well-being through a related concern for the employee's family.

When supervisor participants discussed the importance of celebrating success, no one used the term inspirational motivation, but in analyzing the codes, I identified many similarities between the participants' conversation about the importance of celebrating successes and inspirational motivation. Although this aspect did not emerge as directly in supervisor data, and no one thought it was unimportant, a dichotomy of whether it was practiced enough came out. Some supervisor participants said that their managers did it, others that they did it, but not strongly enough, and still others had managers that did not do it at all.

> Very supportive with things like that, very encouraged and uplifting. This wasn't a safety moment but it kind of illustrates it, um we had a guy out on the rig and we had a class of trainees come through to his rig, and he had everything very neatly organized for them, paperwork deal, touring the rigs explaining things (you know) um and all we recommend him for a gold award, and he's very supportive and encouraged that we have that quality of people out, so he's very proud of those things, an Atta boy he's certainly supportive and wants to do that… with it.

(S-8)

He says good job, like I said we try to implement an award system, where we just award the people for doing a good thing. We celebrate, we try to give people an award in front of everybody at the safety meeting. I have ordered a couple of tee shirts from the (company) store and I gave away a few of them last week to employees for doing the right thing where safety was concerned. (S-3)

He is happy about it; he talks to the employees about it. It is brought up at the monthly safety meeting. If the employee is not there, it is passed around. We might have the employees say you did good observations. (S-2)

Him and I are both big believers in the carrot system we use the recognition awards. We both use those. We have a thing in place right now that whoever can turn in the best observations until the end of the year, the most quality and stuff gets a gold award. (S-9)

Several were clear that it needed to be done more frequently.

Give the employees a little gratitude for being safe. Thank them. A thank you will go a long way. Well, but not frequently enough. (S-12)

I will say the few times we have had conversations over safety issues, I think he has been very supportive of what our decisions have been. (S-10)

I think there ought to be safety recognitions. (S-8)

As can be seen from the in vivo codes provided above, the majority of the conversation around celebrating success came through when supervisors were describing how their managers currently interacted with employees. These episodes were generally

described in a positive fashion, but in at least once instance, the supervisor identified the lack of celebrating successes as one of the issues keeping safe performance down.

> To me that's the problem [company name] got, they don't, I'm not saying [company name], scratch that one, some mangers, they never, ever, and this is my past managers, never ever acknowledge the safe behavior, it's always when something happens, oh god, what happened, what'd you do, (you know) it's always about when something happens it's never about observing good behavior, ever once awhile I try to make a point on myself to write up an HSE card that I observed so and so wearing a seat belt on the forklift, well (you know) I try to, I don't do it as often as I should, I'm guilty but I try to make sure it try to focus on the good things and not always the bad. (S-6)

The final category of the idealized leader is one of good communication around the importance of safety. This category emerged directly from the supervisor participant data, but was indirectly included by employee participants when related to the importance of care and concern. To the supervisor participants, this trait seemed to be at the heart of the leadership question as nicely illustrated by the following participant.

> I think, communication is probably the most important leadership trait. When you are talking about whatever it is, when you are making a group decision, it is very easy to interject safety concerns into that decisions in which they are not actively part of making those choices. Instead of me just deciding how something is going to be done and then forcing it on them, we all get together, we all discuss the risk, the options, what the best way of doing this, how do we store this equipment

> everybody is involved in the conversations, everybody is involved with the safety concerns and everybody is involved with the solutions. I think that is the most important. (S-10)

To other participants, the trait was more about the providing information as a measure of a level of commitment to safety. Simply talking about the topic of safety was seen as motivating better safety behavior.

> He is constantly sending out emails about expectations and this happened at this base and what can we do to prevent it from happening again. Make sure it doesn't happen again. It's pretty good communication and this gives me a level of his commitment. (S-11)
>
> By talking about and doing, in safety meetings and different things of that sort. (S-5)
>
> Anyone can bring up a topic, from home, from transit, if phoning while driving. I was driving this morning and then I saw somebody texting and we will use it to remind everybody talking on a cell phone is not only against company policy it is also against the law. We take topics from everywhere not just wireline. (S-3)

Sometimes, the importance of communications came out through the frustration of the opposite reality, for example, when there was not good communication from the leader. It appeared that a level of communication that was perfunctory or very reactive was not seen as motivating.

> He asked if we had any HSE related incidents and the answer was no. How are we doing on financials. (S-11)

> My honest opinion is my perceived view of it, I'm trying to be careful here too, well just tell me it's not going anywhere, but I'm gonna just come out and tell you, I think what they want is not to have to report an accident or an IRB because I don't hear them preaching safety to me like I preach safety down, it's more of a dictative type deal hey stop your guys from having accidents deal it's not like let's have a safety moment or let's, they don't, I've never heard them say anything like we need to give out safety awards or let's let's do this, or hey let me come up and do a safety meeting or this, so my gut deal is, just avoid it you know you got to do it you do it. (S-8)

> It was okay with me, he didn't take it very well, he's p'oed. Oh ya. It was one of those "Just tell them to call me. I'll take care of it! (S-4)

These last few examples illustrate that just any communication in itself would not be motivating, the communication had to be proactive and positive to meet the idealized version of leadership described by the supervisors.

Similar to the employee participants, there were several contrary views in terms of an idealized leadership trait. For example, one participant believed that task-oriented leaders would motivate safer behavior. This participant stated:

> I would say probably the…task part, the person would say would say, hey that is not the right way to do it, somebody that would actually tell you wait, more direction if you are going to try when you are learning, when you are young, he would show you when you are learning he would say hey, I think you need to do it this way. (S-1)

Also, similar to a few employee participants, two supervisor participants believed that his safety motivation came from within and not from the supervisor.

> Personally no, I'm gonna do that on my own accord, I'm going to work safely. (S-6)

> No, and I don't mean that in a derogatory sense, it's just that I don't think anything other than my own personal experiences make me I don't think there's anything he can tell me, and I don't mean that they way it too, quite as vane as that might sound but I mean you know you go through life like I have, I'm lucky that I'm alive so (you know) I don't need any motivators to stay alive and to keep people alive. (S-8)

The idealized view of leaders promoting safe behaviors through the eyes of supervisors includes leading by example or participating, showing care and concern for employee well being, exhibiting good communications to support safety and encouraging safe behaviors through the celebration of successes. The views of employee and supervisor participants regarding the idealized view of a leader that would motivate safe behavior leading to improved performance were very similar. All of the same themes emerged and the differences were only seen in degrees of nuance.

To summarize the findings in response to research question number one, employee and supervisor participants agreed that leading by example or being a participative leader and caring for employees were two leadership traits that would motivate safe behaviors and ultimately drive better safety outcomes. Employee participants believed that celebrating successes as a means of encouraging employees

when they exhibited appropriate and safe behaviors would be an important leadership trait. This category did not emerge as strongly in the supervisor data, but they did support the aspect. The supervisors emphasized a trait of good communications especially around the importance of safety in their supervisors while employee participants only indirectly developed this trait while describing the mechanics of a caring leader. For example, supervisors described a leader that was a good communicator and supported safety verbally while employees described this trait related to an underpinning of the care and concern concept. Overall, there was good agreement between the participants in the general categories, but it is important to note that leaders should understand and elevate the importance of celebrating success of good safety behavior as a means of positively reinforcing this behavior in their employees. The second research question continued to probe the manifestation of leadership traits in the U.S. land operations of the target company.

Research Question 2

How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

Realized view of leadership. Employee participants described their idealized view of leaders motivating safe behavior as those that participate in the process and lead by example, leaders that are caring and show concern for the employees' safety, and leaders that celebrate successes in a manner that positively reinforces safe behavior. In analyzing the data provided by participants on the actual state of leadership traits, the

following picture emerged. Employees viewed current leaders in one of four main categories, two of which, participative leaders and those showing care and concern, were included in their idealized state of leadership. The third category was a composite of the other quadrants of situational leadership, namely, delegator style (low relationship and low task focused), seller (high relationship and low task), and teller style (low relationship and high task). The fourth category, classed as a lack of leadership, where the leader was essentially absent from interactions with employees. Overall, the realized version of leadership traits consisted of a broader range of constructs starting with a lack of leadership that was described with surprising frequency.

> To be honest, our supervisor has no skills, no people skills, no management skills, no timeframe skills. (E-10)
>
> I don't know my new supervisor at all, and I have never met him. This is just a month ago, but the prior one, supervisor for a year and one-half; I really don't know him well. I met him a couple of times in the office and spoke on the phone, but I really don't know him well and can't say what kind of leadership traits he has. (E-11)
>
> I've been working for this particular supervisor for oh right about seven months now and I've yet to talk, see him anywhere on any job and the only time I talk to him is when I'm going to a job and its short and sweet… 'go to this job do this, this is it, and we'll email you the rest' so (you know) we, there no, there's no… interaction … interaction whatsoever. There's no confidence building on how you're doing, call you up and ask you about your job or anything like that it's just

short and sweet, bye. (E-7)

In reviewing the background of the participants citing a lack of leadership, the common thread to the comments about the lack of leadership was a particular product line, directional drilling, where the employees typically moved from job site to job site without returning to a company base of operations. In this case, communications were minimal between employees and supervisors and generally consisted of job instructions or directions and little or nothing about safety. One participant (E-5) responded with "nope", "never with a supervisor", and "never" when asked about safety communications, safety meetings, and visits to the worksite. Another participant (E-8) responded that his supervisor did not help him learn about job hazards and that his supervisor had not been at the worksite. Other participants in the same product line had similar comments.

Turning to the other leadership traits described by employees as overlapping to their idealized state, were supervisors that led by example, or in other words, participated in the safety process. For example,

> Probably he has a lead, lead by example person; I know we recently pushed, well not pushed, but required that people attend the safe land training that we go through, and then like here in the [location named] our major oil companies each have safety leadership training that employees go through, supervisors go through, and what we saw is that tended to be better than the safe land training that we went to, that everybody is saying after they went through that is well this is the basically the same stuff we did here, so why are we doing this, so we tell

> ‘em well repetition eventually (you know) if you do it enough you going actually, and it’s going to come second nature (you know) it’s kind of like that, but (you know) they were all saying it’s the same training we get the same training over and over and over and over. (E-3)
>
> By how they did, by example, they would always work safely and (you know) there was never a reason why we needed to not work safely. (E-5)
>
> I guess through we do a lot we try to keep our facility pretty clean and that repetitive thing over and over like making sure this drum is properly labeled, all this stuff stays shut. We kind of do it as a collective thing with everybody knowing what is going on from his standpoint as well from ours. (E-9)
>
> Setting a good example as well. I mean he wasn’t always a supervisor he was in our shoes at one time too. He kinda knows how things go and what can happen. From his experiences he teaches us things that have happen possibly to him or someone he knows in the past, and he teaches us to try and help us move forward. (E-9)
>
> He’s more of a hands-on guys, you will see him out in the field if we are short on hands, and you will actually see him go out and work. (E-14)

These supervisors were seen as being able to empathize with the employee’s situation because they modeled the way for them and they were described in positive terms. Many employee participants provided details on how their supervisor lead through example and a majority identified wearing PPE as the primary example. Comments such as the following were common:

> Well, when he is in the shop he puts on his safety glasses and he has his steel toed' on. (E-12)
>
> Well he's got his safety equipment on, (you know) he's… that's all I can think of. (E-4)
>
> I guess, doing the stuff the right way the way it is suppose to be done. Whether it be our FRCs or our gloves or face shields or goggles, or whatever it might call for that particular activity or that particular job. Doing like it needs to be done and us seeing him doing it makes us want to do it the right way to keep safety in mind. (E-9)

Wearing appropriate PPE is a company and a regulatory requirement in the U.S. (Department of Labor, Occupational Health, and Safety Act) and would be considered a compliance aspect in the Christian et al. (2009) workplace safety model.

The second overlap of the idealized state of leadership to the current state included leaders that showed care and concern for their employees' well being. These supervisors were not only familiar with the employee's situation, but also interested and knowledgeable about their families. I perceived close relationships that moved beyond the boundaries of the supervisor-employee work relationship. Participants described actualized leadership in terms of caring and concern.

> I mean, yes, as far of resolving issues, ya, that's kinda how we work here at this base, everything is kinda of casual, everyone is kinda of friends or acquaintances. The area is small so everybody knows everybody. We sit around more as friends and co-workers. More than people, that just work together and go home.

> Everybody is more relaxed, everybody kinda watches for each other because we know each other's families. That's what I am saying. (E-10)
>
> If we have something personal going on, it is they will bend over backwards to see if we could get our end of it taken care of too. (E-15)
>
> He relates that, that he wants everyone to go home safe, and I think the main reason is he does want everyone to go home safe, that's best for the customer and the company if everyone does. (E-4)
>
> Personally I think that a lot of it has to do with him having kids of his own and me coming in and being… oh yeah I'm not as..I'm older than all of his kids are but I think it's more of like a parenting type like feeling that he has, that I'm new and that I'm quite a bit younger than he is and kind of sees me as one of his own kids almost. (E-2)

The final traits emerging from the data were a composite of items that fit the delegating, selling, and telling categories of situational leadership. This broad spectrum of leadership qualities and styles is not unexpected with a sample of volunteers that spanned numerous product lines and geographies. Examples of the various types of leadership traits described by employee participants are provided here.

> I'd say he is fairly laid back in his approach, once he, he'll put out what he expects you to do and as long as you're keeping up and letting him know how things are going, keeping him updated, hell kind of stay in the background let you do everything, if you have any questions he's very responsive and very knowledgeable so he's more than willing to answer any questions and if you have

any problems he's more than willing to help. (E-2)

Right, right, ya I want to say, that definitely, he's definitely task orientated, and um very much a people person, um (you know) and like I say safety orientated too and so that's ya. (E-6)

He kinda knows how things go and what can happen. From his experiences, he teaches us things that have happen possibly to him or someone he knows in the past, and he teaches us to try and help us move forward. He is kind of detail oriented as far as missing anything that might happen he wants us to pay attention to the small things. (E-9)

In general, there was overlap between the idealized view of leadership that motivates safe behavior and the actual view. The overlap was not complete and a number of participants described an absence of leadership. However, when employee participants were asked what they would like to see their supervisor do differently to improve safe behavior, a surprising number of them stated that either they could not think of anything or that they did not think their supervisor should do anything different. Specifically, eight participants held this position. The other participants did describe increasing the aspect of leading by example or participating, showing concern, and celebrating successes. For example, related to participation in terms of worksite visit, an emerging concern was that when the supervisors did go to the worksite, they did not always take the opportunity to discuss safety with the employees rather they talked about the technical aspects of the job or to the client.

Ya, well I think this was just a client visit, (you know) and we were there and he

> just came to visit us too. (E-6)
>
> Oh yah they signed the JSA and we just pretty much talked to the company man saying like what we can do and we did talk about like what was, no we really didn't talk about safety, it was just pretty much how we were going to progress with the job, and what we can do to provide service. (E-8)

This missed opportunity to discuss safety at the worksite impacted the view of participation and care and concern of the supervisor by the employee.

To determine how supervisor participants believed leadership traits (their own) manifested in U.S. land operations, I questioned each of the supervisors to describe their leadership traits to determine whether their view was aligned to the idealized view or to the actual view presented by the employees. Supervisors most often described themselves as participative or leading by example but with a focus on being task oriented.

> My leadership traits are along the people side, I am an engineer by training so I am detail oriented, but my strength is the fact that I don't make any decisions on my own without making sure that everybody has a voice and usually I will force them to give me their opinions before I do anything. It does two things, one it makes them feel like they are part of the decision making which is I think is great because they can't complain when it is a bad decision. And second I am not right all the time and very often I am not and it is nice to hear their opinions. (S-10)
>
> I'm constantly looking for a safer and more efficient way of doing things. We're constantly changing stuff. I don't believe in the philosophy of if it ain't broke don't fix it. I'd like to think I was proactive. I think I am a participative leader.

> I'd say probably more on the tasked focused. (S-11)
>
> I would say, I think I do good as far as getting along with people, I do catch myself sometimes, if I am really busy and if I have an employee to just talk, I wander away from it, I tell them that during their reviews that I need to get better at that. It might not mean nothing to me, but they are saying something and they come in to talk. I am busy, I probably don't spend enough time, okay I need to stop here. I do need to get better at this. I explain things well, I try and be organized. I do not if there's a cost that needs to be done, yeah, anything high cost I take that to a manager, whatever, but if there is something they need the proper tool or proper PPE, I'm getting. I am going to let them go out and do something without. I think they know that. I know they know that, because I had three employees that came from a different area and I went out and got them their PPE and they were really impressed. (S-2)

One supervisor described a particularly proactive example of a participative approach in working to improve safety conditions for employees. This supervisor used past experience in a different geographic location to tackle a similar problem faced by employees in another geographic location.

> One of the things that we did when I first got here and part of it was from my experience coming from [names country] was we implemented driver, journey management for driving in winter conditions here, I have made sure all the trucks not only have all the standard safety equipment, the first aid, the fire extinguishers, but we also have cold weather packages that we put together which

include blankets and water and flares and things like that and it has gotten to the point where this winter there were certain rig locations here that have limited cell service so this winter we are going to get satellite phones so they have them in the vehicles so if these guys if anything happens at all they are able to get hold of somebody whether it is rescue equipment or personnel or the district or whichever and the other thing is when we have the snow storms. (S-10)

A number of supervisors described themselves as people focused or as aligned with the idealized version of a leader motivating safe behavior as a caring and concerned supervisor. To them, relationships were important and promoting safety was one of the ways that they believed relationships were enhanced.

Relationship oriented, care about employees, care about their well-being. At first, the new hire courses spend a lot more time going through the safety stuff and explain things. They have the HSE and HR orientation that provide a lot more stuff. I was thinking of sitting through the HSE orientation and the HR orientation because I would like to see what it's about to where if they have questions after, maybe I can answered without going through HSE and HR. I don't know what they are going through when they go through those things. (S-2)

Well I do feel like I'm people orientated, I try to coach and not just tell people things, does that make sense. I try to mentor when I can, I'll share my experience with anybody that wants to listen. I do get involved hands- on if I feel the need, I'll do it in a heartbeat, I'm not gonna ask someone to do something that I wouldn't do, I mean that's the only way I know how to answer that one. (S-6)

> Yes, because it's my job, I'm I, I think that's why I'm here, is to observe and pay attention to what's going on to prevent anything, from any kind of harm or incident to happen because if I'm not paying attention to what's going on I know they're not gonna pay attention to what's going on, so I kind of take it personally, on that kind of a thing. I honestly do care about their safety (you know) because like I say I've come through the warehouse where they're at fifteen years ago, probably wouldn't be the same environment that it is now, because there was no, fifteen years ago, there was basically no HSE no safety modules or anything that was going on it was just hey get out there and do your job, (you know) so just the different environment that I've come through has I guess led me to, to be the way that I am. (S-7)

When the supervisor participants provided responses to the leadership question with comments about good relationships, I probed to determine whether a range of good to low quality interactions were in place that would be akin to leader-member exchange theory where leaders created in-groups and out-groups through differential relationships with followers. With a few exceptions, most participants believed their relationships with the employees were about the same. In other words, there was not an expressed notion of an in versus out-group from the supervisors. The first in vivo code is from a participant that was an exception; this participant also put a lower value on relationships in general.

> I would say professionally they are all the same in my opinion. But, personally I think they are different. Some people you just connect a little better than someone else. Even as a human being I try not to step in the way of my business,

> in my way of doing it for example is when one hundred percent distinction between my professional life and personal life... I don't associate, once I am done with a day there is no one that I work with that I take to my personal life, and every time that I have ever been invited… one of my employees invited me to his house not so long ago and I politely declined. Even though I think she is a very good person I politely declined because I did not want to open that…went to my house for dinner, why did you invite someone over to dinner, there is another guy for example that I would never go to his house for dinner there is no way. (S-3)
>
> I treat them pretty much all the same way. Yes, but I do pay more attention with the ones with attitude because they may be old school and I may have to be a little more strict with them. (S-2)
>
> I try to, I try…I treat everyone the same and equal…at work. (S-4)
>
> I think they're pretty much all of them are on the same, we're all on the same level. (S-7)
>
> No, I like all of the people that I work with cuz they don't stay around long if I don't. (S-8)

Other supervisor participants just described themselves as task oriented focusing on the action required and ensuring that job goals were achieved.

