

PERCEPTIONS OF RESPONSIBILITY FOR WORKPLACE
SAFETY IN A MANUFACTURING
ENVIRONMENT

By

ROBERT A. HOWARD

Bachelor of Liberal Arts
University of Oklahoma
Norman, Oklahoma
1992

Master of Human Relations
University of Oklahoma
Norman, Oklahoma
1993

Submitted to the Faculty of
the Graduate College of
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
May, 2004

COPYRIGHT

By

Robert A. Howard

May, 2004

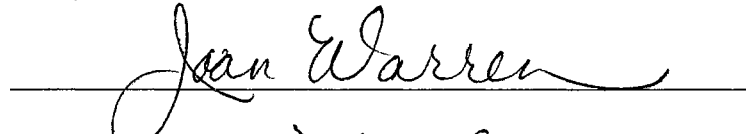
PERCEPTIONS OF RESPONSIBILITY FOR WORKPLACE
SAFETY IN A MANUFACTURING
ENVIRONMENT

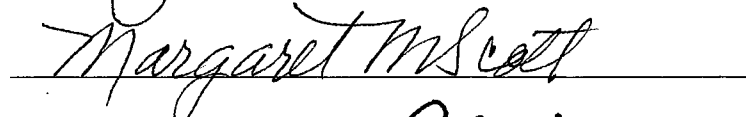
Thesis Approval



Thesis Advisor









Dean of the Graduate College

ACKNOWLEDGMENTS

I wish to sincerely thank my committee – Dr. William Venable, Chairperson, Dr. Deke Johnson, Dissertation chairperson, Dr. Joan Warren, and Dr. Margaret Scott—for guidance and support in the completion of this research. I deeply appreciate the time, resources, and effort that they have invested in me. I am especially grateful to Dr. Deke Johnson for his consistent, insistent, and persistent encouragement. I would not have been able to complete this dissertation without his refusal to give up on me. A special thanks also to Dr. Clyde Knight, Dr. Connie Wilson, and Dr. Gary Conti for their help and encouragement.

I also wish to gratefully acknowledge my Mother (deceased) —for her guidance and support throughout my life. I am especially grateful for the faith and the love that she instilled in me and for the encouragement and example she provided. To so many others that helped guide and encourage me along the way for these people I am grateful.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Background of the Problem	2
Statement of the Problem	6
Purpose of the Study	7
Research Questions	8
Assumptions	9
Survey	10
Scope of the Survey	11
Limitations of the Survey	12
Definitions of Terms	13
Summary	15
II. REVIEW OF THE LITERATURE.....	17
Introduction.....	17
Organizational Climate	28
Attitudes and Reports of Behavior.....	43
Change Theory.....	54
Summary	58
III. METHODS AND PROCEDURES.....	60
Introduction.....	60
Survey Questionnaire.....	62
Survey Population and Sampling Strategy.....	63
Data Validity	66
Data Collection Procedure	66
Data Collection for Survey Process	68
Replication	68
Data Analysis	69

Chapter	Page
IV. FINDINGS	70
Findings of the Survey	74
Findings of the Respondents	81
Employer’s Responsibility for Safety	85
Employee’s Responsibility for Safety.....	94
Strategic Planning and Change Management	99
Training and Safety	104
Perceptions of Supervisory Emphasis.....	108
Summary of Findings.....	109
V. OVERVIEW, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	112
Overview of the Survey	112
Summary of the Survey.....	113
Effects of Organizational Factors on Safety Perceptions.....	116
Implications of the Survey	121
Recommendations for Future Research	122
BIBLIOGRAPHY	125
APPENDIXES.....	130
APPENDIX A – INTERVIEW AND QUESTION INFORMATION	130
APPENDIX B – JOB SATISFACTION RESULTS	171
APPENDIX C – DEMOGRAPHICS.....	193
APPENDIX D – INSTITUTIONAL REVIEW BOARD APPROVAL.....	196

LIST OF TABLES

Table	Page
1. Sample Population and Participant Percentages.....	65

CHAPTER I

Introduction

Perceptions of Responsibility for Workplace Safety In a Manufacturing Environment

The issue of responsibility for workplace safety has been contentious, with the respective roles of management and employees often poorly defined. While ultimate responsibility for workplace safety rests with management, the objective of improvements in workplace safety through hazard identification and mitigation cannot be achieved without the full cooperation of workers at every level of an organization. Despite the need for cooperation between management and employees with respect to workplace safety, many organizations have not developed operational protocols that clearly designate the respective responsibilities of employees at all levels towards safety issues. To a large degree, this is the outcome of varying perspectives among employees with regard to responsibility for workplace safety, with management assuming that safety requires the full cooperation of all employees and assuming that workplace safety is the sole responsibility of management. In the absence of clearly defined roles regarding responsibilities for workplace safety, safety concerns can have a negative impact on job satisfaction.