> I was always told that I am more task orientated. That I am not a people person at all. (S-3)
>
> Well the reason I focus on a daily basis I focus on a job that I have on hand and my vision would be to make sure that job gets out, get put together correctly, so it

> can be a successful job, and that's (you know) that's my goal for everybody involved, so I do harp on quality issues and (you know) so hey check everything, double check it if you have to, stuff like that. (S-6)
>
> I am not a very big picture type of person, but can be very detailed when I need to be, I am very high task orientated. I don't always get the big picture, I mean it doesn't always get communicated to me. I wouldn't necessarily say the big picture is safety, because the big picture of safety is pretty much posted all over [names company], I mean that's there for the general public. (S-4)

Lastly, similar to the employee participant descriptions, various other aspects of situational leadership emerged from the descriptions of the supervisors. Supervisor participants described themselves as delegators and sellers. For example,

> I am more of a trusting type, I like to say do the job and then if they have problems I like for them to think that they can call me with any problem that they have. I am not the type that looks over their shoulders and say why did you not do this or why did do that. I am the type that likes to let them say I like for them to venture out and do it and they should feel comfortable for them to call me. (S-1)

Since the range of leadership types was not unexpected due to the broad nature of the study population, I analyzed responses to the questions that further probed the supervisors regarding actions or behaviors related to safety that they would do differently if they could. In this case and similar to the employee participants, almost half of the

supervisor participants would not do anything differently or could not think of anything to do differently. For example,

> Well, probably nothing, no more than what we're already doing. (S-5)
>
> There's nothing that I can think of, if something was shown that what we need to do differently I would be willing to accept or (you know) embrace what's going on, any kind of new change or anything like that, but nothing that I can think of. (S-7)

However, an encouraging theme that did arise from supervisors thinking about what more they could do to promote safe behavior was one of proactive or participative type actions.

> There is always more you can do, I would try to identify more hazards, try to make more well-site visits. Try to read some more of the OTBs [operational technical bulletins] and other bulletins that are put out by the other districts. That's always an issue, try to learn, I hate to say this, but learn, from other people's mistakes in [names company incident management system]. Often times somebody will have an injury in one district and you never hear about and the sad part about it is, I know we have had injuries that could be easily mitigated and distributed between the district before they happen again and they happen again. I think that as a company can do a little better job about communicating between product lines about different hazards and sometimes it is difficult but oftentimes there is a parallel between fluids and wireline, because they do a totally different type of work, but there is a similarity there we all have forklifts and ladders. (S-11)

I would like to see I'd like to see somehow come up with having a field service safety meeting, more of the scheduled type one. Where they are getting information as it goes along I would like them to be able to see some of the stuff the HSE rep puts out for the shop. They miss out on probably 90% of that. Whenever we have a safety meeting, we get about half of them in there and we talk safety and we may have a lunch or something like that. It's not like they can be on their computers daily on email. (S-2)

Doing more conversations with them, more training. Different things looking at hazards, looking for hazards. (S-5)

Probably just the discussions that we have and just to be able to spend more time with everyone and go over things and let them give the feedback and suggestions on what could be done to be safer or what are they seeing that's not safe that we need to correct. (S-7)

I think I would go out there and it would become a little bit more personal the fact that I could go to the field supervisors and say let's go to this rig, (you know) mud engineer number one is out here, let's just see what he's doing and while we're there let's check his vehicle out let's see how good he is with this um let's go to the warehouse let's have this little safety moment let's walk around, let's do the stop deal the observe ring the pointing out type things, and it wouldn't be a...the deal is in my opinion it needs to be so frequent there again it becomes a part of the DNA that every day or two you're talking about it I mean I go back to this, it's like raising kids (you know) you can tell em don't touch it; and if you

> don't keep telling em that some point or another they're gonna touch it until they find out its hot. (S-8)
>
> Devote to more time to face-to-face training. I took more away from the instructor lead training than I ever will from [names training system]. (S-9)

A few supervisors would like to control the hazards that employees are exposed to at their worksites:

> I wish I was in control of the client's well site, and oftentimes wish we were not a service company, but we were an operator, because operators can oftentimes can dictate what they want. Control and address and mitigate the hazards. We do our best, but it would be unrealistic for me to say I could convince the client to spend an extra five hundred thousand to put rock on location. (S-11)
>
> I think one of the things I really would, what I found is how receptive our customers are, I would spend more time working with our customers with some of our issues and getting more involved with their safety meetings. (S-10)

In providing these responses, the supervisors were verbalizing activities that would bring them closer to the idealized leader that motivated safe behavior through employee interaction (participative leadership). Further, proactive, and participatory behaviors such as the ones described in the comments above identified an important aspect of the Christian et al. (2009) workplace safety model, namely, safety participation. The fact that supervisors are at least thinking about these activities as important indicates an understanding that compliance efforts such are wearing PPE and rule following may not be enough to drive injury rates closer to zero. A specific focus on this aspect of the

workplace leadership model is provided in a succeeding section.

I further analyzed the view of supervisors of their managers' style and not surprisingly, a range of leadership styles emerged. Similar to the employee participant group, a large number of supervisor participants described a lack of leadership in their managers, for example,

> That's a hard one to answer because, there's not, I probably don't talk to him over three or four times a month. And usually I initiate the call. (S-8)
>
> He is a hands off he is definitely a hands off, he is actually extremely hands off, we are in the same office but he leaves me alone, we can go a week without talking, he's downstairs, I am upstairs, I take care of my business. I am not quite sure what he does downstairs. I don't mind being friends with him, once in awhile he will say how's it going – I will say it is going, he will say I heard you having this problem I will say yes, so every once in awhile he may be helpful for this or that, I might need to inform him if someone got hurt or if a client was really mad with him, going not as expected, but for the daily things with my guys I just go ahead and take care of it. (S-3)

In the case of supervisor participants, the lack of leadership descriptions were not limited to a single product line, but crossed several product lines.

Supervisors also described leaders that were participative and led by example in congruence with one of the categories of their idealized leadership trait. One supervisor participant described a particularly proactive approach taken by the manager as follows:

> I would say that, one of the things that he does, every new hire that we have, he

> does call them and basically emphasizes our Stop Work policy and stuff like that he does do that which I think is good. I think in general when he is here and he has visited the location and stuff and I think that is how he interacts with the employees, hey, how is it going, stuff like that. (S-10)

Five participants said their manager's cared about their well-being and generally gave examples of how the manager would help them work through problems or was interested in their family situation.

> I can just tell by his actions, I guess, he …if there is a problem he will figure a way, we will get to the bottom of it we always get it solved, if there is a disagreement we figure a way around it, he is always been good about working with me to get the problem solved, something does not sit there and fester for a long time. We get the answer; we get it done. (S-1)
>
> I think he is a generally, generally concerned individual, he is probably just like me, he doesn't want anybody to get hurt, just like me he doesn't want to get hurt because of something he did or did not do. (S-10)
>
> Probably the same because we have the same type of discussions and it's not… everything's not 100% just [names company], it's what's going on outside of our work because I mean we spend more time with each other here then we do with our families at home so it's kind of, if you don't have that kind of relationship. It's kind of hard to be in a place that you're not happy with that you spend 75% of your time. (S-7)

Similar to the makeup of realized supervisor leadership traits, they described the traits

of their managers falling into a variety of the situational leadership quadrants. The telling style was prevalent, but some level of the selling style also came through.

> Telling. Telling. (S-4)
>
> He is more the type that says why didn't you do this, why didn't you do this? I don't how you identify …hands on type. (S-1)
>
> I would say my manager's leadership trait is, he is very, very cerebral, he thinks through and plans and looks at every angle before he makes a decision. Really, detail oriented. He does not involved people in decisions. (S-10)
>
> People person, he kind of focuses in on the details, from what is right there in front of him. (S-12)
>
> Very thorough, very meticulous, he does lead by example, and if you talk to him, he will sit down and stop. He sets a good example for me I am trying to copy. He is…I can't stress how thorough he is because, very dedicated, I will say that…he is very dedicated, very dedicated, not just to safety, but to every aspect. He works too many hours. Very good boss, very good supervisor. (S-2)

One supervisor participant used terms related to transactional leadership to describe his supervisor.

> He supports the base adequately, anything if I make a good business justification of why we need this, why we need to spend 50 grand to spend for this tool because if somebody could hurt their back the indirect costs will be huge, he understands that. Yes, more a dollars and sense. (S-11)

The picture that emerged was that the supervisor participants' managers possessed a

range of leadership traits, but that a telling style seemed to be prevalent. Managers focused on dealing with the tasks at hand which is likely prevalent in a high-tech and demanding industry. The encouraging aspect of the review of actual leadership traits described by the participants is that there were elements of the idealized leader in each of the group descriptions. The discouraging aspect of the review of realized leadership traits was the surprisingly high number of participants that described a lack of leadership. The remainder of this section addresses details related to indirect aspects of leadership and elements of the workplace safety model.

Trust. Through the literature review, I identified trust as a construct that had been found to influence safety performance. During the interviews, the participants responded to a question related to trust and the majority of the individuals stated that they did trust their co-workers or employees to work safely. This category did not develop specifically related to leadership aspects, but did have some underlying components. Employees and supervisors tended to trust as a result of knowing the attitudes of the other individuals, their relationships with co-workers and their beliefs that the individuals were responsible. Only a few participants mentioned having a level of mistrust due to either the lack of experience or attitude.

> I guess one thing is they have a lot of experience out here um a lot of them have been working with [names company] for a long time, and they have a good feeling about what is going on. (E-8),
>
> I think just their attitude, just getting to know them and seeing the way that they conduct themselves around the shop, the way they watch out for other people, like

> I said most of them when they get hired on they start out in the shop and you can see their interactions with other people and you can just tell when someone is watching out for someone else and paying attention to what is going on. (S-10)
>
> I believe they work safely I trust them to I've worked with 'em long enough to know their work habits. (E-4)
>
> I think for the most part I do think they will, but I'm always watching I think for things that might be unsafe not only to them but to myself too. (E-1)

Visioning. An important aspect of leadership is the ability to project a vision of the desired state for the followers that guides them to this desired state. In most if not all companies that have suffered workplace injuries, a vision aiming for a time when injuries are eliminated is logical. This type of vision coupled with other actions (e.g., appropriate engineering safe guards, trained employees) should motivate employees towards safer work behaviors. I investigated this aspect of leadership with the study populations and found that only a few participants were able recall a vision shared with them by their supervisors. Most of the participants stated that a vision had not been shared with them although a few had described a general statement of no injuries. Examples of the following participants' are illustrative of the situation where no vision has been shared.

> No, I don't think so. He may at the safety meetings that they have at his office, but he's not with us, so I'm not in that environment to know that, so I don't know that. (E-1)
>
> No, the last vision I remember probably was 2008 or something, about hands. No hand injuries for the quarter. No safety vision shared currently. (E-12)

I would say none. (E-14)

The typical this is what our goals as a corporation, minus 2.2 for recordable injuries, that kind of stuff, just the typical whatever is on the billboard at the time. (S-10)

I mean basically, it goes (you know) having zero recordable incidents our motor vehicle incident rate at a certain limit; probably those things stick out most. (S-7)

Not really any, just be safe every day. (S-9)

Some participants, while not stating that their supervisor had shared a vision with them, did provide their views of a vision. For example,

The vision is to work safe, because if we don't work safe then we are going be out of a job. (E-13)

Probably vision of not tearing up any company trucks, I mean that…(you know) because we drive so many miles and really working with our guys not to have the vehicle accidents. So I guess the things he shares with me is trying to get down to zero vehicle accidents. (E-3)

He wants you to go home the same way you came to work in (you know) and no injuries or any of that. (S-5)

The following in vivo codes illustrate the responses from two participants that did inform me that their supervisor had shared a vision with them.

Yes, there has been, they talk about it, of course every bodies' goal is zero injuries, they talk about that. By they, I mean the supervisors and us. (E-10)

He's conveyed an expectation and it is the same as whether he would convey or

> not, whether the goal is whether the goal is 1 or 2. For me personal, the goal is zero. So we are both on the same mindset that 0 can be achieved, if you believe 1 is acceptable then you achieve 1 so to achieve 0 you have to believe zero is possible. (S-11)

From the data provided by the study participants, it appears that discussions related to a safety vision generally were not occurring. Related to the importance of visioning by the leader is the process of setting goals and milestones to help achieve the vision. In the company under study, safety goals are set at a corporation level and cascaded through the organization with appropriate modifications for each level of the organization. Each of the participants was asked whether their supervisor had discussed safety goals with them and the frequency of these discussions. Eight participants (five supervisors and three employees) said that they had never discussed goals. The supervisor participants' leaders seemed to be speaking about goals with them at a lower frequency that the first line supervisors were speaking with their employees.

> None, no interactions. (E-11)
>
> I am not in the shop very often, but we don't discuss the goals. (E-15)
>
> We never did, we never set those goals, naw, I mean it was always assumed we get out there; I guess, I always assumed (you know) the main priority, we're all gonna go home (you know) when this things over with (you know) nobody's gonna get hurt, but we never discussed it. It was never talked about. (E-5)
>
> I don't know, I haven't seen 'em. (S-4)
>
> I don't think we ever have, a specific discussion. I don't think we ever have. (S-

10)

He doesn't really. (S-12)

Examples where participants did discuss safety goals with their supervisor included:

Normally in our monthly safety meetings we will talk about our base did this, our base did not have any lost time injuries, usually in our monthly meetings we will talk about our goals as a whole. (E-10)

Probably, I don't know, maybe once per month. It would be at the safety meetings (twice a month) and possibly a couple more times if he can. (E-13)

I would say at least once per month. We will get an email or a call. Especially when we don't turn in our observations on the job, we definitely get a call. (E-14)

We talk about them usually at the safety meetings every Thursday, we don't talk about those goals every Thursday but every once in awhile they come up, once in awhile they come up. Once in a while he will show the graphs between the everything… deal with the work such as total recordable injury rates, he will bring those spreadsheets, with the tasks showing where we are at. (S-3)

Usually review them, probably weekly. Goals are the safety statistics. (S-11)

Yes, we talk about them constantly, constantly, maybe not, maybe not as in great of detail as I need to, there again, um, sometimes we get to internally focused with other tasks that we have and maybe those other points are not as articulated out as clearer as they need to be, but the big picture of what we need to accomplish is definitely communicated. (S-7)

Conversations about safety visions are not taking place very often; I determined

that conversations about safety goals, while not universal, are occurring more frequently. Communicating about safety was identified as important factor in driving safe behaviors and performance by the study participants and identifying a vision and goals is a form of communication that should aid in motivating employees to achieve a desired state. From the participant responses, this type of communication was not identified as universal in the study population.

Communication by leaders. Communication skill and the level of effort expended on this skill is an aspect of leadership that supervisors identified in their idealized leader (employees to a lesser extent). I determined that the frequency of interactions between employees and supervisors ranged from rare events to everyday occurrences (either face to face or by phone). Additionally, within this category, several tiers of communication efforts were identified ranging from very reactive to very proactive.

Obviously, communication levels were non-existent in those situations where the employee or supervisor participants did not interact with their supervisor (identified as a lack of leadership in the previous section).

> Sometimes other people do it but we most of the time we have a team leader and he does it. No, our supervisor is not in there, when we have this. Well like I say, with this new guy not very often, I've probably talked to him twice since he's been our supervisor. (E-4)
>
> Well my, my supervisor never brings up safety (you know) and my, mainly what my supervisor does, he calls you up on the phone and tells you where to go and

> he, what job you need to be on and the only safety issues they give us is (you know) they send you a little piece of paper you're suppose to fill out if you're able to drive or not. (E-7)

A step up from this level of non-existent communication was reactive communication resulting from a negative incident. In this case, communication is a compliance activity, in other words, because it has to be done and not as a means of encouraging safety motivation.

> I think we do only if there might have been an incident that we heard about and we might talk about that and more details about what happened. (E-1)

Further up the scale to somewhat more active communication is the sharing of information via email. Email is generally used to provide information about incidents that have occurred in other areas around the company. This type of communication can have value if it is used as the basis for discussing ways to improve safety at a location as was described by some participants, but when simply passed along, this type of communication may miss the mark. Employees are inundated with emails and may tend to tune out blanket distributions.

> We always get like any safety incidents that happened, they usually do a report on them especially now that we are [names company], we usually see all divisions' safety incidents come through. It is a global email and I usually don't really discuss them. (S-9)

> He jumped out of the way and he said man, I almost got hit. So we immediately sent out an email to everybody explaining what had happened, we just kind of had

> a review type incident and we just told the hands to stay away from the forklifts and to give themselves plenty of room, just explaining what happened and just told them to be careful in the future. (S-1)

An analogous level of communication to the email distribution is the employee pull on the supervisor to obtain information. In other words, if employees wanted information about safety, they had to initiate the conversation. Many employees indicated they could speak to supervisors about safety if they needed to, but few gave examples of having made this type of effort resulting in little safety communication occurring via this route.

> I wouldn't say that necessarily comes up between the two of us, it maybe something that comes up from our actual HS&E Coordinator they may do that but it's not my supervisor dealing with that type of issue with me. I think it would be more just having a sit down conversation about what went on what the situation was, and why it turned into a unsafe situation and what can be done in the future to prevent this. (E-2)

> No daily conversations, within the last couple of months the office has started calling us every day, but again, it is mostly just for a quick status update, and we send in a morning report as well, but they have started calling us everyday just to see what if there is anything else we need and kinda of just to touch base. The focus is operational, but that would be the opportunity to bring safety things up. (E-11)

More active safety communications occurred when supervisors used safety meetings as

the opportunity to share and discuss safety information and allow employees an opportunity to voice opinions.

> Oh, I mean ya he does, (you know) if, if something, from HS&E comes through he'll tell us about it and then we'll discuss it (you know), I mean that's how we deal with it. (E-6)

Safety meetings where supervisors and employees have the opportunity for open discussion are an effective way for supervisors to communicate their level of commitment to safety, discover the issues that employees are facing and show their care and concern for employees.

> Through talking about things that had happened that month like in our safety meetings, discussing with employees about what we had found in the investigations, what (you know) what caused it things to look out for, just good communications with employee. (E-3)
>
> Oh, I mean ya he does, (you know) if, if something, from HS&E comes through he'll tell us about it and then we'll discuss it (you know), I mean that's how we deal with it. (E-6)

Several supervisors made it clear that they use safety meetings as a mechanism for sharing the safety message.

> Absolutely ever safety meeting we have, I kind of call it the devotional time, come in let's talk about what is going on out there today what you've seen over the last couple of weeks or since the last time we have had the safety meeting and let's talk about it. And that is the way everyone gets communicated to through

word of mouth I mean if you can't have that open discussion during a safety meeting that's you know you are losing out on valuable information that the field guys can give you. (S-4)

He'll more or less he'll sit us down and say hey guys we need to start paying attention for this particular chemical or whatever it has some pretty volatile surfactant or whatever in it. We need to use extreme caution with this chemical because a static charge, any static charge can set it off. Usually we do it in a group thing and sometimes it might separate into an individual thing, we bring something up hey this chemical I notice today it had a lot of gassy fumes coming off of it. Pretty positive interactions. (E-9)

They are constantly sending out safety messages and they talk to us about. Direct supervisor talks all the time about it. A lot of times, it's basically on the spot. When something happens here in the company or in other companies, they will send out emails or call us and say hey watch out for this. That doesn't just go for out in the oil field, that goes for everyday life, I just got an email about motorcycle safety. (E-14)

Because safety meeting are such an important venue for supervisors to discuss safety and portray their level of commitment, employees that are not at the base locations often enough to attend these are missing out on these opportunities. In these situations, supervisors have a decision to do nothing, or make the time to visit the field to hold the safety meetings at the rig sites as one supervisor described (see earlier S-12 in vivo code) or come up with another mechanism for getting their message out.

Finally, the most proactive approaches to safety communication emerging from this study consisted of using informal conversations and interactions as safety coaching and teaching moments. One-on-one coaching was identified as the most active level of communication described by the supervisors.

> I catch them when they come back in, to cover any safety issues that have come up. I can't say that I do it for every job, but I try to attempt to have a post job meeting with every engineer after every job to find out was there any hazards, if the crew is available I try to get the crew, the two operators as well, find out what is going on how did the job go, what can be improved, what did not go right what's broke what's up, just a general safety, not so much safety, but a job finalization meeting to make sure everything was handled. (S-4)
>
> I tell the guys here all the time (you know) I know we're busy but that doesn't mean you have to rush it takes as long as it takes, and whenever you're done that's when ever they're gonna get their equipment (you know) and nine times out of ten we will beat the time that they need the equipment (you know). I try and make everyone understand that you don't have to rush and get nervous just calm down we're gonna do what we gotta do (you know) if we have to get extra people we do it. Yes all of that, it could be one on one because if I'm in the back and I see something I'll stop whoever it is right there and (you know)not just to say hey you can't do (you know). It's just a conversation that basically it's almost to where they're telling me why it's a habit, so its again not being just talked to and told hey don't do that, lets understand why you can't (you know) do that. Just to

keep it fresh just to keep it in their minds (you know) that that it does get forgotten (you know) and I keep going back to the same thing but it's just (you know) with the repetition of what's going on just to occasionally just put it in someone's head, hey (you know) pay attention this could happen, as long as it stays in someone's head (you know) they're thinking about it they have a better opportunity to staying safe. (S-7)

I think it would be more just having a sit down conversation about what went on what the situation was, and why it turned into an unsafe situation and what can be done in the future to prevent this. (E-2)

I'll actually go back there and show'em sometimes, because its, sometimes, you can give people stuff to read or you can read it to 'em and they won't understand and if I see one of the guys potentially doing something that could hurt them or someone else (you know) I'll go in there and I'll stop 'em, I'll shut 'em down, try to explain it and actually sometimes I'll even show 'em. (S-6)

Regardless of the type of information employees receive from supervisors, they realized that they needed safety information in order to keep themselves safe. If they could not get this detail from their supervisors due to either lack of leadership or lack of opportunity to participate in safety meetings at the base, they turned to their co-workers at the rig sites to get this information either through safety meetings or through conversations.

Well I speak to other employees about safety because when we are on the job site I am responsible for their safety. (E-12)

> Well, (you know) like our, our, most of the guys I work with (you know) like a same thing if they're on the job and we're on a job and we see something , well he'll see something he'll call me; well hey we're out here today and this (you know) look this happened, or that happened or (you know) like really; so the next time I go I may look out for the same thing (you know) that's how we've, we relay it. (E-6)

> For one thing I am new to this field and I don't want to do anything dumb and end up getting myself hurt. Getting information for yourself to keep safe and so that I know how things work so I can tell other people. (E-14)

Supervisor participants acknowledged the importance of communications when they described their idealized leader as one with good communication skill especially around safety. However, several supervisors acknowledge that the level of effort could be improved and illustrated by the following comments:

> I think the communication is good but it can be improved. I know they do an IRB [incident review boards], oftentimes, whatever is discussed in whatever and I realized it is somewhat private. It would be good to communicate to other district managers that are not involved in the IRBs to sit in and listen. Oh we possibly have this hazard here. I think the communication could definitely improve. (S-11)

> Sends them safety related information by email, whenever I get stuff from HS&E I get stuff out, but I am not 100% about that. I need to get better. (S-2)

It appears that employees and supervisors know safety communication is an important

driver of safety performance; however, the level of effort needed to sustain appropriate communications was not universally derived from the data.

With these positions stated, I was not surprised to learn how employees felt about communications from their supervisors versus senior leaders. This question was asked of all the employee participants to help get a sense of the importance of the local supervisor's message. Senior leaders at the company send out safety messages frequently, but are these messages effective with the working employee? The responses to this question included seven of 15 participants stating that it would influence them less generally citing that the senior leader did not have an idea of what they actually go through whereas their supervisor does. Example statements included:

> I think honestly I would say less. Well I think I'm not sure that those people that person has been in our shoes, been out in the field, maybe he has I don't know, but I think it is more of a numbers reason maybe not as much of a personal reason as it is if it came from my boss. (E-1)
>
> Less, yea, I mean, the people at that level I think are so far removed from us that I don't know that their message, I honestly I tend to skim the emails that are coming from people at that level. Whereas if it is something coming from my direct supervisor than I read it a lot more carefully. Because I feel it has more direct effect on me. (E-11)
>
> If I get something from them guys on my email, I don't even look at it because it is BS that is how I look at it. Or it might not apply to us in the [states location], it might apply to offshore and I don't even look at it. (E-15)

The participants that believed the effect would be the same generally focused on the importance of the message versus the messenger. These might be the employees higher on the conscientious range of personality traits.

> I would say to me, the safety message from him, would be, I wouldn't weight it any different, between him and my supervisor. Not that I don't respect, but it is a safety message and it would not matter if it were the president of the company or someone that had been working for the company for 2 days. (E-13)
>
> I think they, they'd probably be the same to me just because I think it would be a fairly similar message that'd be coming from both of them, I wouldn't see it being too much different that I would take one over the other one. (E-2)

Three of the 7 employees that felt the message was the important vehicle were also those the identified self-motivation as the reason they worked safely. Only one participant stated the senior leader would influence him more and he was speaking to a hierarchical reporting level, specifically,

> Well, I would say more. Well, cause basically he is the law, you know, that is what it is. Absolutely, that all snowballs downhill. (E-12)

A final element in the communication realm that emerged from the data was the concept of mixed messages. It was clear the employees could see through half-hearted admonishments for safety from their supervisors; in other words, it was difficult to convince them that safety was important when the messages or the actions were different. The following in vivo codes illustrate the situation and the frustrations that employees faced.

> I believe he does. But, I don't know, well …I think that he talks that they are preventable, but he never backs up the talks, just go get the job done. (E-10)
>
> And then they give you this, uh uh in my … what's it called? am I fit to drive, and but yet they'll call you up in the middle of the dang night want you to go out on a job and knowing that you, that you just went to bed and had about four hours of sleep but this customer's gotta have it, but we want you to go ahead and go but we want you to fill it this 'am I fit to drive' and you're not fit to drive but they yet they want you to fill it out and lie on it, why send it. (E-7)
>
> Also have a checklist that we are suppose to ask, we have the list and I have it somewhere, I am now, it is what we are suppose to do and I have not done, We are suppose to ask them have you had anything to drink any drugs that might make you drowsy, and we have 10 questions that we are suppose to ask. That would be something that we should be doing, and now that you have reminded, we are suppose to do, you have reminded me to do it. I forgot about it. (S-1)

One supervisor participant experienced a revelation about mixed messages during the interview process; his comments explain the insight very well:

> Well to be perfectly honest and you may approach this and I don't mean to get out of order for what you're doing here. But one of the things that has come to a big realization in our short conversation here, is that I'm not making enough time for safety, and it's speaks volumes it's not on my calendar to go out to the field to do a couple of these safety deals with some of these field supervisors just to show'em what I'm talking about, (you know) and all it's a, man it's a madhouse in

> operations. But that, if I'm serious about it I've gotta make that a priority and that's exactly what our company preaches it is a priority so if we say it is make…okay, I'm through with that, I'm sorry. (S-8)

Communication was recognized as important by employee participants as a means of building relationships, which ultimately identified the leader as caring about the employee's well being. Supervisors identified good communication especially in terms of safety as a means of showing the level of commitment to promoting safety. A broad range of communication types was identified starting with nonexistent and running to one- on-one coaching and mentoring sessions. Clearly, some of the communication efforts were hitting the mark in motivating safety while others were not.

Visibility. The importance of the aspect of leader visibility emerged in this study in terms of leadership trait of leading by example and participating. It also emerged in the data related to worksite visits, which are a prime vehicle for leader visibility. Both employee and supervisor participants thought these were important activities for leaders, and there was good agreement that these visits were not occurring as often as they should. A more thorough representation of the results was provided in a previous section.

Workplace safety model. Leadership was found to have both direct and indirect influences on safety behavior in the Christian et al. (2009) workplace safety model. I covered various direct influences in previous sections of this chapter and the remainder of chapter 4 is focused on the aspects of the workplace safety model where leadership has indirect effects. As described by Christian et al., distal situation factors in addition to leadership can influence safety. Some of these factors emerged from the data of the

current study. For example, workload pressures have been shown to affect the amount of time employees were able to do their jobs safely and severe workload pressures were shown to encourage employees to take short cuts (i.e., skip safety steps; e.g., Antonsen, 2009a; Choudhry & Fang, 2008). In this study, participants that had worked outside of the U.S. land operations in previous jobs identified a difference in workload pressure between the U.S. and other regions. Specifically describing rig site staffing levels as higher offshore and overseas than on U.S. land rigs. This situation increased the workload on U.S. land employees in two ways, first it made them work very long shifts, and several participants mentioned that 24-36 hour shifts constituted 90% of their jobs. Employees were fatigued and having to handle complex activities. Their situational awareness (Sneddon et al., 2006) may be impaired rendering them less able to deal with non-routine problems.

> I have seen it on jobs pulling units and things for the oil companies to where they want to get that job finished in that day, and I've seen, I've actually seen them pulling wells with car lights, which is very unsafe. But as far as myself I've never been asked to do something unsafe, we have, within the oil company I worked at they liked to stop and of course we do too. (E-1)
>
> Hurrying to a location trying to meet a certain deadline to meet a mud check. Driving and driving tired, ether trying to get from one location to another because they are having trouble and trying to push yourself going back from one location to another. We did not handle it well. Concerned about working unsafely. Yes, I felt driving was a hazard, I was sleepy and nodding off. At one point just pulled

of the side of the road and got some sleep. (S-12)

I think everybody's workload is quite high and things get chopped up. The workload has always been high, not just now. (S-2)

I thought, I think we need to focus on getting additional people in here, getting experienced people in here, and so we can spread the work load out, because right now the work load is tremendous, and I really feel like that's a key factor. Cuz just like I said just a couple of weeks ago I spent 24 and 12 is what 36 hours up here, and at the end of that next day I was tired and I still had to drive home, now it's not an issue for me, I guess I'm use to it I don't know, but for a lot of these younger guys, and these guys, and my work wasn't all physical also, but these guys in the shop where their work is physical, its hot, its grueling, we're working in shops with fans blowing hot air, these guys are tired they're worn out, so I think that's a key issue. (S-6)

The second effect of the differential staffing levels is the pressure for employees to help-out on the rig doing jobs outside of their normal scope. A participant made the comment about the service company hand just hanging around while the rig crew was working double duty. This condition forces employees to do work without proper training and increases the risk of injuries from the lack of knowledge. doing work without the proper training is against company procedure, but the peer pressure to participate is enormous and should not be discounted.

Fewer people will get the job done. Offshore you have hands, crew hands, and roust-bouts that do everything different, they got some specific tasks you tell them

> you mix this and you don't have to do it. But, on land, a lot of times the rig hands will be tied up and you will have to do it yourself. Do some of the mixing and stuff yourself. (S-12)

However, there were opposite comments where the staffing levels were adequate and could include relief for the employees and rig crews. Five participants let me know that they have never been pressured by clients to do something that was unsafe. There were comments about clients pushing for good safety and those that pushed production over safety. To help understand this contrast, I asked the participants whether they experienced a push for production over safety with small clients only or if large clients also pushed production. The responses tended to be dependent upon the types of clients the participants worked for and no clear pattern resulted.

> Most of the customers that I work for, that I have to go through little safe, site-specific safety orientations when I first started. All praise safety very highly and I mean set a good general atmosphere that I wouldn't have to be put in that type of position. (E-2)

> Safety before production. Pretty clear and consistent and I think the employees here have realized and the culture has definitely changed over the last 2-3 years and they realized the direct correlation between be safe being a good business practice. You are not going to be profitable as a business if you do not have a good safety record. I think there is a little bit better communication; we went from a reactive to a proactive culture. (S-11)

> My managers are not making me really, do this, well they are, the customers are

> more demanding it or we will lose work. (S-2)
>
> Hurrying to a location trying to meet a certain deadline to meet a mud check. Driving and driving tired, ether trying to get from one location to another because they are having trouble and trying to push yourself going back from one location to another. We did not handle it well. Concerned about working unsafely. Yes, I felt driving was a hazard, I was sleepy and nodding off. At one point just pulled of the side of the road and got some sleep. (S-12)

Comments from the supervisors seemed to indicate a sense of resignation in that they could not influence the client from pushing production nor in making the safety requirements more standardized; although, there were examples of clients agreeing to add a person to the site for relief when the job was running longer than planned. Another supervisor discussed the attempt to keep employees from driving during the night to get reports for clients by 5:30 am. He identified a competitor loosing the business when they pushed back and the companies that did get the business got the message.

> On, up here on the south end, we work for [names company]. They require an early morning mud check. They want the report on the company man's desk at 5 am. And we have one hand on three jobs which is pretty normal and he had to leave out at 10 at night to have the third report on the desk at 5:30. If I could do anything different with that, I would make them daylight checks. So we could do everything in the daylight. I think that would greatly reduce the chance of having vehicle accidents or incidents with an animal. We have a lot of deer strikes, or hitting a hogs and stuff like that. That's the majority of our accidents is

> something like that. (S-12)
>
> We are looking at a 20 million dollar customer for our area so it kinda….we feel pressure to keep doing, which it depends on how you look at...people work graveyard shift all the time. And if that is your normal shift, graveyard shift, anything you are required to do that during the day and that would fall under journey management where it would be out of the ordinary, a risk by doing something during the day. There would be more risk at night, but that's your scheduled work hours. They got a policy they don't want you driving between 11 at night and 5 in the morning. But if that is your normal work hours that's your normal ours. So if you work at night you don't need to be driving be 11 in the morning and 5 in the afternoon because your are tired. (S-12)

Work place pressures appeared to have an influence over the safe behavior of the employees. However, the impact was not seen consistently from all of the participants and there are likely intervening factors such the type of work, the importance of the client to the local supervisors, the safety priority level of the client, and others that influence this aspect of the workplace safety model.

Job risk and job attitude. The relative risk of a job influences the potential for injuries and the attitude towards the risk influences the employee's reaction to it. One means of assessing job risk is through the awareness and identification of hazards associated with the job. When I asked participants how they could be injured on the job, everyone was able to describe hazards. Generally, the comments addressed physical hazards such as caught between moving equipment, chemical exposure, driving,

electrical shock, environmental concerns, falling objects, fatigue, grinders, high pressure systems, lifting operations, radiation, and slips, trips and falls. There were two categories outside of physical hazards, which included the experience level of other people and a lack of familiarity (i.e., situational awareness) of the work location. The following codes are illustrative of the responses from participants:

> There's definitely a risk whenever I go to take an oil sample or water sample from a line that has natural gas running through it depending on what kind of pressure out there and also grabbing oil samples, or water samples, gas samples off of tank batteries and you have to open up the hatch and you have the risk if you have high levels of H2S gas in there that that could pose a problem as well. (E-2)
>
> Probably the largest risk of any kind of serious injury would be when I am actually on the rig floor picking up or laying down a bottom hole assembly. It is being lifted with cranes, forklifts, air hoists, so the hazard would be of it getting dropped. Occasionally we end up being close to the action especially if they are understaffed, we end up being involved in more than we should be. (E-11)
>
> A lot, I'd say over 98% of the time you have to close in the well and there is enormous valves, there is a time when there are alcohol lines running from the well, and you have to close the well so that we can attach our equipment, put our lubricator into the wells, when you depressurize the well there is a chance of release and also alcohol exposure, (casts on top of the well) pinch points at the top of the well (E-13)
>
> Of course the driving hazards because we are driving a lot of miles. (E-9)

> Dangers are in the inexperienced people, people that are new to the industry especially here we have a work boom and they will put a lot of inexperienced people on rigs in the control of things they should not be in control of and to me that is the most dangerous part. They don't have the experience to run the equipment. (E-10)

> For me personally my biggest risk is pulling up on some body's location that (you know) that maybe we haven't worked for before or something (you know) that makes me a little more leery. (E-6)

Interestingly while the participants were able to identify many if not most of the key hazards they face, company records consistently indicate a failure to identify hazards and assess risk are the most frequent causes of accidents identified in investigations.

Since it was clear from the data that the participants could describe the hazards they faced, the follow-on analysis probed how they obtained this knowledge. In this study, employee participants identified four main ways they learned about hazards: training programs (most frequently), through peers, on the job training (OJT) and through safety meetings. About half of the employee participants indicated supervisors provided a means to learn about hazards, mostly through safety meetings, but also through other interactions. Learning about hazards provided a measure of job risk understanding, but also added to the safety knowledge of the employee, which is another important aspect of the workplace safety model.

> Through, training through our failure meetings, through the customer's meetings and also our safety meetings. (E-1)

> A lot of the hazards within this job are gone over when we go through orientation. A lot of it is hands-on that I have learned and people can talk about explosive and perforating guns, but you are not going to understand it unless you see it. On the job training is important. It is quite overwhelming to talk about the hazards before you actually see it and then say oh that's not that bad. Through training of course. (E-10)
>
> It's been 95% on the job training, whether it be through safety meetings. Honestly, rig site safety meetings over the years have probably been the primary way that I have learned about the hazards, things to watch out for. Because I have, never having actually worked as a hand on the rig, since we are a support role, those of us that came up solely on that side, there is a lot that we just never learned and if it wasn't for safety meetings and actually hearing the rig crews talk about what has happened on other rigs and stuff for example. (E-11)
>
> I don't talk to my supervisor about hazards. (E-12)
>
> He does, especially if we go to do some different work for...for the majority of our clients we work with all the time, you are in and you are out. But, if we go to a different, well from a different client, then he will explain to us because the clients will talk to him and he will want to know the different hazards, where do we need to rig up of the job, where to put up barriers. (E-13)

Supervisors identified similar mechanisms, but relied on OJT as the mechanism for employee safety training more heavily than employees. They recognized the role of training, safety meetings, and peer sensemaking, but to a much lesser degree than the

employees. They also seemed to express less ownership in the process often describing a role for a mentor, but not for themselves in helping employees learn about hazards. From a contrary view, several supervisors did state that their mechanism was to lead by example (i.e., wearing PPE) and others recognized the usefulness of safety meetings as a means to conduct training.

> The same thing [OJT] but we also, now we have not pushed it for awhile, but they started a mentor system, so when you went out on a job, the most experienced hand would...if we had an MWD hand, came out there who had not have been on a rig or if this was his first or second, before we assign him to the directional hand and we told the directional hand that they were in charge or they were the mentor and your job is to make sure that he does not do anything stupid. That is basically what we told him, but he understood that he was in charge of safety out there. The directional hand is in charge or you are the mentor of safety out there. If he saw an MWD hand walking aimlessly fixing to run into something or get hit with something. It was his job to stop, we tried to make sure that everybody is aware that it is their job, told him it was their job to mentor the newer guys on the job. (S-1)

> The [names training system] modules of course, the LO/TO [Lock-Out/Tag-Out], individual meetings, safety meetings that we have and just anything that is sent out safety wise, from HSE, or from [names company] or other companies have something they share and we make sure we put it on the safety board and we discuss it during safety meetings. (S-2)

Well there are several ways, the most common that they pick up information from is obviously on the job training, but I feel like they catch a lot of things they did not think about during safety meetings. Whether it be on location or here at the shop where I am leading safety meetings I try to cover every safety meeting at least one [names company incident management system] that where someone was injured, almost injured or seriously injured. That way they can see okay well this was a problem but we deal with this every day how can we minimize or negate any potential hazards there, safety meetings to me is something we can't do enough of, I'm the first one to tell you that I don't have as many as I feel like I need, I just don't have the time and I don't have the people here to have them, but being out in the field and actually seeing what goes on before you have to do it, as a potential, young operator or engineer, is the best way to set back and say wow that could have hurt somebody, or wow that's probably the best way that we could probably do that even though it is still slightly risky and if that is the case then let's talk about there could be a better way of doing it. (S-4)

Most of it…part of it is through experience and witnessing other things that have happened and part of it is the more experienced people that were mentoring me as I was being developed. Having access to someone that has more experience and more knowledge of the dangers is one of the most important things. The main approach I take, all the new employees I team up with a mentor or try to depending on whether we have the available personnel, try to team them up with one of our senior hands, one of senior employees before they break out, before we

> allow them to run a job by themselves, the senior personnel will sit down and talk with them and make sure we all feel comfortable they can go out and run the job not only successfully for [names company] but also safely. (S-10)
>
> Usually when we are going on location as they are training like before they go to mud school, they will have a pre-ride and they are out there you show them exactly what we do and how we do it count the inventory and familiarize them with the rig. That's the biggest problem, a lot of time we are getting college kids that never had a job in their life and jumping out there in the middle of the oil field and there is so many…and around every corner and every step there is a chance of getting hurt. And trying to teach them about things that can hurt them. And any time there is a hose lying there it could have pressure on it or a cable if there are pulling on something, just to stay out of the line of fire. Training them directly. Things to watch out for and then the training modules are real good too and you train them and talk to them and then show them that and then they take the modules and then they say yea I remember seeing that and they kinda know what to look for. They do a little bit with the chemicals (in mud schools) they make them wear safety glasses, use pipette bulbs, smocks, and gloves and everything while they are in the lab, but basically that is the extent of it, because the main thing is learning the chemical parts of it and properties, products and all that so there is not a whole lot of safety. (S-12)

Participants provided a number of avenues for how they kept from getting hurt. In no particular order they included getting assistance from other employees, having a safety

attitude instilled in them, their existing experience, a fear of losing their jobs, plain old luck, following existing safety procedures, wearing proper PPE, attending safety training and meetings to get the information needed to protect from hazards, and being aware of the situation.

Based upon the responses from the employee participants, I identified a good knowledge of job risk and a healthy appreciation for the risks employees faced on the job. There are broad ranges of opportunity for the individuals to learn about the hazards, many of them informal. From the data, supervisors did not universally appear to participate in helping their employees learn about the hazards and relied on employees learning about hazards through their on-the-job experience. However, the bottom line for all the mechanisms described is that they have to be effective at keeping employees out of harms' way. The local leader has the ability to influence the amount of time spent learning about hazards and providing employees the mechanisms to obtain this knowledge.

Safety attitude and commitment to safety. These two themes are related because leaders influence the safety attitude of their employees through their own attitude and their visible commitment to safety. In probing the issue of safety attitude and commitment to safety, I noted a recurring theme from both employee and supervisor participants about the *company* drive for safety. Participants described various messages about safety sent down from the company or the HS&E representatives (seen as proxy for the company) detailing the importance of safety. This reflection of the company stance is

less personal and perhaps lets supervisors off the hook for exhibiting their own high personal commitment to safety.