Although this issue of perceived responsibility for workplace safety has a high degree of importance for businesses of all types, there has been no focused research on

the potential connection between perceived responsibility for safety, job satisfaction and the level of supervision emphasis. While there have been extensive studies of the separate factors that influence job satisfaction such as the level of objective workplace safety and the level of supervisory emphasis, these studies do not attempt to establish a correlation between these factors and the perceptions of responsibility for workplace safety. This survey is intended to determine if there are differences in the perceptions of responsibility for workplace safety, and to identify modifying factors such as training or experience levels that can modify these perceptions.

Background of the Problem

The experience of workplace safety is not well understood despite the apparent connection between perceptions of workplace risk and job satisfaction, performance, and costs of business operation (McLain, 1995, p. 1727). The perceptions of health and safety risks are associated with complex interpretations that vary among individuals based on the individual's prior experience, knowledge of safety issues, and position in the organizational hierarchy. This suggests that there is a distinct difference between objective safety risk in the workplace and the perception of the nature and magnitude of the risk. As a result, the cognitive interpretation of a workplace risk is dependent on a large number of personal factors that may be unrelated to objective risk.

Investigations into the impact of perceptions of workplace safety on the individual have largely examined the relationship between objective risk and the individual. From this perspective, objective risk is the combination of the probability and magnitude of the

occurrence of an adverse event. Workplace safety involves the identification of potential hazards and the development of an appropriate method to reduce the likelihood of occurrence of the adverse event, which is generally referred to as risk mitigation. High levels of objective risk tend to have a negative impact on job satisfaction, and tend to raise costs for the organization as the result of higher rates of injury (Vinokaur-Kaplan, Jayaratne & Chess, 1994, p. 98; Hayes et al, 1998, p. 152).

The mitigation of an objective risk, however, does not necessarily lead to the reduction in the perception of risk among individuals in the workplace. To a large degree, the perception of risk is linked to the perception of the relative roles of the members of an organization with respect to workplace safety. Management, which is often distant from actual operations, is largely concerned with the mitigation of objective risk due to its somewhat quantifiable nature. Employees that are more closely involved with line operations, however, often have different perceptions of the nature and magnitude of risks that is based on both an objective and assessment of the risk level. As a result, a situation often develops in which management believes that appropriate measures have been taken to improve workplace safety while employees continue to perceive that the existence of safety issues undermine job satisfaction.

Management has the ultimate responsibility for insuring workplace safety. The Occupational Safety and Health Act of 1970, which created the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA), which operates as a safety oversight and regulatory body, establish the responsibilities of the employer for insuring workplace safety (National Safety Council, 1991, 26). Under the ACT, OSHA has the authority to promulgate,

modify, or revoke safety and health standards in the workplace and to conduct inspections and investigations of safety issues. In practice, OSHA establishes an occupational safety and health framework of standards for organizations in all types of businesses, with authority to enforce compliance with the standards. From the perspective of OSHA, final responsibility for workplace safety rests with the employer, and is based on the assumption that it is possible to identify and mitigate objective risks. In addition, a key component of the OSHA approach to workplace safety is training and education for both management and employees, which is based on the assumption that the employee shares some degree of joint responsibility for the identification and mitigation of workplace hazards. In this framework, each of the firm's employees is minimally responsible for their own safety. Supervisors and managers are not only responsible for their personal safety, but also for the safety of the subordinates reporting to them in this hierarchical chain of responsibility for workplace safety.

Although the hierarchical approach to responsibility for workplace safety appears straightforward, in practice there are barriers to the clear identification of areas of responsibility in the organization. These barriers are generally the result of human factors within an organization such as poor communications, the lack of a structured policy towards risk identification and mitigation, and the differences in perceptions of safety issues between operational employees and management. In addition, in organizations that continue to use a hierarchical organizational structure rather than a matrix or other type of structure, there is a greater degree of perceptual distance and difference between management and line employees. As a result, there is a strong potential for the

individuals within an organization to have varying perceptions regarding responsibility for workplace safety.