> Well it's also our priority to the company I mean we have to keep our TRIRs down… our vehicles, it's a constant reminder that they have to pass all their safety inspections to keep our trucks on the road. (E-1)
>
> I think it does, it is not something that is talked about that much, but we get emails, reminding us of safety issues on a pretty regular basis. One of the most dangerous things we do is drive, we spend a lot of hours on the road going to and from jobs and that is something they focus on a lot. And they enforce the journey management and remind us of that kind of thing pretty often. The emails that are specifically addressing a safety topics they come from the HSE guy in [names city], but there have been reminders from coordinators, especially when it comes to the journey management. In fact, every time they send us a packet of job information for our next job, they always include a copy of the spreadsheet for the journey management and there is always a reminder to make sure we do that and send it in. That's coming from the coordinators. (E-11)
>
> Safety First card, I think that was important, not that we engrain it in them every day. I think to me that was one of the most important thing that [names company] did is that …they gave us the card and said you know what is safe and what is not safe and we will back you no matter what. To me in a nutshell that is what made the biggest difference as far as [names company] is concerned. (S-1)
>
> Beyond the references to the company's position and as a reflection of the

participants' safety attitude, I was given various examples of safety holding a priority, most often related to avoiding personal harm.

> It holds a priority in our workgroup because if you get hurt, you could permanently get hurt and not work the rest of your life, you're not only hurting you and your family, but everyone involved. Everyone likes to work safe, it's not to me, I can't put a price tag...okay let me say this, from where I sitting and from where I work in this company, there is not one piece of iron that is worth getting hurt over that can be replace. I have seen injuries in this company where people have lost the ends of their fingers or crushed their arms, that can't be replaced. If you had to ask me one question about all this, there is not one piece of iron in this company that is worth getting hurt over. That can be replaced, not to say I don't respect it, but you can't replace yourself. (E-13)

> Safety does hold a priority in our workgroup because nobody wants to see anybody get hurt. I know that it is stressed down from the company, that I think they are more concerned about us than any repercussion that might come from above. My bosses don't want to see me get hurt. Nobody wants to see you get hurt. That all goes back to your first-line leaders, if they don't care, then, it's not going to matter what happens. (E-14)

Contrary to simply espousing the company line, a number of supervisors did provide their own personal views on the importance of safety and specifically how they distilled this information to their employees. For example,

> I think you have, we used to hold safety meetings once a month here, and then we

> decided in January or February, you know what, this is not working because if you only talk about it only once a month, it does really not come across to the guys like it is a priority that is why we try to go once per week now, every Thursday, and I think that has made a significant difference and we do the morning meeting now where we always open with a safety moment. Just by always putting, we never use the in your face approach, it's like we don't turn left rig up and I am going to listen it this way the in your face approach. (S-3)
>
> Actually, it is a culture that is driven from management down if you whole-heartedly believe in safety and you push the safety culture then your employees learn that this is the way of life. And if you can get that going out to the field guys and gals they start realizing, you know [names employee] is always on me for my safety glasses, and then it makes you proud of the manager when you are walking by and you see somebody with no safety glasses on doing something they are suppose to be; and you got two guys that are walking towards them right then and they both sit there and tell him he needs to get his safety glasses on, that's when you realize you've got a good culture. (S-4)
>
> I think sometimes as a company we are too, when things are good, we do definitely focus, how do I put this, when things are good, or when things are bad we do focus on safety, but sometimes during the transition we do have a tendency to put safety as secondary to the financial performance of the company. (S-10)

I identified a range of safety attitudes reflected in the study group; those that did not have a supervisor that shared a message regarding the priority of safety were less

convinced that it was a priority. A few examples of safety not being priority are provided below.

> Ya, ya I'd like to hear more of what goes on, and then I could, I'm sure I could give you a better answer, I don't hear of any really safety things, every once in awhile but nothing on a regular basis. I'm sure it happens I just don't ever hear about it. (E-6)
>
> I think there's a lot of people in general that don't value their safety as much as I value mine. (E-8)

In some cases, even though the supervisor held a priority for safety, their manager may not have. This point is illustrated by the following in vivo codes.

> I don't think he sets a priority, I mean, it's just a common knowledge that we are going to work safe and we are not going to do anything that is unsafe. But he does sit there and from day one say from day one have you worked safe today, or this month or this year. It has not been done. But I know he is not going to want anyone to work unsafe. (S-1)
>
> Safety, second**,** get it done first. (S-4)

When I investigated the safety priority versus production priority issue from an indirect approach (e.g., probing drivers of unsafe behaviors), the mixed messages theme arose. Specifically, supervisors may be reflecting inconsistent behaviors to employees, in other words, they are saying the right things, but then supporting incorrect activities (e.g., driving when fatigued). When I analyzed the participants reasons' for working unsafely, several categories emerged, for example, the lack of hazard recognition, poor evaluation

of risks (training issues), and the lack of situational awareness (personal issue). However, the largest category to emerge was the failure on the part of leaders to keep the employees from working unsafely mostly through the issue of mixed messages or the expectation that employees would already know what to do. For example, implementing a policy that bans night driving, using an "am I fit to drive" checklist, but then asking the employee to drive to a client's site in the middle of the night is an example of the type of mixed message delivered by a supervisor. Several employees provided comments related to this:

> And then they give you this, uh uh in my … what's it called? 'am I fit to drive', and but yet they'll call you up in the middle of the dang night want you to go out on a job and knowing that you, that you just went to bed and had about four hours of sleep, but this customer's gotta have it. But we want you to go ahead and go, but we want you to fill out this 'am I fit to drive' and you're not fit to drive but they, yet they want you to fill it out and lie on it, why send it. (E-7)
>
> How it usually comes about, and it doesn't really happen anymore because we no longer work for that operator than, they're closed down for the rest of the year. When we'd be on location (you know) we'd need to move our equipment off of our trucks or …um and there was nobody available or nobody was willing to help us so in order to rig up we would use the forklift. (E-8)
>
> Like I told you about the whole lack of sleep thing, I have had management, you know even though they know we been on a job will do back to back jobs, have you go from job to job to the next because they do not want to turn down jobs.

> No recuperation between jobs even when have just finished a 30 straight job. (E-12)
>
> Well I've mentioned it, um but they're usually like 'oh you know, we always do it' and I just kind of brush it off; as a common practice. (E-8)

Also related to driving, a supervisor made a point of how he would not allow his employees to drive when conditions were unsafe; instead, they would hire a third party delivery service instead. The point of the hazard and the need to avoid it did not fully connect, as he was willing to put an employee from another company at risk.

In further analyzing the safety attitudes and commitments responses, I found that in the face of mixed messages from supervisors, employee participants turned to peer sensemaking to determine how to stay safe. The following in vivo codes illustrate this point.

> I believe we work with normally small teams and everyone kinda watches out for each other. We get into a good friendship with the people and just work together everyone knows how each other works and usually we will say something to each other hey watch this, just communication for the most part. (E-10)
>
> We do work in a team, we watch out for each other; usually the rig crews and the people we work with on location are good about watching out for other people also. (E-8)

By necessity, employees turned to colleagues to fill the gaps created by supervisors providing either no message or a mixed message.

Even when safety was a priority, there was still a difference of perspective between the employee participants and supervisor participants in terms of the how employees could work safely. While employees believed that they were conscientious, using their peers and their experience as well as training to stay safe, supervisors indicated that common sense was a means of keeping employees safe. For employees conscientiousness was related to having the time to work safely and they referenced their reliance on other employees for information and assistance in working safely.

> When we are on the rig floor typically, we are the ones running the show when we are picking up the tools because that allows us to take the time we need and do the best we can to do the job safely. So for the most part, I am able to do the job safely. (E-7)
>
> Necessary steps to kind of limit my risk and to make it a little safer, and just paying attention to my surroundings, making sure there is no poisonous snakes around, or any other I guess hazards, like the heat or anything that would put me in position. (E-2)
>
> I'm pretty conscientious about what I'm doing and I'm pretty cautious. (E-4)
>
> I think the biggest problem in the oil field is hazard recognition. Some people don't just take the time to look and go exactly what am I getting into here and make sure if makes sense. Some people just don't think or don't have common sense or whatever. But that is how you find most of the hazards. (S-3)
>
> I think it was common sense. (S-2)
>
> It is due to just their common sense. (S-9)

There may be a danger in supervisors assuming employees will use common sense as their means of avoiding injury, especially if there has not been proper knowledge transfer to allow employees to understand the hazards. This belief in common sense and the lack of field visits by supervisors to understand the employees' situations may hint at the lack of safety commitment and further underscore the likelihood of improper sensegiving by the supervisors. There was also discussion about experience as a driver for employees to work safely and as frequent means of obtaining training. On the job, experience could imply learning through mistakes, which means injuries as worst or near misses at best case.

Proximal person related factors – safety knowledge and motivation. In order for employees to engage in safe behavior, they need to be knowledgeable of the hazards, the means to protect themselves from the risks, and they have to be motivated to act accordingly. Knowledge of hazards was covered in a previous section (Job Risk); however, to recap, this knowledge was gained through training, peer sensemaking, and safety meetings. Training is a common means of providing knowledge to employees regarding not only hazard recognition, but as a means of keeping themselves safe through appropriate activities and behaviors. Supervisors influence not only the amount of time employees spend in training, but also their opinion of the usefulness of this training. I found that employee and supervisor participants generally supported and acknowledged training as a well-known company requirement. Employee participants identified supervisors as checking on the completion of training, but only a few commented on the

importance of training in keeping employees safe or as a means of recognizing hazards. Rather, the theme was more of meeting client or legal requirements.

> Well we have required training, like chemical safety, like that every other year, but as far as…checking…I don't think so, but I take it so I don't know if he does or not on people that haven't fulfilled their obligations, or requirements… I'm sure he does. (E-1)
>
> Yes, they check on the [names training system] and that sort of stuff, make sure we are getting those done. He is usually there during the safety meeting so he gives his 10-15 minutes of information that we need about working safely. He gives us scenarios and examples. (E-10)
>
> That's started out from day one, the first thing I did was 42 PowerPoint slides and then I had to go and get my passport, it is called a passport program that you go to college and get to be able to go onto certain oil fields in [names state]. And it is just ongoing from there, I don't think I have stopped doing, safety modules since I started. (E-14)
>
> They will just tell us hey boys we've got to get this stuff done, so we just do it. (E-15)
>
> Right, sure it's mainly, I mean like one of just start short topics or key points was to remind everybody that their [names training system], (you know) were starting to see that average drop down and that people need to make sure they keep their [names training system] stuff up to date. So it was just kind of okay guys we're past half way in the year, we know we all have to this all this complete by the end

of the year. Start paying attention to your [names training system] so in the last week of December you're not cramming in your [names training system] stuff. (E-3)

It is mandatory for us because we work with so many customers so not only do we have our own internal safety training, but each customer can mandate their own safety training that they need us to attend to enable us to work for them. So quite frankly I never really put it as an option you know, if [names client] says you have to complete this, this and this to work for us, I just tell the guys Shell wants us to do this, this, and this and then so we can keep working for them...I don't really go back and forth with it, it's just what we got to do. (S-3)

I usually bring it up to them at least once a month and when people are falling behind I am not opposed to sending them emails or calling them and generally just nagging them, to make sure they take them, they are aware that I know what is going on. (S-10)

It is a constant talk, we are always talking about it. We are on a leased base, we say this has got to be done by the end of the year. We have to look on line to see if anything is needed…they get tired of doing this. They need to be more committed, they are not as committed as the managers and supervisors. (S-2)

We do a winter driving school once every two to three years, that is the only other safety deal. We do [name training program], like I just had a company come in and do an [names training program] class. So we do any of the certifications. [names training system] is a joke though, when I can sit down and I can go

through it in a matter of 30 seconds and answer all the questions and I pass and all I am doing is just clicking next and take the test, it is a joke. (S-9)

I did not find a theme that connected the value of safety training or knowledge as an important mechanism for enabling employees to work safely. Rather, the theme that safety knowledge, as an important activity, existed because the company and clients expected it; an apparent disconnect between the underlying importance of the process.

Safety motivation has also been covered in detail in other results sections, namely in the leadership traits that motivate safe behavior. An employee that has all the knowledge necessary to work safely may still be injured if he or she is not motivated to work safely or is motivated to take shorts and skip important safety steps. In order to increase the level of safety motivation, employee and supervisor participants identified external motivation in the form of a caring and involved manager/supervisor when describing the type of leader that would motivate them and others to work safely. Someone that communicates the importance of safety and relates the concern they have for the employees through an extended interest in the employee and their families. Further, a leader that reinforced safe behavior with positive feedback (i.e., celebrating successes) versus encouraging risk taking (i.e., emphasizing production) was seen as motivating safety. A few participants also reflected on an internal motivation to work safely as indentified in previous in vivo codes.

Safety compliance and participation. The most directly influential aspects on safety outcomes in the Christian et al. (2009) meta-analysis of safety research were compliance to rules and procedures and voluntary participation in safety behaviors and

actions. Participation was described as conducting additional activities such as initiating safety related change and going beyond the activities that are required to help improve working conditions. In this study, safety compliance as a known requirement emerged from the data in a number of ways. First, participants referenced specific policies and procedures to follow and generally agreed that supervisors enforced compliance. Programs such as having and wearing proper PPE were referenced and the availability of PPE was near universal for the participants.

> I believe I have everything that I need and if I need it, I will get it. I can't think of anything right off hand, that I need that I don't have and I don't have a problem getting. (E-13)
>
> I have everything that I need. Sure (would feel comfortable) and if they don't have it there at the shop, they just tell you to go out and put it on your card. (E-14)
>
> I'm pretty sure we've got about everything; glasses, shoes, gloves you name it we got it. (E-4)

The few exceptions to this position were related to capital items (e.g., tools) that were required to do work more safely.

> Well our hoist back here, I've brought it up several times, (you know) we need, we need a better system, now they've improved since but that would be one, the hoist, it's old, it's not got near enough lift capacity. It needs to be taken out and redone, but that costs a lot of money…oh ya, he was open to hearing and (you know) we know what the solution is – get rid of this one and get a good one in

here, but I think it's out of his hands too, because the cost involved. (S-6)

Stop work authority, which is the responsibility of every employee to stop work when the safety of the task is in question, was another policy referenced numerous times. These responses were surprising to me as no particular questions were related to the program; but it appears to be well known as a mechanism for keeping employees safe. Participants commented that this program was consistent through the industry in that most rigs and clients had a Stop Work program in effect.

> Yes, I shut down me and my crew, I said that we would not be doing any more jobs because me and my guys were out of hours for driving. The biggest thing was he wanted copies of the logbooks. (E-12)
>
> [Names company] seemed well about it (you know) like I say always my supervisor, always backed me up, if I ever had any type of issue I always felt (you know) I could stop, I never did have to stop work, but I always felt that I could, or if I didn't go to work, we only had the one time where we had ice, and it was like ya, get there when you get there. (E-5)
>
> Because they have the Stop Work program. They are…have been instructed that they are the ones that have to make the decision in the field. If they call me about a safety related issue I am not going to give them the answer, they're gonna give me the details and what answer they think should happen and then I am going to support their decision because they have to see, they see that because...because I can't, and if they can't send me photos or pictures of what is going on I can't make a decision on it and I don't want to take the decision away from the

> engineers in the field who are the actually supervisors while they out there. I want to support them in the decisions of which they made as long as they're not gonna hurt, mane, or kill somebody. (S-4)

Incident and near miss reporting are also required activities and participants understood the requirements of these efforts as well. I found employees and supervisors expressing a range of experiences when it came to reporting incidents, from negative, to neutral, or productive. Largely the type of experience came down to how the supervisory level above the reporting individual handled the situation, but the knowledge of the requirement was consistent.

> Well we had a shaft-straightening device, a guy got his finger cut off with it, and that was something to discuss of how we could fix that thing to where that would never happen again. It was the next day, and stuff was put up, (you know) barricades, whatever you want to call it safety shields, and the whole works so ya that was very positive. Well like I told you on the, people are kinda afraid to report accidents, I don't think we oughta be afraid to report 'em, (you know) afraid we're gonna get fired or laid off because of it, (you know) that's kind of a pet peeve. (E-4)

> Well like I told you on the, people are kinda afraid to report accidents, I don't think we oughta be afraid to report 'em, (you know) afraid we're gonna get fired or laid off because of it, (you know) that's kind of a pet peeve. Ya, be a little more positive and not come down on ya like you're some kind of criminal because you've had an accident. (E-4)

> The first thing we did was we took the equipment and did our own investigation in the shop to try and figure out what had happened and it turned out that there was a tolerance issue which allowed pressure to be trapped within the tool and when they were breaking it apart the tool basically blew itself apart. Nobody was standing in front of it, one end of the tool shot across the shop. Nobody was standing in front of it so nobody was hurt. We wrote that up in [names company incident management system] and our engineering, our applications group in [names city] and they came up with an alternative disassembly procedure that would prevent even if there was pressure trapped in the tool, it would prevent that similar incident. We then held a meeting out in the warehouse, we placed a couple of tools in vices and had everybody in the entire shop, warehouse, tool hands that were at the district at the time and went through step by step how to inspect tools how to disassemble them, what had happened, we informed everybody what had happened and why it happened to prevent it from happening again. (S-10)

> He was concerned making sure he was alright was anybody else involved was there any spills or anything like that he is truly concerned for people first, their well being and then any property. He is not negative about it when stuff happens he wants to do everything that right, make sure they get treatment, go to the doctor and everything. (S-12)

Related to near miss reporting, all the participants were aware of the requirement, but few participants thought all near misses were reported (actual requirement). The

reason given most often was a lack of time to stop their work and complete a report. Most agreed that significant near misses were reported. Since a near miss event, unlike an incident, does not result in any type of loss, it is easy to move on and not report the occurrence. When the ability to check (e.g., lack of evidence of a loss) on an activity became a bit more difficult, the level of participation appeared to be reduced.

> When we go to the rig, it depends on the severity of it, if it is something where it was a near miss where someone could have gotten seriously hurt, then it definitely gets addressed on the rig site. They are pretty good on most of the rigs about getting different equipment if it was an equipment problem or changing some procedures if there is a safer way of doing things. Most rigs are really good about addressing that. No, I don't. I think probably the severe ones are for the most part, but I don't know, I think I would say complacency again and safety maybe isn't… well, reporting maybe is necessarily something we always see as high a priority even if we take safety seriously writing a report up about it, is a pain and a lot of people won't unless they think it is really serious. (E-11)
>
> Near misses are something that you just fix it and go on. I am trying to get better as far as telling more people about it. It all revolves back to me back in the frame of mind. (E-13)
>
> No, a lot of times you are so busy you don't even think about it. Let's say you are moving pipe and it rolls back and you stuck your hand back and doesn't pinch your hand and you don't even stop. You are too busy to stop. Later, by that time you have forgotten about it. (E-14)

Other participants cited a potential fear of repercussions for reporting the incident or a fear of being seen as making a mistake.

> No, I know they're not, Because I think that people don't want to accept that they made a mistake. (E-7)

> I don't think they are always reported, I don't why, I just kind of think that. It could be that people think it is too much trouble. Maybe, scared of what the repercussions might be if something, even though nothing happened but it might have been close. Anything that might come down. I do think it is a pretty common fear. I have not seen repercussions happen. It's a general thing of you know if something happens I don't want to go and meet everybody and just things of that nature. From the stories that we get from outside. (E-9)

A few participants mentioned pressure at the rig site, not to report incidents, coming from the rig crews because safety bonuses were tied to incident free operations.

> I've never reported a near miss. Really it seems like, umm…I mean I've never gotten this from the guys here, but on the rig everyone seems; you do your best not to report an injury. Because if you get hurt they don't want you back out there. Because then they have to report and people lose safety bonuses, so no one wants anyone getting hurt, unless you're really hurt, and of course they'll tell you …anything you gotta report anything you gotta report anything you gotta report, but then everybody out there is (you know) don't you dare you cut your finger go wrap that thing up and get (inaudible) go hide it unless you're going to the hospital. (E-5)

> No, I think sometimes people are concerned about any push back when you start reporting incidents, I don't know if it is a perceived fear or if it is a real fear in some cases. I think that is part of it and part of it is that sometimes I don't think people realize how significant a near miss is. (S-10)

Overall for safety compliance, a theme of ensuring rule following emerged. Rules and requirements existed in order for safety compliance to have boundaries, but ensuring that these requirements were followed provided a reality of the consequences when compliance was not in place. Employee participants in describing actions that their supervisors took to ensure rule following included proactive items such as auditing and tracking training requirements and reactive processes that included reviews after an incident had happened or verbal counseling and progressive discipline when employees were found to not be following the rules.

> Well, if they see them in the shop that is the biggest way, the supervisor would say something to the employees. (E-12)
>
> Respond by endorsements, they send something out, we have to respond that we read and understand it. Once again, they ask for observations [names system], observations, and things like that and then they track. (E-14)
>
> Let me think about that one, uhhh communications, but I mean that's the communications from that end, it's more like…it's too late its already happened, (you know) it's not preventive its more reactive. (E-3)
>
> Reactionary ya, after an incident would be the only way. (E-5)
>
> Well he does safety audits I know that, and he walks around the shop on occasion,

> he was walking around a couple of days ago um talking with people I know our HSE person does that she walks around every once awhile in the shop and just kind of checks on what people are doing. (E-8)

One employee stated that the supervisor did not take action to ensure rules were followed and this comment came from a directional driller who would not see or generally speak with his supervisor. One of the downsides to this business model is that employees never get a sense of how the supervisor feels or deals with safety issues. The employee participants also indicated that supervisors should rely on their teams to help ensure rule following is working.

> Well I guess through their other employees I mean everybody just kind of works as a team to keep everybody safe I guess. I mean he's not out there bird dogging us all the time, to check on us, so its kinda up to the people on the floor to help everybody out. (E-4)

Supervisors discussed proactive and reactive mechanisms when describing compliance to rules. Generally, they described the HR process for discipline although none were discussing discipline with me at the time. Similar to the employee responses, they mentioned verbal counseling, tracking requirements, and auditing as mechanisms they used. One supervisor mentioned the need to trust employees and another mentioned proper hiring practices to get employees with the right attitude.

> We don't [ensure employees are following safety rules], I hate to say it, but ours is just a trust thing that we have, but I am sure there are some people that are not following it. (S-1)

> Usually we will sit down and I put together a little I don't want to call it a written, or writing someone up, usually I call it kind of a development plan, it's the issues I see that he is doing the things I need him to be aware of and conscious of and we will make sure he has done his safety modules which most of the time address some of those concerns as well and try to make him aware of the things we are concerned about and this typically the first approach and if that doesn't work then you will have to sit down and it will be a formal written warning about his actions. I have had on one occasion as part of the written warning I told the guy he had to put together a safety presentation. This is a guy that would wear sandals on a forklift. So I made him give a safety presentation on the proper maintenance on the fork lift how to run it, the PPE equipment, what you should be aware of and that stuff and if it continues then you have to terminated him. (S-10)
>
> By spot checking, right [out in the field]. Or I pull up out on location and I will see them on the pits and I will watch them at the pit and I make sure they have all their stuff on and be sure they are doing it right. Most of the clients have a strict requirement about PPE. (S-12)

Only one supervisor discussed a proactive approach of communicating the importance of following the rules (procedures) in terms of keeping the employees from being injured, but these actions were also tied to the HR process.

> We stop them immediately explain to em what's going in ah that's kind of a verbal thing at first, ah explain to 'em why what they're doing is not safe or what they're doing is incorrect or anything like and and if they continue to do it, of

> course, we start writing them up (you know) through the HR and a deal where we can do a verbal warning a written warning and then we can give 'em days off and ultimately termination if they continue the same bad habits. (S-7)

In this study, the safety compliance aspect of the workplace safety model strongly emerged from the interview data. Participants knew the requirements for their job functions and expressed adherence to these rules in the large majority of the cases.

One of the aspects of the workplace safety model described by employee and supervisor participants as a motivating leadership trait was safety participation or those voluntary activities that individuals do to help improve safety in the workplace. Specific questions around participation were asked of the participants and the overwhelming responses were typically tied back to required (i.e., compliance) activities. Employee participants referenced safety meetings, JSAs (job safety analyses), observation programs, and risk assessments as a means of participation.

> We have a meeting once a week, with (you know) employees only where we go in and take about a fifteen minute deal and they read a safety sheet to us that has to do with (you know) different stuff, like back injury, hand injuries, eye injuries, protective (you know) equipment to wear. (E-4)

> Employees do the shop inspections and safety inspections and then we have a meeting and then we have feedback. We hear some other safety OTBs from other parts of the company and we discuss them on Fridays. (E-13)

> JSAs, our pre-job or pre…when we fill out our JSAs that say what we are going to do, how, how we are going to do it safely. (E-10)

> We have observation cards that we fill out if we see somebody doing something good safely then we fill that out (you know) let people know they're doing good or if it's a bad thing then we fill that out. (E-4)

A few employee participants mentioned assisting other employees with a safety issues.

> I make people aware that there is a potential problem here and we need to be aware of it, and do whatever we need to prevent it from happening. (E-15)
>
> Yesterday I was down at [names location] helping them with the drive right issues down that way, they're just two doors down; so I try to help out wherever I can. (E-3)
>
> I talk to everybody about safety in case I might be standing and looking and watching what somebody else is doing and if I see something that somebody could possibly get hurt and I say hey let's stop and check this out before we go any further. Because sometimes a second set of eyes is a little better than yours. (E-9)

The resulting theme was that employees were participating in safety meetings and conducting observations, items that are required by the company, but only one (E-3) gave an example of an activity that was a volunteer effort. Supervisor participants mentioned many of the same activities as employee participants, but activities such as celebrating successes and worksite visits were examples of voluntary actions. These are definitely encouraged by the company, but not mandatory.

I used another question related specifically to safety suggestions made by participants as another way of identifying activities that could be classified as

participation over compliance. Half of the employee participants responded by saying they had never made a suggestion and three supervisor participant responded similarly. Given the overall tenure of this group, I was surprised at this level of response. For those employees that did respond with examples, most were related to making a specific aspect of an ongoing job they were working on safer versus an overall activity that could be shared. For example,

> A down hole motor, there is a risk a having trapped pressure against the rotor and stator, I will break it loose and usually I will have them suck it up in the lubricator and if there is trapped pressure it will blow out in that lubricator and it is contained inside that lubricator. (E-15)
>
> The only thing I'd do is just make people not stand somewhere, be it whether, we needed to clean the rig floor, sometimes you get the oil based mud everywhere and it was always ya, you're right we need to do that. (E-5)
>
> I think not really, well, okay I can only really think of one and that was a couple of um, I don't know, about last week I think, we were making up iron to the rig floor and we were attaching a hose to it and it just kind of, it was just like metal iron resting against on the rig floor, and it wasn't like secured and I know if we catch air in our lines, our lines tend to jump, so I was kind of worried that if that line started to jump, like it'd cause a lot of tension and it could move about a lot and could hit somebody, so I mention hey we should really secure that with some chain or something to make sure that (you know) if we do catch air it doesn't move and um the guys are like, they were like okay yah (you know) that's a good

> idea, we'll get somebody on that after the safety meeting. (E-8)
>
> One of them was, well the way we pick up our tools, there is a set way that from experience. I don't know that [names company]has a set way, but when you train you know to do it a set way, it may take longer to do that versus the other way, but you have a set way you do this you pick this up. I have a set way of doing it and the driller may want to do it another way (faster) but I say no, no this is safer. All in all, I say no I am doing it my way because I am more comfortable with this way and that is the way it is going to be for me. They let me do it my way as long as I can show them that it is the better way. (S-1)

As a final opportunity for the participants to provide me with some examples of participation, I asked the participants if there was anything to add related to safety in U.S. land operations. In some cases, the answers resulted in suggestions for improvement. Interestingly, none talked about better leadership as a means of improving safety. They did provide improving hazard identification and training, simplifying requirements, using social networking as a means to share information, having more HSE experts, involving employees in safety decisions that are sent down from the company, preventing complacency, and clarifying whether costs or safety were the priority as suggestions for improvements.

> He had a comment about journey management and an improvement the company could make which included a policy on how much time clients had to provide to allow employees to go out on jobs. Clients needed to understand that there was a certain amount of time for call-outs to give people a certain amount of notice

before going out so that they could plan their sleep patterns and prepare better for the job. (E-11)

Ya, it's almost, (you know) I mean that's actually going out and filling out all the paper work and this and that put it on, put it on like a hub or something on, make it like a, almost like a blog, (you know) put it on (company website)or something, have engineers go in and say, hey (you know) this happened today; this happened today; and then all the other people can look at that and go (you know) and kind of look and see like a blog (you know) like this, ya, okay (you know) that, well oh that happened to me yesterday, and (you know) whatever. (E-6)

I really would like to see us as an industry or even just as a company to kind of like sit one time and say exactly what is safety and to go back to the drawing board and start all over, it's not working. (S-3)

Doing a better a better job of identifying hazards. Not being afraid to pull a stop work card on people. I think crews have done it at least a dozen of times in the past two years. I have a number of people call me in the middle of the night, I'm sorry it isn't safe and I never…and people are always afraid that a client is going to say we don't want you guys work for us anymore, but if you say it in a courteous manner look we have a crew out then and explain to them and most of time it is a 10 minute fix, move that pipe away so that my guy doesn't have to stand on top of it and possibly slip and break his leg. (S-11)

I think you can do like a job rotation, of which is what we use to do again…we had four jobs basically in the shop; (you know) you had disassembly, assembly,

> and then you had a roust-a-bout going on and a QA [quality assurance]; so everything that got disassembled was cleaned and then everything was measured and miked to make sure everything was in tolerance, and you had crews of two's on each of those and every week you would rotate to a new job, that way if you weren't breaking tools down for your whole career in the shop. (you know) you were able to move around and do all the jobs once a month you were doing that job instead of being just the same thing over and over again. (S-7)

These were reasonable suggestions that resulted from simply being asked a question. For the safety compliance and participation aspect of the workplace safety model, there was a clear theme of safety compliance in place and driving behavior of both employee and supervisor participants. Safety participation was exhibited at a much lower level with a number of experienced participants expressing that they had not made a suggestion for a safety improvement.

Why are U.S. land rates higher? This final section of the results recounts the data provided by the participants to the basic questions: why do employees get hurt and why are U.S. land incident rates higher? Participants stated that not following procedures, complacency (lack of situational awareness), fatigue, job overload, lack of experience, hazard recognition, inadequate equipment, old school attitudes, and taking short cuts were reasons employees were hurt. Very often, the participants stated that they were never injured on the job; consequently, I asked a more general question about why accidents happened to expand their thoughts. The responses ranged from a general "there's lot's of reasons", to people being out of shape to more common themes such as

cost cutting, fatigue, human error, lack of experience, lack of hazard identification or training, not following procedures, and lack of situational awareness. Complacency was also mentioned numerous times by the participants, as was routine and redundant work, the pace of work, or non-routine activities.

When I asked the participants why they thought the U.S. land injury rates were higher than in other regions, a variety of positions were again stated including the lack of reporting in other regions and a disbelief that the situation was accurate. Four categories of answers were consistent between the three questions and included higher workloads, lower levels of employee experience, lack of situational awareness, and cost cutting or production over safety. Participants that had worked outside the U.S. generally made the comments about workload. They referenced the Gulf of Mexico, and Europe where the staffing and the allowable hours are regulated to a greater extent than in the U.S. They also referenced clients calling in the middle of the night to get crews out which typically put the employees in a fatigued situation.

> We do a higher volume of work in U.S. land operations versus Gulf coast. You primarily have people working offshore and most of these companies are major oil companies that one, they spend the money to be safe, most of the rigs that the crews will go out on will have a dedicated safety guys on the rig and they do not do as many jobs, most of the operators and engineers in the gulf coast don't drive, they take, have a hot shot company that basically moves the personnel to and from the base so you eliminate the driving hazards you are working for major companies. (S-11)

> Because U.S. land has a totally different mentality than any other place that I have worked, I would say, I think U.S. land mentality is all about speed, I have seen not just us, but the rig crews too, rush, hurry, hurry, that is definitely one thing I have noticed from rig crews to third party companies. (E-12)
>
> Well, uh basically the same reasons I just said (you know) if they get in a hurry and you get a company man that's hurrying you (you know) and you take a short cut to do something faster, (you know) I mean that's where your errors are going to start, and if you don't do a JSA like we have to do (you know) and what that is, is you, well doing a each task they have you do a JSA on the safety and everything on it and parts that could be, have an accident or something. (S-5)

Several participants mentioned that in the US, production was regarded more highly over safety. A shortage of equipment (boom or bust cycle) and independent drilling companies that put less attention to safety compounded this situation. The drive for profit was specifically described for both the company and the clients.

> I would come back mostly to what I just said about experience. When I worked in the Gulf of Mexico, typically every directional driller was over 40, every tool pusher was mid 40s or 50s and even the drillers tended to be in their late 30s or 40s. You tended to have very experienced crews and a lot of times it was crews that had worked to together for a long time. In this district, it is really not like that, it is not uncommon that everybody on a crew, I am talking the drillers that are actively on the rig floor tend to be pretty young. You might have a driller who is 23 or 24 and a bunch of roughnecks that are even younger than that and the tool

> pusher might only be 30 years old. And that doesn't necessarily, it's not directly related to us, but in a way it is...I think when you got the whole rig, it ends up having a lesser focus on safety or a lower level of experience. I think that spills over to everybody on the rig. The overall attitude of the people you are working with. This is the main one. (E-10)

In all, the responses covered many of the categories seen in the literature as influencing safety. Interestingly, even though all the participants knew this study was about leadership, none referenced aspects of leadership as a potential cause.

Summary

In chapter 4, I detailed the process for gathering (i.e., data collection), documenting, and analyzing the data obtained during the field portion of this research project. Approaches to ensuring the quality of the study were discussed as were methods to minimize introducing bias into the analysis. The majority of this chapter was devoted to the results of the research and to answering the two research questions. The first question involved determining the leadership traits the employees and supervisors believed motivated safe behavior and ultimately improved safety performance.

From data provided by the employee participants, the idealized view of the leader that emerged included an individual that led by example or was participative, one that showed care and concern for employees through good relationships and people skills, and lastly a leader that celebrated employee successes when they were working safely. Supervisor participants developed an idealized view of a leader that also led by example and participated in the process, an individual that showed care and concern for

employees, and a leader that celebrated successes (this category emerged in supervisors, but not as strongly as from the employee data). Lastly, supervisors identified leaders that were good communicators especially related to supporting safety. The views of the employee and supervisor participants were similar, varying only in the nuanced degree of the leader traits being exhibited.

The second research question was directed toward investigating how other leader traits were exhibited in U.S. land-based operations especially related to the workplace safety model. When I analyzed the data of the actualized leadership traits observed by employees and supervisors, not surprisingly, a wide array of traits emerged. Some of the traits overlapped with the idealized views (e.g., care and concern, and leading by example), but other aspects of situational leadership traits also emerged such as telling and selling styles. Surprisingly, a category around leader-member exchange leadership did not emerge strongly and rather shockingly, a large number of participants described a lack of leadership from their supervisors.

Even though supervisors identified good safety communication as an important leadership trait, communicating a safety vision and goals was not identified as a common practice. However, in the range of communication aspects, one-on-one conversations and coaching events were the most proactive means of emphasizing the importance of safety and engendering a participative leader. A relatively underutilized opportunity for having these conversations and providing a high level of visibility was worksite visits as described by both employees and supervisors. No participants wanted to see a lower level of this activity, but many thought it needed to be increased.

Key elements of the workplace safety model that were indirectly influenced by leadership included workload pressures, job risk and attitude, commitment to safety, safety knowledge and motivation, compliance, and participation. Briefly, participants acknowledged workload pressures, but the issue appeared to be tied to the specific client experience of the participant. All participants were knowledgeable about the hazards of their jobs and did not express cavalier attitudes towards safety. Safety knowledge was obtained via formal (training) and informal routes (experience in the field), but I did not find a tie in the minds of the participants that training was an important means of being able to work safely. Rather, training was seen as a company or client requirement, something they had to do. Related to the compliance and participation aspects of the workplace safety model, a clear theme of compliance to requirements emerged, but not one of participation.

Chapter 5 presents an analysis and interpretation of the findings detailed in chapter 4. I discuss the practical application and implications of the findings to the company under study and more generally for U.S. oil field service companies. Lastly, recommendations for further investigations into the issue of work place safety in U.S. land operations are provided in addition to the implications for social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Keeping employees out of harm's way and preventing workplace injuries is a goal of safety practitioners and conceivably every supervisor and manager responsible for employees. The purpose of this study was to conduct an exploratory investigation into the role of leadership in influencing the elevated injury rate for employees working in the U.S. land-based operations of an oil field service company. Injuries, measured by the total recordable incident rate and the lost time rate (also known as the days away from work case rate), trend higher in U.S. land operations than any other region in the world as measured by industry associations (e.g., IADC, OGP) and individual company records. While safety practitioners and industry representatives have known about this trend for years, no scientific studies had been previously conducted to investigate the reasons behind this phenomenon.

I conducted a grounded theory study investigating the role of leadership using a structured questionnaire to interview 27 individuals working in the U.S. land-based operations of an oil field service company. This chapter provides a summary of the findings identified in chapter 4 and the interpretations of these findings in the succeeding section. I also provide recommendations resulting from the study, the implications for social change, recommendations for future studies, and the conclusions of the interpretations of the findings. A final section includes my reflections on the qualitative research process.

Summary of the Findings

Study participants provided in-depth data intended to answer the two main research questions that guided and framed the research:

1. What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different?
2. How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company?

Fifteen employees and 12 supervisors participated in this study and provided data to answer the research questions. Employees and supervisors provided data that enabled me to determine the idealized leadership style that would motivate employees to work safer and consequently lead to improved safety outcomes in the form of reduced injuries. The idealized leader emerging for both the employee and supervisor participants was an individual that led by example, generally with good safety behaviors and participated in the safety process with the employees. Both groups agreed that a leader who cared about and was concerned for their employees' well-being and one that celebrated successes (i.e., provided positive feedback for safe behavior and activities) would positively influence good safety behaviors. The supervisor participants also identified leaders that were good communicators especially around the importance of safety as critical to improving safety performance. The two groups generally agreed upon the leadership style of their idealized leader, but there were differences in degree as employees were

stronger in their call for leaders to celebrate successes or provide positive feedback on safe behavior than the supervisors. Supervisors directly added communication as an important factor while employees indirectly identified this aspect in relation to developing good relationships.

The actual situation of leadership style manifestation in U.S. land operations painted a picture somewhat different from the idealized view. Key gaps included a lack of participation in the form of work place visits, a reduced level of positive feedback and safety communication, and in the worst cases, a lack of any leadership and interaction between the supervisors and employees. A variety of styles emerged including those that did match the idealized view such as caring and concerned leaders where these traits fostered good relationships. Participative leaders were identified, as were leaders that were directive in their style whether falling in the selling or telling quadrants of situational leadership.

The second research question involved the investigation of other leadership traits manifesting in U.S. land supervisors and managers. Starting with the key leadership aspect of communicating a vision and goals to employees, a key gap was identified in the overwhelming lack of discussion around a safety vision and goals. These key communication vehicles were surprisingly absent, although communication about safety was identified. Communication levels ranged from nonexistent, for those supervisors and managers that did not interact with employees, to the most proactive level of safety communication, namely, using conversations and coaching to instill the importance of safety.

Further, leader visibility was identified in the literature as a driver of good safety performance (Luria et al., 2008; Zohar, 2003). The theme of visibility emerged as an underlying concept of the participative leader as employees saw work site (especially rig site) visits as an important way for leaders to not only be visible to their employees, but also allow them to participate in the safety process. Both employee and supervisor participants wanted leaders to be more visible and more engaged with their employees.

The literature indicated that leaders could not only directly influenced the safety behavior of employees through their leadership style, they could indirectly impact this behavior through other aspects included in the Christian et al. (2009) workplace safety model. Specifically, leaders influence employees through their own safety commitment and knowledge, awareness of job risks, and their safety attitude. For example, they mediate the amount of time employees have available to gain safety knowledge and participate in compliance and voluntary efforts. I found that employees and supervisors were well aware of the job risks, but supervisors relied on OJT and other passive methods of employee awareness versus taking an active role in helping the employees understand job risks.

In terms of a safety commitment on the part of the supervisors influencing employee safety motivation, there was heavy emphasis on the company push for safety and less so on the personal push from the supervisor. Being motivated to work safely is one part of the equation, but having the knowledge of how to work safely is different. Both formal and informal mechanisms of knowledge transfer were identified, such as training programs and peer sensing making. However, few of the participants associated

training with providing the knowledge necessary to keep employees safe; instead, training was seen as a requirement of the company and clients.

The final key aspects of the workplace safety model investigated in this study were compliance (adhering to safety requirements) and participation (voluntarily going beyond compliance activities to improve safety). In this area, I determined that safety requirements were well known to the participants and supervisors were generally acknowledged to enforce these requirements. However, lower levels of participation behavior emerged from the data to a degree that a majority of participants had never made a suggestion to improve safety activities. A number of researchers (Babcock-Roberson & Strickland, 2010; Neal & Griffin, 2000, 2004) identified participation as an important driver of good safety outcomes.

As a final aspect of the study, I asked the participants why they thought employees were injured and why U.S. land injury rates were higher than in other regions. Participants provided numerous reasons, but the key themes emerging from the data were a higher workload than in other regions, lower levels of experience of the employees, a lack of situational awareness on the part of employees and cost cutting or production over safety. None of the participants mentioned poor leadership as a factor.

Interpretation of the Findings

This section provides the interpretation of the findings related to the research questions and within the broader context of the relevant body of research. The evidence collected in the field phase of this qualitative study and provided by study participants delimits the bounds this section.