The barriers to creating a unified perception of respective responsibilities for workplace safety are increased by the social position of the employees in the organizational structure. Although employees are responsible for their own safety, they nonetheless must depend on others to create a generally safe work environment. In this context, a line employee in a non-supervisory capacity generally lacks the authority to issue or enforce safety measures because they lack the authority to instruct or admonish other similarly situated employees who engage in unsafe practices. While there are exceptions to this such as the case of senior and well-respected employees instructing new comers, the majority of employees have to report such situations to management for corrective action. This can result in negative social consequences for the reporting employee, which fosters the development of an attitude that management alone is responsible for identifying and mitigating hazards.

To a large degree, perceptions of responsibility towards workplace safety are the result of the attitudes and beliefs of the individual. In the theoretical constructs that have developed regarding behavior, the actions of the individual are the result of attitudes and beliefs that have been formed as the result of the experience and education that provide the information on which the attitudes and beliefs are based. As a result, it is theoretically possible to modify attitudes through interventions such as training that provides additional information to the individual (Neal & Griffin, 2002, p.70). Modification of the attitudes and beliefs in turn produces a change in behavior. The main assumption in this model is that there is a difference in perception of workplace safety due to a lack of

understanding of the respective roles for safety responsibility in an organization, which can be altered through a training protocol that directly addresses the issue. In effect, it is theoretically possible for perceptions regarding responsibility for workplace safety to be altered through training. This generally reflects the position of OSHA with regard to safety training, with the organization assuming that increased training levels will lead to increased safety.

Statement of the Problem

Organizations that have differences in the perception of responsibility for workplace safety among employees at various levels are likely to have less effective safety programs and higher injury rates. Because of the nature of perceptions that are based on the attitudes and beliefs of the individual, examining the nature and impact of perceptions regarding workplace safety requires the assessment of a large number of interrelated factors that are difficult to effectively quantify. While clear organizational policies and procedures as well as external oversight bodies such as OSHA can help to establish a framework for the assignment of responsibilities for workplace safety, there remains a strong likelihood that this framework will be moderated by the various personal factors that affect the attitudes and beliefs of individual workers. When the respective responsibilities for workplace safety are unclear or poorly defined, the negative impact on job satisfaction is likely to be greater than in situations where responsibilities are clear and well defined.

In general, the dichotomist relationship appears to exist with managers and their perceptions of workplace safety who have overall responsibility for workplace safety and the employees who accomplish the work. Managers tend to rely heavily on objective

assessments of risk and establish mitigation procedures that attempt to reduce the risk to acceptable levels. In contrast, employees tend to be more component in their perception of risk that is based on attitudes and beliefs that may be different from those of management. This difference is due to the closer proximity of the employee to the hazard, with the employee more likely to sustain an injury from a workplace hazard than the manager. The difference in perception of management and employees regarding responsibility for mitigating the hazard, however, is based on a number of internal organizational factors such as the degree of authority granted to the employee to identify and mitigate risk, the level of supervisory involvement of employee operations, and the amount of training that the employee has received with respect to workplace safety.

The outcome of differences in perceptions regarding the responsibility for workplace safety tends to create an adversarial relationship which may exist in the case of management and employees with respect to safety. Such an adversarial relationship inhibits the creation of effective workplace safety programs that benefit the organization. As a result, a difference in perceptions of safety responsibilities can produce a higher rate of injury to workers, raise costs for the organization, and reduce productivity.

Purpose of the Survey

The purpose of this survey was to assess the perceptions of employees regarding their role and responsibilities for workplace safety. In addition, it determined if job satisfaction, safety knowledge, supervisory perception and emphasis, training interventions and demographics play a role in the development of attitudes towards

responsibility for workplace safety. The significance of the research rests in providing information for developing improved strategies for approaching the issue of workplace safety through interventions that could potentially alter perceptions of responsibility.