Researcher Question 1

What aspects of leadership style do employees and supervisors describe as important while discussing safety performance? Are the views of employees and supervisors different? Data provided by the employee participants developed into three themes describing their idealized leadership traits influencing good safety performance: care and concern or people oriented, leading by example or participative, and leadership that promotes safe behavior through the celebration of success or positive feedback. These three themes tie to aspects of transformational leadership at the active range of the full range leadership model (Bass & Riggio, 2006) and safety specific transformational leadership (Barling et al., 2002). Specifically, the theme of care and concern for employees aligns with the individualized consideration aspect of this leadership style where leaders react to and try to meet the needs of their employees. In a study conducted by Mearns and Reader (2008) at an offshore installation, care and concern for employee's well being was found to enhance safety performance similar to the findings in this study.

Further, when describing caring and concerned leaders, employees established a tie to the importance of good relationships highlighting an important tenet of leader-member exchange theory where good relationships drive successful leaders and followers (Graen & Uhl-Bien, 1995). As described by Neal and Griffin (2000, 2004), good relationships between employees and supervisors help drive employee safety participation which was identified in the meta-analysis by Christian et al. (2009) as a proximal driver of good outcomes.

Care and concern for employees also tended to engender trust in the leader which has been shown to be related to good performance (Kath et al., 2010) and also to encourage employee voice and participation efforts (Barling et al., 2003; Flin & Burns, 2004). The construct of trust did not emerge as a core leadership category in this study, but participants cited it as important when judging whether coworkers or employees would improve or detract group safety outcomes.

The next theme involved a leadership style that was identified as leading by example or participation. This theme aligns with the idealized influence aspect of transformational leadership whereby leaders model appropriate safety behaviors for employees to emulate such actions as not taking short cuts to eliminate the time consuming safety steps (Barling et al., 2002). This theme also matches an aspect of situational leadership in which the leader provides guidance and support for conducting the work in a safe manner. In this instance, employees wanted leaders that would show them the way to good safety performance. Managers that simply stated the importance of working safely, but did not model the way for employees diminished their level of integrity in the eyes of the employees leading to reduced safety behaviors (Dineen et al., 2006). Further in a study conducted by O'Dea and Flin (2001), participation (along with high quality relationships and good communication) emerged as the best leadership practices for driving safety outcomes on offshore installations.

The last theme emerging from the employee data was of a leader who would celebrate successes or in other words provide positive feedback for the appropriate safety behaviors. As was illustrated in chapter 4, employees often had to show courage in order

to choose the safe route and stop the job at the rig site. They wanted to know that these actions were the right things for them to do and they needed reinforcement for future efforts. This theme aligns with the inspirational motivation aspect of transformation leadership whereby the leader spurs appropriate behaviors through reinforcing feedback of the desired behaviors and activities. Positively reinforcing safe behavior over behavior focused on short cuts or production at all costs has been shown to be necessary to drive employee safety behaviors (Luria et al., 2008, Zohar, 2008).

Positively reinforcing safe behaviors also moves employees past the tendency to discount only probable outcomes (e.g., injuries through skipped steps) and overweight certain outcomes such as being seen as an efficient employees (i.e., getting their work done faster because they skip the safety steps). Theorists (e.g., Kahneman & Tversky, 1979) have described this human tendency of underweighting/overweighting, which has been empirically observed in action related to safety behaviors (Burke et al., 2006; Lu & Yang, 2010; Zohar & Erev, 2007). Further, if this positive reinforcement is absent from leaders, employees may look to peers for the appropriate cues about safety priority (Choudhry & Fang, 2008). In the current situation, since employees can work for a variety of clients and in many different locations, positive reinforcement from their leaders is the only guarantee that they will get the appropriate message of working safely.

Data provided by supervisor participants in the study resulted in four emergent themes, the same three described above, and a fourth theme of good communication especially around the importance of safety. This theme aligns with the intellectual stimulation aspect of transformational leadership. The communication supervisors

sought could help allow them to develop novel solutions to the problems faced by their employees or help them to communicate the priority of safety (Thompson et al., 1998). The leader as a good communicator of safety priorities theme may also be reflecting the findings of Cooper and Phillips (2004) and Zohar and Luria (2003) indicating that even when supervisors were supportive of safety, they still needed support from their managers to be effective in driving safe behaviors. Employees also made indirect reference to communication as a means of fostering good relationships so overall, employee and supervisor participants in the study had very similar views around the important aspects of leadership in driving safety performance.

The communication theme emerging from the supervisors' interview data may be tied to the leader's role in sensegiving that is used by individuals to determine which behaviors will be rewarded (Hofmann & Morgeson, 2004; Weick et al., 2005). A Leader communicating about safety is important not only for the priority setting that it implies, but also in the ability to influence employees to speak up (i.e., employee voice) and identify safety issues (Detert & Burris, 2007). Employee voice did not emerge as a theme in this study; instead, a lack of safety suggestions predominated.

Neither the employees nor the supervisors provided data for an idealized leader that the merged around a theme of transactional or laissez-faire leadership from the full range leadership model. This result is not surprising as a laissez-faire leadership style was found to be detrimental to employee safety (Kelloway et al., 2006) and consequently not likely to be cited as an idealized style for motivating good performance. A similar situation exists for a transactional leadership style (Howell & Hall-Merenda, 1999)

especially when little opportunity for routine work exists. Further, the other quadrants of situational leadership also did not emerge in the idealized view of leadership style.

The idealized view of leadership motivating safe behavior and ultimately driving improved performance was similar to the three-factor model indentified by Zohar and Luria (2005) which included caring (direct tie), coaching (positive feedback), and high climate scores (index not measured in this study). The results of the current study are in line with the first two aspects of their model.

In summary, similar to a number of researchers (e.g., Barling et al., 2002; Dineen et al., 2006; Mullen & Kelloway, 2009) transformational leaders were described by employee and supervisor participants as the type of individual that would motivate safe behavior and ultimately improved safety outcomes. Aspects of leader-member exchange and situational leadership did emerge, but only as related aspects to the transformational leadership traits. Perhaps a stronger theme of situational leadership did not emerge because I did not probe the participants for examples of the leader changing styles under different circumstances as Hersey et al. (2008) envisioned of good situational leaders. I found aspects of leader-member exchange, specifically the importance of communication, but it did not emerge as an overriding driver for the idealized leader.

Further, this study investigated the role of leadership from several levels within an organization, from the employees' view and from the supervisors' view. This multilevel view is important as previous researchers (e.g., Yule & Flin, 2007; Zohar, 2002a) have identified differential impacts based on organizational levels. In this study, the results for the employee and supervisors' views about the idealized leader were similar.

Research Question 2

How do various leader actions (e.g., communication, visibility and visioning, care for employees, commitment to safety) manifest in the land-based operations of an energy service company? In addition to providing data on their idealized view of leaders, employees and supervisors provided data on the realized view of leadership in U.S. land operations. Most disturbing for both groups was the high percentage of laissez-faire leadership described. This type of leadership was not described as motivating to safe behavior in the literature review (Kelloway et al., 2006), nor did it come across as motivating in this study. Under this scenario, the leaders' lack of interaction eliminates their ability to monitor or guide employee behavior, which is an important criterion for driving safe behavior (Luria et al., 2008). I did not study whether the level of this type of leadership was higher in U.S. land-based operations versus other regions, but it is clear that this lack of leadership affects other aspects of the workplace safety model (e.g., visibility, communication, and participation) important to good safety outcomes.

In the employee data, this type of leadership (i.e., laissez-faire) was limited to a particular product line (directional drilling); one where employees generally do not return to a company base between jobs so the opportunity for easy contact is limited. The risk profile for this group is lower than for some of the other product lines so this aspect may be a moderating factor for employee injuries. However, as these product line employees move up to supervisor levels or to other product lines, this lack of leadership interaction will be their basic experience and may carry through to other more risk prone work sites. This concept has some partial support in the current study as the supervisor participants

that identified this type of leadership style in their managers were from a broader distribution of product lines from the company.

Beyond this surprising frequency of laissez-faire leadership, study participants described a range of leadership styles from transactional to transformational with all quadrants of the situational leadership style identified. This result was not unexpected as a broad swath of individuals was selected for the study and a wide range of leadership styles manifested. This result is similar to findings of the O'Dea and Flin (2001) study of leadership styles on offshore platforms in the North Sea where each style studied was almost equally distributed.

Even though a broad range of leadership styles manifested in the current study, when participants did identify changes they would like to see in their supervisor's style, employee participants expressed a desire for traits identified in their idealized leaders. The aspect of increasing worksite visits came through as an activity that could trigger each of those dimensions (e.g., participating, showing care and concern, and celebrating successes). Worksite visits were also identified by Fernández-Muñiz et al. (2007) as important leadership activities in driving improved safety outcomes. Supervisor participants also provided examples of increasing participative efforts as actions they would increase in direct agreement with the results of O'Dea and Flin (2001) and Fernández-Muñiz et al. (2007).

In addition to the realized leadership styles, are the manifestations of the other aspects of leadership influence and the work place safety model. Starting with the concept of leaders transmitting an idealized view of the safety future, namely, the vision,

I found little evidence of widespread communication of a vision and only low levels of discussion about safety goals. This result appears to be especially relevant when considering the supervisors' idealized leader as someone that communicates the importance of safety. Without a safety vision, it may be difficult for employees to understand the importance and relationship of all the activities required by the company to drive improved performance. This thought is supported by the nearly absent comments about safety training being important as a means making employees knowledgeable to protect themselves from harm. Communicating safety visions and goals have been identified as mechanisms for identifying the importance or priority of safety (Thompson et al., 1998)

Further to the point of communication, not all conversations were equally supportive of safe behavior. Communication, occurring as a result of a negative incident (reactive), could have an overall negative effect on morale or outlook on safety (Howell & Hall-Merenda, 1999) and could be similar to receiving mixed messages (Mullen & Kelloway, 2006). When supervisors used a more active communication approach, such as discussing safety with employees at safety meetings (already required by the company), or even better in one-on-one coaching sessions, employees responded well. The one-on-one sessions have the added benefit of identifying the supervisors as concerned about employees. Discussing safety with employees can be an aspect of sensegiving that allows employees to interpret the true level of importance given to safety by the supervisor (Hofmann & Morgeson, 2004) and influence the employee's behavior. A point that emerged from the study is that if employees are not hearing any message or

mixed messages about safety, they will turn to peer sensemaking as a means of helping to determine the appropriate behavior in the relevant group similar to results identified by Weick (1995).

As a final point regarding the importance of safety communication by supervisors, the participants indicated that safety messages from a direct supervisor carried more weight than messages from senior leaders of the organization. While a good number of participants thought the driver was the message and not the person, this concept also supported a supervisor providing the message as senior leaders will have less frequent opportunities to communicate with employees.

The view of employee communication about safety or voice has equal importance in dealing with work place pressures (Turner et al., 2005) and in participation activities. In this study, employee participants acknowledged the importance of these two aspects, and some could provide examples of stop work efforts (the ultimate use of voice), but few had provided suggestions for safety improvements during their tenure with the company. This lack of voice or participation on the part of the employees may be limiting improvements in safety performance.

Leader visibility. Intricately tied to providing a vision and communicating is the visibility aspect of leadership. In order for leaders to be able to share a vision, encourage and motivate employees, and positively reinforce safe behaviors, they need to be visible (Luria et al., 2008; Zohar, 2003). This aspect of leadership emerged as a valued activity by both employee and supervisor participants as described by their comments related to work site visits. Everyone agreed this activity required increased effort. Worksite visits

serve several additional purposes such allowing the leader to engage the employees in a safety discussion, providing guidance in the appropriate activities, reinforcing positive activities, building relationships, and ultimately being perceived as both a participative and caring leader (Fernández-Muñiz et al., 2007).

While clearly desired, increasing worksite visits may be challenging in the U.S. land business model as leaders are often remote from their employees or have a large number of direct reports. The amount of time leaders have to devote to worksite visits will be limited by these conditions and may prevent supervisors from providing important feedback on appropriate behaviors (Luria et al., 2008). On a positive note, the results of at least one study (e.g., Ruggeri, 2009) found that this lack of physical visibility could be overcome through virtual efforts such as phone and computer contact although some level of site condition knowledge and employee behaviors would still be required.

Leaders that are visible to their employees also can take the opportunity to communicate with the employees related to workplace pressures of production and approaches to balance the need for both production and safety (McLain & Jarrell, 2007). Previous studies identified a focus on production over safety negatively influencing safety performance (Brown et al., 2000; Choudhry & Fang, 2008). In this study, participants identified workplace pressures as creating conflict between engaging in safe behaviors and meeting client's expectations (e.g., driving fatigued to service clients). Leaders that engaged in the transformational leadership trait of intellectual stimulation would be able to urge employees to identify novel solutions to this conflict allowing both safe behavior and productivity. Hofmann et al. (2003) identified good leader-member

exchange relationships as a means for supervisors and employees to overcome workload pressures to address safety. In this study, supervisors indicated that their relationships were similar with all employees. This situation is positive if the employees of these supervisors believed the relationships were in the high leader-member exchange category and responded according to theory expectations.

Job risk and job attitude. According to the workplace safety model (Christian et al., 2009), employees must have a level of awareness and respect for hazards they face at work in order to be able to match their behaviors to the risk. In the current study, all study participants had a good awareness for the hazards they faced and measures they should take to protect themselves. This finding supports early work done by Flin et al. (1996) at offshore installations in the North Sea where study participants were similarly well aware of the hazards and risks they faced.

Overall, participants described a lack of proactive actions taken by supervisors to aid in helping to identify job risks; there was reliance on peers and OJT as the primary mechanisms. For the study participants this situation seemed to be enough; however, company records indicate that failure to identify hazards and assess risk as the most frequent reasons for injuries would indicate that overall, this approach may not be generally sufficient. Further, as shown by Antonsen (2009a; 2009b) asymmetrical power relationships between client representatives and employees can override risk concerns expressed by employees especially without positive reinforcement or assistance from supervisors. The lack of formal supervisor action in this process may also have a disproportionate impact on new employees since obtaining hazard awareness through

experience and other informal means takes time on the job and opens those new to the work a window of injury-prone learning events.

Safety attitude and commitment to safety. Leaders influence employees' perception of their commitment to safety through the level of safety communication and actions dealing with safety issues (Burke et al., 2008). Managers that had higher levels of informal safety communications, worksite interactions, and contributions to safety meetings were found to positively influence safety performance in previous studies (Fernández-Muñiz et al., 2007; Yukl & Flin, 2007). In the current study, a strong theme of company commitment emerged from participants; in other words, most participants voiced the position that the company was committed to safety. Participants identified leaders less frequently as committed to safety. The under pinning to this theme may be the result of mixed messages that participants received from their leaders. Specifically, when leaders did not share a safety message or their actions were inconsistent with their message, employees would not view them as committed to safety. A lack of this commitment, which may be exhibited through the level of worksite visits, can be influencing employee behavior in the wrong direction.

Safety knowledge and motivation. Knowledge and motivation combine to enhance safety performance by providing employees with the necessary information to enable appropriate protective behaviors and the drive to take action (Alper & Karsh, 2008; Arezes & Miguel, 2008). Participants identified various modes of obtaining safety knowledge including formal training. The surprising finding was that few if any participants described formal training as anything more than a requirement of the

company and clients. The association of safety training as an important process in providing employees with the necessary tools to keep themselves safe was missing. Burke et al. (2006) identified formal safety training as a mechanism promoting safe behaviors and high quality training as a means of increasing commitment to safety. A lack of a strong response around this area may indicate the quality of formal training needs to be improved or a stronger communication message developed.

More clearly developed by the participants in this study was the idea that positive reinforcement was important to encouraging safety motivation. Positive reinforcement is important to good safety outcomes (i.e., lack of injuries) since on its own, the lack of injuries is not inherently motivating (Mearns & Reader, 2008). Without the celebrations of success, nothing spectacular is happening to encourage employees to continue taking steps to focus on safety. Concurrently developed by the participants was the theme that this positive reinforcement needed to be increased.

Compliance and participation. The meta-analysis conducted by Christian et al. (2009) identified safety compliance and participation as the most directly influential drivers of safety outcomes. Safety compliance depends on employees following the procedures and policies developed to guide appropriate safety behavior and participation consists of those voluntary actions that employees take to identify hazards and work towards improving safety activities that can drive improved performance. A key finding from the literature was that both elements were required in order for safety performance to improve (Clark, 2006; Ford & Tetrick, 2008; Neal & Griffin, 2006; Zohar, 2008). In this study, participants consistently identified compliance activities as key efforts in place

to address safety performance. Further supervisors were seen as rule enforcers and engaged in compliance activities (e.g., wearing PPE) when questions about how they set a good example for safety. This aspect of the workplace safety model seemed well aligned to the U.S. land situation.

In contrast to compliance activities, I did not find a strong theme of participation in this study even though several approaches to uncovering examples of participative behaviors were attempted. Few participants reported making any suggestions for improving safety and this finding is concerning especially in light of previous research showing participative activities having a greater influence over safety performance than compliance activities (Barling & Hutchinson, 2000). Compliance behaviors are generally only effective under routine situations while most situations encountered by employees require novel solutions (Zohar, 2008). Many of the compliance activates cited by the participants were important and necessary; however, even the proactive-leaning compliance activities such as near miss reporting were diminished when there was little opportunity for monitoring.

In considering the various degrees of communication uncovered in the study with numerous examples of a lack of communication and very reactive communications, the opportunity for employees to exercise their safety voice as a means of increasing participation appeared to be limited. Encouragingly, when participants were asked what more could be done to enhance safety, a number of examples included participatory activities. Further, when simply asked for some suggestions for improving safety performance, many of the participants were able to provide examples involving

participative behaviors including some rather novel items (e.g., using social networking media as a means of keeping employees in touch with safety information).

Since high leader-member exchange relationships did not emerge as an overriding theme, the lack of participation activity may be a result of supervisors not developing relationships that encourage employees to go beyond compliance activities. Further, less than proactive communication efforts may not afford employees the opportunity to express their voice and provide suggestions.

Safety culture and climate. Intertwined with the concepts detailed in the previous sections are safety culture and climate. Neither of these constructs were the direct target of this investigation; however, aspects of both are touched upon in the study, as climate is the snapshot of the employee's perceptions of the priority of safety in the organization. When asked directly, most participants did state they felt that safety was a priority. However, similar to findings by Burns et al. (2006) related to safety specific trust, the participants' may have been sharing their explicit and not implicit views on safety climate. Certainly, examples of management commitment, care and concern for employees, procedures and rules emerged, but elements of Haukelid's (2008) Texas culture were also identified.

Participants described elements of safety climate, such as the willingness to report incidents, management communication about safety priorities, and their commitment to safety. Climate elements that were missing included communication about safety visions and goals and voluntary participation in safety activities. More than likely, a variety of climates exists as identified by (Richter & Koch, 2004) reflecting previous work cited by

Christian et al. (2009) in their comprehensive meta-analysis on the subject and I had only scratched the surface in this study.

Why U.S. land injury rates are higher? Participants were interviewed on a variety of topics and asked directly about their views on why employees were injured and why the injury rate in the U.S. land region was higher than in other regions. Participants identified many of the factors found in the literature, such as lack of situational awareness, hazard awareness, complacency, lack of experience or knowledge, and others related to increased injuries. Four themes emerged from this part of the interview, specifically, higher workloads, lower levels of employee experience, lack of situational awareness and the focus on production.

I note that the opposites of these four themes were cited as some of the reasons that HROs manage to keep injury and incident rates low in spite of highly hazardous situations. For example, situational awareness, slack time, practical knowledge (experience), and appropriate resources have been cited as reasons for HRO success (Pettersen & Aase, 2008; Sneddon et al., 2006). Transformational leadership was also identified as one of the keys aspects resulting in good performance at HROs (Pfeffer as cited by Zacharatos et al., 2005), but leadership or lack thereof was not mentioned very often by the participants in this study. Interestingly, leadership style and quality is likely more easily influenced than any of the key themes identified by the participants in answer to the question about increased U.S. land rates. Specifically, client staffing levels and consequently, workloads are difficult for a service company to influence as described by several participants. The lack of experienced workers can only be changed through stable

economic conditions and time, and a focus on production versus safety is client specific and would require a change in business model to alter (e.g., not doing business with certain clients).

Implications for Social Change

All research should have a purpose, at the very least to add to the body of knowledge. A lofty purpose indeed, but Walden University's purpose of social change comes closer to the ultimate contribution a researcher can make. For a Walden researcher, social change translates into the following aspiration, "…a deliberate process of creating and applying ideas, strategies, and actions to promote the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies. Positive social change results in the improvement of human and social conditions" (p. 5, Walden University Catalogue, 2010).

In the current study, I investigated and developed a series of ideas around leadership and related aspects that if implemented would promote the reduction of pain and suffering caused by workplace injuries and fatalities at the company studied. Employees in the energy industry are often placed in hazardous situations and need to understand how to keep themselves safe. Their supervisors hold an especially important role in this process and acknowledged their responsibility. By implementing the recommendations for further action identified below, the supervisors and companies will have additional tools for their kits to achieve their responsibilities and decrease the number of employees being injured. By sharing the information identified in this study across the sector, I have the opportunity to influence an industry that has struggled with

elevated injury rates despite best efforts for improvement. My vision is that injury rates in U.S. land operations not only fall significantly below other regions, but also achieve zero levels in the not too distant future.

As illustrated by the recent significant event in the Gulf of Mexico (i.e., Deepwater Horizon disaster), the energy industry operates in highly hazardous situations with the potential to affect numerous lives. Recommendations leading to effectively reducing this potential for harm to people will benefit the employees, the industry and especially society that still relies upon the output of this industry for daily existence.

Recommendations for Further Actions

I conducted an exploratory study on the role of leadership in influencing safety outcomes in the U.S. land-based operations of an oil field service company. Based on the results of this study, I identified a number of recommendations for further action, which are detailed in this section. Numerous researchers have identified leadership as an important driver of safe behaviors, motivation, and participation in various industrial settings, but the influence of leadership in the U.S. land setting had not been previously scientifically studied. In this study, several aspects of leadership driving safety behaviors and motivation were identified; however, the connection between these aspects of leadership and safety outcomes was not always transparent to the participants. As an overall approach, I recommend that communications around the influence of leadership and specifically the leadership traits identified by the participants in describing their idealized leader be developed and shared throughout the organization and the industry. These messages may be apparent to senior leaders in the organization, but they are not

universally known at the employee and supervisor levels. Safety practitioners are well placed to spread this message within individual companies and the industry through technical conferences.

Since aspects of the idealized leader align with elements of transformational leadership, the existing level of leadership could be elevated through widely available leadership courses focusing on transformational leadership. These courses have been previously found to be successful in elevating leadership focus on safety (Barling et al., 1996; Colligan & Cohen, 2004; Mullen & Kelloway, 2009; Zohar, 2002b). HR departments could add this type of training to their standard suite of training and development programs. Further, the level of laissez-faire leadership within the organization should be reduced since this leadership style has been shown to be detrimental to employee safety and was reported at surprisingly high frequency by participants. A reduction in this type of leadership style may be an indirect consequence of the transformational leadership training or from a focused approach of assessing and developing individual leaders.

A specific activity that current leaders, especially first-line supervisors and their managers should undertake is to plan work site visits as a starting point for their schedules instead of trying to fit them into schedules. The latter approach is unlikely to be successful given the business model constraints of a large number of direct reports and remote employees. Alternatively, senior leaders of the company can assess this business model and determine whether it is appropriate to change in order to improve safety outcomes and potentially business performance.

Planning the work site visits with a proper schedule and plan that includes a prior communication of the process and the intent would provide leaders with the opportunity to not only exhibit participative behaviors, but also communicate the priority they place on safety to the employee population. Their visits would be prime opportunities for one-on-one conversations about safety that could lead to increasing the level of employee voice around safety. When supervisors visit new employees at the worksite, this activity would be an opportunity for them to help these employees learn about the hazards of the position and the efforts they need to take to protect themselves. These visits would provide a strong message to the new employees that safety takes a priority for the supervisor and that rewards will be tied to working safely and following the rules.

The worksite visits would allow the leaders to assess whether the knowledge level of employees was adequate and take corrective action such as providing additional formalized training. Safety training in general should be assessed by the company HS&E organization to determine effectiveness and to build in the message that the knowledge employees obtain through training is important in keeping them safe and not just a company or client requirement that must be endured. Burke et al. (2002) have shown that the amount of training (depth) aids employees in dealing with routine situations while the breadth of training improves their ability to address novel situations. Ascertaining whether current training programs meet both aspects is a further recommendation for the training department.

Supervisors would also accomplish increased participatory levels if they became more involved in the training process of their employees. At the very least, voicing their

support for formal training and communicating the tie between training and safety knowledge necessary to keep employees safe. Supervisors should receive targeted safety training (e.g., safety leadership, and safety responsibilities) in order to aid them in communicating with employees. Larsson et al. (2008) found this approach to be successful in elevating the focus on safety.

Communications in general should increase and be used as a mechanism for ensuring safety is seen as a priority not only by the company, but also specifically by the leader. This approach would also help make the message personal and begin the process of leaders explicitly showing a care and concern for the employees. A consciousness regarding mixed messages (between verbal and physical actions) should be kept in mind by the supervisors to not detract from the improvement process. At the top of the list of items to communicate to employees will be the overall vision for safety at the company and the corresponding goals. The participants identified surprisingly little discussion on vision and goals. Transformational leaders should create opportunities to discuss a vision to ensure followers understood where the company and that leader were heading. Safety meetings are a required activity at the company and supervisors could capitalize on these venues by adding discussions about the safety vision and goals. Further, since a number of participants mentioned missing safety meetings due to work restrictions, supervisors should consider planning mitigating actions similar to those described by a supervisor participant in the study (e.g., held safety meetings at rig sites).

Supervisors and managers within the company should also identify opportunities for celebrating successes or providing positive feedback when employees have gone to

extraordinary lengths to stop risky activities or simply in situations where they followed all the required procedural steps. A number of opportunities would be available especially if the worksite visits were a regular aspect of their schedule. This recommendation is addressed to organizational leaders in terms of increasing existing efforts and to the HSE organization in terms of developing formal avenues for supervisors to access.

A final important recommendation for the company is to understand the importance of voluntary safety participation in driving safety outcomes and to take steps to increase these activities. Participation did not emerge as a strong theme in this study to the extent that a number of participants had never made a suggestion for safety improvement. Since good suggestions were provided by participants simply when asked, it seems reasonable that a wealth of opportunity for improvement exists within the employee population. Consequently, the simplest recommendation would be for supervisors and managers to add a question about safety improvements to their conversations with employees. Various organizations have safety suggestion programs in place, which typically consists of written suggestions submitted to a box. In this instance, other aspects of transformational leadership could be exercised if this effort was done in a conversation with employees. As the supervisors gained experience and comfort with this increased level of communication, additional efforts such as group discussions during safety meetings could build upon these initial efforts.

Recommendations for Further Study

This exploratory, grounded theory study is the first to investigate the role of leadership in influencing safety performance in the U.S. land-based operations of an oil field service company. Themes of transformational leadership were identified by the participants as motivating to safety and ultimately leading to better safety outcomes. An obvious recommendation would be to recreate this study in a number of different regions to improve the generalization of the results and further explore the elements identified by the participants as different (e.g., workload, and staff experience levels) in U.S. operations.

A second recommendation for extending the results of this study would be to design a study that would assess the levels of the key leadership characteristics of supervisors and correlate these levels to the safety outcomes of the organizations influenced by the specific supervisors. In other words, do subunits of the U.S. land-based organization with transformational leaders have better safety results than subunits with nontransformational leaders? Answering this question might be accomplished by matching supervisors and employees and conducting a qualitative study or by measuring leadership traits through established instruments and using a quantitative approach.

A third recommendation would be to investigate the levels of any of the other leadership characteristics (e.g., visibility) or aspects (e.g., participation) identified in the workplace safety model and determine whether a correlation to safety outcomes existed. In this study, worksite visits emerged as an activity that if used appropriately could influence a number of the levers of good safety performance. An exploratory study

surrounding worksite visits and the approaches that emerge as most effective would provide additional direction to supervisors and safety practitioners in designing an effective approach.

A final recommendation for future researchers interested in safety performance would be to recreate a similar exploratory study in other industries that have similar trends to the one studied in this investigation, namely disproportionate injury rates in U.S. or other regional operations. Keeping employees from being injured is likely a universal goal for many industries and additional knowledge of these drivers could ultimately improve safety performance for all industries.

Reflections

At the beginning of the journey, I was a novice qualitative investigator having conducted mostly quantitative studies previously. Apprehensive was a good descriptor for how I approached this effort, but more experienced and appreciative of the power of qualitative research was how I came to the close of the journey. The power of simply asking questions to obtain remarkable information was an exciting discovery. The field portion of the study was extremely enjoyable for me and the participants were all amazing in their willingness to provide their time and their insights.

Living with chaos summed up my feelings during the analysis phase of the project, but knowing that order would eventually emerge was a fact learned during the Knowledge Area Module process. These preparatory requirements were an effective experience to build confidence and gain knowledge of the process. I finished this project

with a newfound excitement about qualitative research and its powerful ability to uncover previously unknown knowledge.

Conclusions

For a number of years, a trend of elevated injury rates has existed for the U.S. land-based operations of the oil field service company at the center of this study as well as the energy industry in general. Previous researchers identified a number of drivers of good safety performance with the majority of the aspects focused on leadership. This exploratory study investigated aspects of leadership through the conceptual framework of the full range leadership model (Bass & Riggio, 2006), situational leadership (Hersey et al., 2008), and leader-member exchange (Graen & Uhl-Bien, 1995).

Employees and supervisors generally agreed upon their idealized aspects of leadership driving safety motivation and ultimately good results, which included the four aspects of transformational leadership. Specifically, idealized leaders were participative or led by example, were caring and showed concern for their employees' well being, celebrated successes (positive feedback), and for supervisors, communicated about the importance of safety as a priority. While aspects of these traits were revealed in the realized view of leaders, it was clear that participation or leading by example needed to be increased as was shown through the dialogue around worksite visits. This same worksite visit dialogue provided a venue for allowing leaders to get to know their employees, their concerns and ultimately to be seen as caring and concerned. Celebrating successes was acknowledged to occur, but clearly needed to be increased especially if

employees were to overcome barriers to safe behaviors such as workload pressures and the tendency to economize on procedural steps.

Communicating about safety came through clearly as needing to be elevated starting with dialogue about a vision and safety goals. Communicating the vision would be a good starting point for increasing the level of safety participation that was so surprisingly low in the study population. Since communication is a critical aspect depicted in the Christian et al. (2009) workplace safety model, efforts to increase participation through communication should provide a good opportunity to influence safety outcomes.

Finally, the participants identified a number of differences they experienced between working in U.S. land operations versus other regions. These aspects included a less experienced workforce, lower staffing levels leading to increased work demands and demands for conducting out of scope jobs, cost cutting, or production over safety. These aspects are both regional and industry norms that no single company or even group of companies is likely to change on their own. These aspects may have a large influence on the level of safety results; however, if a company cannot influence them, another approach should be taken. The other approach would involve improving elements that are under the control of the company and the individuals working and leading the company namely the leadership efforts identified in this study. While none of the suggested recommendations will be without significant effort, the goal of eliminating injuries and fatalities should be enough of a driver to warrant the investment. If

successful and shared, there is always the opportunity to move the industry in the same direction and consequently, improve the workplace safety of thousands of employees.

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Appendix A: Employee/Supervisor Interview Guides

Introduction

Hello _____, thank you for agreeing to participate in this conversation and research project. I am Halina Caravello and as you may know, I am the one of the leads for HS&E at [names company]. I have been with the company for almost 24 years and I started in the R&D lab at [names company]. Most of my career at [names company] has been related to safety, at first product safety and then additionally employee safety. Four years ago, I went back to school to study for my Ph.D. in leadership and organizational change.

So about the project, over the last 5-6 years as I have been studying the data on employee injuries and working to determine how best to move [names company] forward, I have seen a disturbing trend. Employees working in North America and specifically the U.S. are being injured at a greater rate than employees in other regions, even in the Gulf of Mexico. This trend is repeated at our competitors, our customers and in the industry in general. In my school research project, I want to try to find out why with your help. That is why I am here today and hoping that my conversations with you and some of your colleagues will help me figure out the reason and more importantly find some solutions that will keep employees like yourself from being injured.

The method of research I am conducting is called qualitative, that is I am not testing a hypothesis, I am attempting to generate theories based on information that I gain from all the employees that participate in the study. You are going to help identify the theory that may be the start to the solution. Again, I appreciate you agreeing to

participate in this research study, and want to re-emphasize that your participation is voluntary, your information will be kept confidential, none of the information you provide will be associated with your name (I will use code numbers and keep the material at my home office) and I will give you an opportunity to review any conclusion I derive. In order for me to listen to the conversation, I am not going to take many notes, but that means I will have to record the conversation. I will not use anything other than your first name and I will keep the recording confidential in my home office. Only a code number will be used on the note page and I will keep the key to the codes separate and completely confidential. Is that okay with you? Do you have any concerns that we should discuss before we get started? Lastly, as part of a school requirement, I must have formal agreement from you to participate in the study. The consent form describes the study, the information I have just given you. Please review the form and if you are still willing to participate, please sign and date the form.

This part of the conversations should only take an hour of your time.

Employee Form

Participant #: _____ Location: _____

Date:_____ _____ Gender: _____

Time Started: _____ Time Stopped: _____

Employee Introduction: Okay, I told you a bit about myself, let's continue by getting some background on you.

1. How long have you been doing this job?_____
2. How long have you worked for the company? _____
3. How many years experience do you have in the industry? _____
4. Have you ever worked outside of the US? _____ If yes, where _____
5. Tell me briefly about your job:
6. In this position, do you generally work alone, in small groups or as part of a larger team?

Thanks very much for that information; it will be very helpful. Now let's get started with the conversation related to the study. I would like to hear you speak about safety aspects as they relate to your work and interactions with other employee and your supervisor. To help the conversation, I will prompt you with questions, but do not feel constrained by the questions, they are only a guide, and there are no right or wrong answers. What I am trying to do is hear as many answers to see if there are any commonalities or differences that might help to lead me to constructing an underlying theory as to why U.S. employees are being injured at a higher rate. More importantly, determine what we can do to reduce this injury rate and protect employees.

Section A: Employee's Attitudes and Behaviors

First, we will start with your thoughts on your own activities and actions related to safety.

1. In your current job, tell me where you think there is a risk of getting hurt.
2. Tell me why you feel able to do your job safely? Or why you do not feel able to do your job safely?
3. If you have you ever been hurt while working what do you think could have prevented the injury?
    a. If the answer is no, why do you think you have not been hurt while working?
4. Tell me whether you do or do not trust your co-workers to work safely? Why?
5. Why do you think accidents happen?
6. The injury rates for U.S. employees are higher than in other regions, why do you think this is the case?
7. Tell me about the safety related activities that you participate in.
8. If you have ever suggested a change in the way a job should be done in order to be safer, tell me about the experience?
9. Tell me about a time you have worked unsafely. Why?
10. How do you learn about the hazards of your job.
11. If you speak to your supervisor about hazards, tell me about these experiences.
12. What does you supervisor do to help you learn about the hazards?

13. Why do you believe safety holds a priority within your workgroup? Or why safety does not hold a priority within your workgroup?
14. If you have ever had an experience where you felt pressured to break safety rules in order to meet a customer's or your supervisor's deadline, tell me about it.

Section B: Communication

Now, we will turn to another aspect, namely communication.

1. Does your supervisor speak with you about safety related issues in situations such as one on one conversations, safety meetings, or group discussions?
    a. How often do they occur? Or Why do you think they do not occur?
    b. Tell me what you think about these communications.
2. How often do you interact with your supervisor in person?
    a. By telephone or email?
    b. What kinds of safety related items do you discuss during this time?
3. How often does your supervisor visit your worksite?
    a. When was the last time your supervisor visited you while you were at the worksite or on the shop floor?
    b. What did your supervisor discuss while there?
4. Why do you speak with other employees about safety? Or, why do you not speak to other employees about safety?

Section C: Manager's Attitudes and Behaviors

1. How does your supervisor involve employees in HS&E activities and decisions?
2. How does your supervisor ensure the employees are following the safety rules?

   a. Does your supervisor do this consistently?

3. How does your supervisor correct employees that are not following safety rules or working unsafely?
4. How do you decide what priority safety has in your work situation?
5. How does your supervisor indicate the importance of safety training?
6. Why do you think your supervisor feels responsible for your safety?
7. Tell me about any safety equipment you feel you need that you do not have?
   a. If you have requested this equipment from your supervisors, tell me about the interaction.
8. Tell me about some actions your supervisor has taken to set a good example of safe behavior.
9. Why do you think your supervisor believes injuries are preventable? Or why do you not think your supervisor believes injuries are preventable?
10. How are near misses handled by your supervisor?
11. Are near misses always reported? How come?
12. When a problem related to safety occurs, describe how your supervisor is likely to address the problem.

Section D: Leadership Traits

1. Describe the leadership characteristics of your supervisor to me (characteristics can include items such as being people orientated, task oriented, actively involved, not involved, detail oriented, big picture orientated, visionary, etc.)
   a. Which of these traits, if any, motivate you to work safer?

   b. Which do you think are important to keeping employees from being injured?

2. Why do you feel that your supervisor cares about your well being?
3. Tell me about your relationship with your supervisor.
4. Describe the level of trust between you and your supervisor that work can be done safely.
5. How does your supervisor make you feel that it is possible to always work safely?
6. What would you like your supervisor to do differently to ensure employees worked safely?
7. Tell me about a time when you were working safely, did your supervisor compliment you on a good job?
8. If your supervisor set goals that include working safely, how often do you discuss these goals?
9. What safety vision has your supervisor shared with you?
10. How comfortable are you in speaking with your supervisor about safety issues?
    a. Tell me about an experience that you had discussing safety with your supervisor.
11. When you hear a safety message from a senior leader (for example, the president), does it influence you more or less than the safety message from your supervisors? Why?

Section E: Concluding Comments

1. Are there any questions that I did not ask that you think I should have?
2. Are there any questions that you would like to go back and add information?
3. What additional comments would you like to make about safety in U.S. land-based operations?

Thank you very much for participating in this process. You have provided very useful data and I appreciate your time. If I have any clarifying questions or need to follow-up, may I give you a phone call?

Supervisor Form

Participant #: _____ Location: _____

Date:_____ _____ Gender: _____

Time Started: _____ Time Stopped: _____

How many employees supervised: _____

Introduction: Okay, I told you a bit about myself, let's continue by getting some background on you.

1. How long have you been doing this job at?_____
2. How long have you worked for the company? _____
3. How many years experience do you have in the industry? _____
4. Have you ever worked outside of the US? _____ If yes, where _____
5. Tell me briefly about your job:
6. Do your employees generally work alone, in small groups or as part of a larger team?

Thanks very much for that information; it will be very helpful. Now let's get started with the conversation related to the study. I would like to hear you speak about safety aspects as they relate to your work and interactions with other employee and your supervisor. To help the conversation, I will prompt you with questions, but do not feel constrained by the questions, they are only a guide, and there are no right or wrong answers. What I am trying to do is hear as many answers to see if there are any commonalities or differences that might help to lead me to constructing an underlying

theory as to why U.S. employees are being injured at a higher rate. More importantly, determine what we can do to reduce this injury rate and protect employees.

Section A: Employee's Attitudes and Behaviors

First, we will start with your thoughts on your own activities and actions related to safety.

1. Tell me about the types of work you do where you think there is a risk of getting hurt.
2. Tell me why you feel able to do your job safely? Or why you do not feel able to do your job safety?
3. If you have you ever been hurt while working what do you think could have prevented the injury?
    a. If the answer is no, why you think you have not been hurt while working?
4. Tell me what makes you trust or not trust that your employees will work safely?
5. Why do you think accidents happen?
6. The injury rates for U.S. employees are higher than in other regions, why do you think this is the case?
7. Tell me about the safety related activities that you participate in.
8. If you have ever suggested a change in the way a job should be done in order to be safer tell me about the experience?
9. Tell me about a time you have worked unsafely. Why?
10. How do you learn about the hazards of the jobs you are responsible for?
11. How do you help your employees learn about the hazards of their jobs?

12. Tell me what actions you have taken to set a good example for safety.
13. How do you correct employees that are not following safety rules or working unsafely?
14. How do employees know what priority safety has in the workplace?

Section B: Communication

Now, we will turn to another aspect, namely communication.

1. Tell me about your safety related discussions with employees in one on one conversations, in safety meetings, or in group discussions.
    a. How often do they occur? Or Why do you think they do not occur?
2. How often do you interact with your employees in person?
    a. By telephone or email?
    b. What kinds of safety related items do you discuss during this time?
3. Why do you think it is important to speak with employees about safety?
4. Tell me about how easy or difficult it is to talk to your employees about safety.
5. Are you able to provide direct (face to face) supervision to your employees?

Section C: Attitudes and Behaviors

1. How do you involve employees in HS&E activities and decisions?
2. How do you ensure the employees are following the safety rules?
3. How do you indicate the importance of safety training?
4. Do you feel responsible for your employee's safety? Tell me why?
5. Tell me about any safety equipment you feel your employees need that they do not have.

   a. If you have you spoken to your manager about this request, tell me about this interaction.

6. Tell me about some actions you have taken to set a good example of safe behavior.
7. Tell me about a time you felt pressured to break safety rules in order to meet a customer's or your manager's deadline.
8. Tell me how you handle reports of safety related events such as near misses and injuries.
9. When a problem related to safety occurs, describe how you address it?
10. How much time do you get to spend on safety related issues?
    a. If you had more time to spend on safety, what would you do?
11. How do you show your employees that you are committed to safety?
12. How do you know that your employees know how to work safely?
13. Explain to me why you believe you can or cannot control the safety of your employees?
14. What would you do differently to ensure your employees worked safely?

Section D: Leadership Traits

1. Describe your leadership characteristics to me (characteristics can include items such as being people orientated, task oriented, actively involved, not involved, detail oriented, big picture orientated, visionary, etc.)
2. Describe the leadership characteristics of your manager to me .
    a. Which of these traits, if any, motivate you to work safer?

   b. Which do you think are important to keeping employees from being injured?
3. Why do you feel that your manager cares about your well being?
4. Tell me about your relationship with your manager.
5. Describe the level of trust between you and your manager that work will be done safely.
6. Explain to me how your manager makes you feel that it is possible to always work safely?
7. What would you like your manager to do differently to ensure employees worked safely?
8. If your manager set goals that include working safely, how often do you discuss them?
9. What safety vision has your manager shared with you?
10. Describe how your manager reacts to good safety behavior or activities?
11. How comfortable are you speaking to your manager about safety issues?
    a. Tell me about an experience that you had discussing safety with your supervisor.

Section E: Supervisor – Manager Influence.

1. Tell me about the priority your manager sets for safety?
    a. Is this priority clear and consistent to you or does it change frequently?
2. How does your manager show you he/she is committed to safety?
3. Does your manager visit your worksite?

   a. When was the last time your manager visited you while you were at the worksite or on the shop floor?
   b. What did your manager discuss while there?
4. What does your manager do to help you learn about the hazards?
5. How are reports of near misses and injuries handled by your manager?
6. Do you believe all near misses are reported? Why?
7. Why do you think your manager believes injuries are preventable?

Section F: Concluding Comments

1. Are there any questions that I did not ask that you think I should have?
2. Are there any questions that you would like to go back and add information?
3. What additional comments would you like to make about safety in the U.S. land-based operations?

Thank you very much for participating in this process. You have provided very useful data and I appreciate your time. If I have any clarifying questions or need to follow-up, may I give you a phone call?

Appendix B: Research Project Audit Trail

This Audit Trail provides the overall steps taken to organize and conduct the research project.

Preliminary Activities

- **A.** I obtained approval from the sponsoring organization to conduct research and invite employees to volunteer to participate in the project.
- **B.** I informed the U.S. land leadership team of the project intent and design and obtained support to conduct the research involving employees in U.S. land operations. Through these interactions with the leadership team, I amended the study design by not sending written (general) information about the study to managers in their organization.
- **C.** I obtained a list of employees (Excel spreadsheet) working in U.S. land operations from the HR department.
- **D.** The HR list was delimited to employees and first-line supervisors using job titles as a first cut and the company employee organizational chart tool to ensure selected list of employees met the participant criteria.

Participant Invitations and Selection

- **A.** I sorted the HR list by job title and then by geographic area and selected employees at random aiming for a spread of product lines and geographies. A sub list of 100 potential participants was created is a new Excel worksheet. The actual study participants self-selected by agreeing to volunteer for the research project; thus the ultimate spread of product lines and geographies was not determined by me.
- **B.** The first batch of invitation letters was sent on June 14, 2010 with a response date of June 28, 2010. I sent an email with an electronic version of the invitation letter at the same time. All positive and negative response forms were maintained in the project records by me. Not all response forms were returned.
- **C.** I sent a second batch of invitation letters (and emails) to the invitees that did not return a response form from the original invitation (38 employees and 33 supervisors). This follow-up invitation was dated July 1, 2010 and had a response date of July 15, 2010.
- **D.** To achieve the minimum sample size of 10 employees and 10 supervisors, additional participants were needed. I selected a second batch of potential participants from the original HR employee list inclusive of 50 employees and 20 managers. A smaller number of supervisor participants were selected because

only one additional supervisor was needed to meet the minimum number of supervisor participants. The reduced number of invitations aided in limiting costs.

E. I sent invitation letters (and email requests) to the second batch of potential participants on August 19, 2010 with a response date of August 28, 2010.

Interviews

A. I contacted each of the employees and supervisors responding positively to the invitation by telephone to set up an appropriate interview appointment. Due to the broad geographic distribution of the volunteers, their field schedules, and the inability to group interviews in broad locations, telephone interviews were conducted with 24 of the 27 participants.

B. Study volunteers were designated by the letter E for employees and a number (order of interviews) and an S for supervisors and a number. I created the key to the participant list and did not provided to anyone else to maintain confidentiality.

C. The following table includes a list of participants, interview dates, product line represented, and location of participant.

Participant	Interview Date/Location	Product Line	State
S-1	6/29/10 – Texas, office	Drilling	Texas
S-2	7/2/10 – Teleconference	Pumps	Wyoming
S-3	7/2/10 – Teleconference	Wireline	Wyoming
S-4	7/13/10 – Teleconference	Wireline	Texas
S-5	7/20/10 – Teleconference	Oil Tools	Wyoming
S-6	7/22/10 – Teleconference	Oil Tools	Louisiana
S-7	7/23/10 – Teleconference	Oil Tools	Louisiana
S-8	8/9/10 – Teleconference	Drilling Fluids	Louisiana
S-9	8/18/10 – Teleconference	Drill Bits	Colorado
S-10	8/17/10 – Teleconference	Oil Tools	Pennsylvania
S-11	8/18/10 – Teleconference	Wireline	Texas
S-12	8/20/10 – Texas, office	Drilling Fluids	Louisiana
E-1	7/13/10 – Teleconference	Chemicals	Texas
E-2	7/16/10 – Teleconference	Chemicals	Texas
E-3	7/22/10 - Teleconference	Pumps	Oklahoma
E-4	7/23/10 – Teleconference	Pumps	Texas
E-5	7/26/10 – Texas, office	Drilling	Texas
E-6	8/6/10 – Teleconference	Wireline	Illinois
E-7	8/12/10 – Teleconference	Drilling	Oklahoma
E-8	8/13/10 – Teleconference	Oil Tools	California
E-9	8/18/10 – Teleconference	Chemicals	Mississippi

E-10	8/20/10 – Teleconference	Wireline	California
E-11	8/21/10 – Teleconference	Drilling	Oklahoma
E-12	8/26/10 – Teleconference	Wireline	Colorado
E-13	8/30/10 – Teleconference	Wireline	Illinois
E-14	8/30/10 – Teleconference	Drilling	California
E-15*	9/29/10 – Teleconference 10/4/10 - Teleconference	Oil Tools	West Virginia

***** Employee terminated the interview due to work situation and re-established interview on 10/4.

D. I used a structured interview questionnaire that was specific to employees or supervisors. I digitally recorded the interviews and took minor notes during the interview, but the focus was maintained on the conversation with the participant.

E. I developed interview notes at the conclusion of the interviews that included general thoughts about the interview, any improvements in the interview technique, any new lines of questioning resulting from comments provided by the participant, and any thoughts related to potential categories or themes for me to address at a later time.

F. Each digital recording of the interview was transferred to a voice file on a portable drive and transcribed by me or by a third party shortly after the interview. No confidential information contact information was included in any of the voice files.

G. I reviewed each transcript against the voice file for accuracy.

Data Analysis

H. I initiated data analysis once the first transcript was available. The entire transcript was read to obtain a sense of the information. During the second read through, I began writing codes in the margins of the transcript as a mechanism for identifying initial codes. I listed these codes in the research journal and added a few potential codes that could be expected in future transcripts based on the responses from the first participant. All transcripts were entered into the NVivo 8 software as internal documents.

I. The initial list of codes was entered into the Tree Node option of the NVivo 8 software. The list of codes evolved as the coding process progressed. The first transcript was then re-reviewed in the NVivo 8 software using the coding function. Any new codes emerging from the transcript analysis were added or clarified. A majority of the codes had subcodes to aid me in organizing the concepts. For example, the code “Customers drive safety” had subcodes of

"Mandates for good safety", "Pushing for productivity over safety", and "Safety over production".

J. I coded each additional transcript only in the software program with new codes added to the Tree Nodes when identified. If a new code was indentified, I recoded previous transcripts to ensure an appropriate reflection of the data.

K. As the coding process continued, I began to create memos related to the coding process, any thoughts of emerging themes or questions to check through further coding or analysis. Reflective memos were also written where I asked questions of the data, or captured emerging thoughts regarding the process. Some of the questions and at least one model was hand written in my journal, as the computer was not always available. These were later entered into the software.

L. Once all the transcripts were coded, I reviewed all the codes and their content to ensure that data were not missed or misplaced. Reading through the codes also allowed me to combine subcodes that were similar, move subcodes to more appropriate overarching codes, and eliminate codes that did not develop. I also used this review as a method to highlight negative/opposite cases in the codes to help sensitize me to these events during the theoretical abstraction process.

M. I prepared summary memos for each of the codes identified in Appendix C and conducted axial coding, organizing codes around central categories, recoding specific question responses (e.g., views of employees and supervisors in leadership traits that motivate safety), and combining codes to reassemble data in a different perspective. I continued this exercise until further organization and movement of the data did not reveal any new insights.

N. I next assembled the summary memos (and associated coding) in a format to answer the research questions directly. I drew several diagrams and preliminary models to help represent a visual depiction of the data. Selective coding was used to clarify core themes.

O. I then wrote theoretical memos organizing the summary memos and further developing the core themes answering the research questions.

P. Based upon the picture of existing leadership that emerged from the data, I attempted to analyze company safety statistics to determine whether any additional relationships would develop. This attempt was not successful as the company data could not be provided at a detailed level to allow this comparison.

Data Interpretation

A. Using the analysis of the data provided by the study participants and using the theoretical memos as guiding documents, I identified major themes responsive to the research questions. Chapter 4 includes the responses to the research

questions, which are supported by in vivo codes taken from the participants' transcripts.

B. Based on the collective and supported themes emerging from the data and the analysis, I developed a theory of the influence of leadership in the U.S. land operations related to the observed elevated incident rates in this region.

Data Validation

A. I spent extensive time interviewing the 27 participants in the study and learning from their experience in U.S. land operations. A rapport was built with each of the participants to help ensure an open conversation between the person being interviewed and me.

B. Throughout the coding process, I re-examined transcripts when new codes or questions emerged to ensure no data were missed.

C. A copy of the interview transcripts was offered to the study participants, but none requested a copy.

D. I provided a copy of the study findings and interpretations to each of the participants save one that was no longer with the company. At the end of each interview, I let the participant know that they would have an opportunity to validate (i.e., identify interpretations that were significantly inconsistent with their beliefs) the interpretations.

E. I also provided a copy of the study findings and interpretations to peer subject matter experts to provide another check of the findings.

F. I kept a journal to capture thoughts, questions, and plans throughout the process. The journal and memos were also used to ensure potential biases were made conscious, explored, and mitigated when necessary.

Appendix C: List of Initial Codes for Analysis in Alphabetical Order

Code Titles	Definition of Code	Example of Coded Material
Achieving trust in employees or co-workers	Development of trust between employees, supervisors, and managers	"I think just their attitude, just getting to know them and seeing the way that they conduct themselves around the shop, the way they watch out for other people, like I said most of them when they get hired on they start out in the shop and you can see their interactions with other people and you can just tell when someone is watching out for someone else and paying attention to what is going on" (S-10)
Communication with employees	Discussing safety at work in general or at specific event.	"Well I speak to other employees about safety because when we are on the job site I am responsible for their safety" (E-10)
Customers driving safety	Reflections by participants on the role clients play in driving safety	"We know that our customers look at our work, our safety record, we've been told that they look at this, we've almost lost customers because of safety record at times, and so that plays a big part in our safety stuff" (E-4)
Employee safety participation	Examples given by employee participants of their safety participation	"A job safety sheet, and we'll go through a list we'll check off any hazards that I don't see or if a company guy's there I'll have him sign off and myself and operators sign off, and who… there's a rig crew on that site and they'll sign off" (E-6)
Employees working safely	Participants describing how and why they work safely	"There's procedures in place for everyone's needs, (you know) everybody has procedures for every, every activity you do. People knew certain spots to stand, (you know) certain people were allowed there, certain people had to be away, so they had plenty policies in place" (E-5)
Employees working unsafely	Participants previously injured explaining why	"I was carrying too much stuff…" (E-11)
Ensuring rule following	Comments to supervisors ensuring employees follow safety rules	"Well, if they see them in the shop that is the biggest way, the supervisor would say something to the employees" (E-12)

Hazard Awareness	Participants describing the types of hazards that can cause injuries	"It's a cooperative between the rig crew and myself so they point stuff out to us and we point stuff out to them" (E-12)
Injuries are preventable	Participant perceptions about preventing all injuries	"I know that we as a company and everything we go like we can be accident free and I really believe that it is possible" (S-3)
Leaders' interactions with employees	Supervisor participants' descriptions of their manager's interactions with employees	"Well, but not frequently enough" (S-12)
Leader's traits	Supervisor participants' descriptions of their manager's leadership traits	"Think he is a generally, generally concerned individual, he is probably just like me, he doesn't want anybody to get hurt" (S-10)
Leaders' traits described as motivating	Leadership traits described as motivating to safety by supervisors	"I think communication is probably the most important leadership trait" (S-10)
Leaders' traits described as not motivating	Managers' leadership traits described as not motivating to safety	"No he wasn't people orientated" (S-6)
Not getting hurt	How participants keep themselves from getting hurt	"So the best thing to do is to assess the situation and if you cannot come up with something that you feel is the absolute safest way to do it then to open your mouth and ask for help" (S-4)
Participants suggesting safety improvements	Specific changes participants have made to enhance safety performance	"I don't think I ever have, nothing that comes to mind" (E-1)
Policies influencing safety	Company policies cited by the participants	"But, since they have done the driving policy where employees can't drive between 11 and 5, that has helped that" (S-1)

Risk of getting hurt	Specific ways participants believed they could get hurt on the job	"Hoisting operations, to me it is probably one of the most unsafe jobs we have" (S-4)
Safety goals	Conversations about safety goals between employees and supervisors and supervisors and managers	"Like I said, right now the safety goal is the stop cards. Every person has to have 4-5 stop cards every week. No ifs ands or buts"(E-12)
Safety is or is not a priority	Participants beliefs about safety priority	"I think it is (priority) because nobody wants to get hurt, everybody wants to go home safely" (E-1)
Safety vision	Discussions about safety visions between employees and supervisors and supervisors and managers	"I mean basically I goes (you know) having zero recordable incidents our motor vehicle incident rate at a certain limit, probably those things stick out most" (S-7)
Sending mixed messages	Supervisors or managers only vocally supporting safety	"I think that he talks that they are preventable, but he never backs up the talks, just go get the job done" (E-10)
Senior leader influence of safety message	Employee views on the importance of senior leader safety messages	"I think honestly I would say less" (E-1)
Suggestions for improvement	Participants safety improvement suggestions to the researcher	"I really would like to see us as an industry or even just as a company to kind of like sit one time and say exactly what is safety and to go back to the drawing board and start all over, it's not working" (S-3)
Supervisor responsible for employee safety	Participants' views on the supervisor's responsibility for safety	"Yes, because my immediate supervisor he always.. when I finish a job, hey your guys have enough hours to drive, questions like that" (E-12)
Supervisors' leadership traits	Employee and supervisor participants' views on supervisors' leadership traits	"By how they did, by example, they would always work safely and (you know) there was never a reason why we needed to not work safely" (E-5)

Supervisors' motivating leadership traits	Employee participant views on motivating leadership traits	"I think, I think it's the fact that he talks to employees, and consciously stresses that he really cares about their safety, so it's mainly the communication with his employees, the open communication" (S-11)
Supervisors do differently	Employee or supervisor participants comments about change	"Might compliment, might say it more often, he recognize you that you were working safely" (E-13)
Supervisors' examples for safety	Participants descriptions of safety examples	"Whenever I actually do physical work I try to do it in a manner that they can see that I'm taking action not to allow myself some way that I'm going to get hurt, so by example" (S-6)
Supervisors' safety activities and interactions	Participants descriptions of supervisors' safety interactions	"I usually bring it up to them at least once a month and when people are falling behind I am not opposed to sending them emails or calling them and generally just nagging them, to make sure they take them, they are aware that I know what is going on" (S-10)
Time spent on safety	Thoughts related to the amount of time spent on safety by supervisors	"I don't know of anything more that I could do" (S-12)
US rate is higher	Participants views on why the U.S. rate is higher	"I think we've got some challenges with some inexperienced crews and stuff" (E-11)
Why accidents happen	Participants views on why accidents happen	"Probably, both equipment and employee fatigue" (S-10)
Why employees get hurt	Participants views on why employees get injured	"Both cases were probably human error" (S-3)
Workload pressures	Participants' views on the influence of workload and safety	"I can't think of…. there's been several small things but nothing major, nothing that would have endangered anyone's life" (S-4)

Appendix D: Sample Coding

A. Sample selective coding of all employee comments related to supervisors' leadership traits. Taken from a Free Node in NVivo 8 software.

46. Describe the leadership characteristics of your supervisor to me.

<Internals\E-1> - § 2 references coded [1.82% Coverage]

Reference 1 - 0.90% Coverage

I think he is a big picture person

Does he share this picture with you and the other employees?

Not always.

Does his big picture include safety and a vision about safety?

If it does I am not aware.

<Internals\E-10> - § 1 reference coded [2.82% Coverage]

Reference 1 - 2.82% Coverage

This is all confidential. To be honest, our supervisor has no skills, no people skills, no management skills, no timeframe skills.

So he really is not a leader?

No he is not at all, and it's sad to see because our district manager is leaving, he is being promoted, and this is going to leave this guy in charge until we get somebody else, or maybe he will be our new district manager. There will be a lot of people unhappy with their jobs.

So do you think the level of safety will go down when your district manager leaves?

I am sure it will.

<Internals\E-11> - § 1 reference coded [1.32% Coverage]

Reference 1 - 1.32% Coverage

No I don't know my supervisor well enough to say, actually they just switched my supervisor I don't know my new supervisor at all, and I have never met him. This is just a month ago, but the prior one supervisor for a year and one-half, I really don't know him

well. I met him a couple of times in the office and spoke on the phone, but I really don't know him well and can't say what kind of leadership traits he has.

<Internals\E-12> - § 1 reference coded [0.82% Coverage]

Reference 1 - 0.82% Coverage

Well, my immediate supervisor is really good, very hands on, very people oriented. But there is other management in my shop that is not that way.

<Internals\E-13> - § 1 reference coded [1.84% Coverage]

Reference 1 - 1.84% Coverage

As far as safety, leadership, well he is more detailed and he is a probably combination of both (people), not really strong in either suit, people oriented leadership. As far as the task at hand, it would be asking you to do it, as far as him kinda showing you how to doing, he is probably a little low, but as far as people, he is a good delegator.

He is highly intelligent in that respect.

B. Sample coding from Tree Node: Leader's Traits/Caring for employee's well being

50. Why do you feel that your manager cares about your well being?

<Internals\S_3> - § 1 reference coded [0.06% Coverage]

Reference 1 - 0.06% Coverage

You mean does he care personally for me? **YES** No I don't think that.

<Internals\S_4> - § 1 reference coded [0.38% Coverage]

Reference 1 - 0.38% Coverage

I'd hate to think he didn't.

<Internals\S-1> - § 1 reference coded [1.00% Coverage]

Reference 1 - 1.00% Coverage

I can just tell by his actions, I guess, he …if there is a problem he will figure a way, we will get to the bottom of it we always get it solved, if there is a disagreement we figure a way around it, he is always been good about working with me to get the problem solved, something does not sit there and fester for a long

time. We get the answer, we get it done.

<Internals\S-10> - § 1 reference coded [0.71% Coverage]

Reference 1 - 0.71% Coverage

I think he is a generally, generally concerned individual, he is probably just like me, he doesn't want anybody to get hurt, just like me he doesn't want to get hurt because of something he did or did not do.'

<Internals\S-11> - § 1 reference coded [0.36% Coverage]

Reference 1 - 0.36% Coverage

I mean I think he cares about us, but it is hard to draw an example of why he would think that.

<Internals\S-12> - § 1 reference coded [0.12% Coverage]

Reference 1 - 0.12% Coverage

I don't how to answer that one.

<Internals\S-2> - § 1 reference coded [0.39% Coverage]

Reference 1 - 0.39% Coverage

Definitely, he just that type of a person. He don't care just about you he takes time to ask about your family.

<Internals\S-7> - § 1 reference coded [0.83% Coverage]

Reference 1 - 0.83% Coverage

Probably the same because we have the same type of discussions and it's not everything's not 100% just [names company], it's what's going on outside of our work because I mean we spend more time with each other here then we do with our families at home so it's kind of, if you don't have that kind of relationship it's kind of hard to be in a place that you're not happy with that you spend 75% of your time

<Internals\S-9> - § 1 reference coded [0.40% Coverage]

Reference 1 - 0.40% Coverage

He knows me and he knows my family and he wants to see everybody get home safe.

Curriculum Vitae

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Education

Ph.D. in Applied Management and Decision Sciences
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M.Sc. in Biology
University of Houston, December 1985

B.Sc. in Biology with a Specialization in Marine Biology
Fairleigh Dickinson University, May 1983

Professional Experience

2004 – Current: Vice President, HS&E, Energy Service Company

1990 – 2004: Director, HS&E, Energy Service Company

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