Research Questions

This survey was specifically designed to answer the following research questions:

1. Do perceptions regarding workplace safety affect the level of job satisfaction?
2. Does the level of management supervision of employees operate as a modifier for employee perceptions regarding responsibility for workplace safety?
3. Does the level of knowledge regarding workplace safety operate as a modifier for perceptions regarding responsibility for workplace safety?
4. Do demographic factors operate as a modifier for employee perceptions regarding responsibility for workplace safety?
5. Are there differences in the perceptions of management and employees with respect to responsibility for workplace safety in a manufacturing environment?

The survey proceeded from the perspective of the alternative that there are differences in the perceptions of responsibility between managers and employees. It further adopted the perspective that various factors such as the level of training and knowledge and the level of management supervision influence the attitudes and beliefs of employees, which have an effect on perceptions of responsibility for workplace safety. Thus, the principle thesis of the survey is that there are differences in the perceptions of responsibility for workplace safety between management and employees, and that the

nature and magnitude of the differences is contingent on modifying factors such as level of supervisory involvement, training, knowledge, and demographic factors. The speculative theoretical position behind the survey is that a higher level of training and knowledge and a lower level of supervisory involvement produce a greater assumption of responsibility for workplace safety among employees. The findings of the survey are intended to either support or refute that there are differences in perceptions of responsibility for workplace safety and that various factors modify this perception. Additionally, the survey explored the behaviors related to workplace safety in order to formulate improvements in assigning responsibility for workplace safety and to review change theory to determine if it impacts safety in the workplace.

Assumptions

The following assumptions were made regarding the survey:

1. Statements of behavioral intention and self-reports of past behavior were assumed to be a proxy for actual behavior. No direct measurements of behavior were made.
2. Workers and management have similar desires to establish a safe work environment despite job classification or location within an organization.
3. Actual behaviors are the product of attitudes and beliefs, which can be modified as the result of experience or training
4. The XYZ Company represents a typical manufacturing environment

Survey

The survey methodology was suited for the evaluation of complex human interactions in work environment, and was based on the premise that human behaviors were the result of multiple objective and factors. In the specific case of the XYZ Company examined by this survey, the initial research question of whether there was a difference in perceptions of responsibility for workplace safety between management and employees provided the basis for more detailed examination of the factors that potentially caused the differences. The survey of the firm was supported by the use of the survey questionnaire, which gathered specific data that could be quantified. The use of such data gathering instruments has been commonly used by researchers in the context of the survey approach to investigations of complex behavioral matters.

The survey approach enabled research into various factors that explain the variability in perceptions regarding workplace safety in a specific manufacturing plant, with the probability that the findings can be extended to other similarly situated businesses. The approach was intended to identify and provide explanations for behaviors that were produced by a combination of, normative and demographic factors, which were based on the model selected to investigate industrial safety behaviors. The survey approach also provided a basis for evaluating the effectiveness of changes that may be identified as a result of the survey, with the survey findings serving as a baseline for perceptions and behaviors that exist prior to the implementation of a corrective action on the part of a firm.

Scope of the Survey

The survey examined the perceptions toward responsibility for workplace safety in a single manufacturing firm. The scope of the survey was limited to identifying these perceptions, and eliciting information on selected variables such as job satisfaction, level of knowledge of safety matters and demographics that could operate as potential modifiers for perceptions of responsibility for safety. This raises the possibility that the manufacturing facility was not representative of other manufacturing facilities, and that there may have been factors other than those selected for investigation that can operate as modifiers for perceptions regarding responsibility for workplace safety. In addition, the management style and general policies of safety in the firm under investigation may have operated as a factor in fostering specific perceptions of responsibility for workplace safety. As a result, the survey was delimited by the parameters of the management policies and procedures of the firm, which were not investigated as a potential causative factor in the formation of employee and managerial perceptions. The scope of the survey was limited to the identification of potential causative factors for the differences between management and employee perceptions of workplace safety, with establishing definitive statistical correlations between the causative factors and perceptions deemed beyond the scope of the survey.

Limitations of the Survey

The survey conclusions were limited by the amount of information and data discovered in the materials comprising the literature review and the data collected from administration of survey questionnaires. The perspectives of previous researchers, the data collected and the methods employed in research influenced the development of the research questions investigated in this survey. The survey questionnaire was limited in the type of data that it elicits from respondents. In addition, the wording of the questions created a degree of researcher bias by establishing a pre-defined framework that influenced the respondents' perception of the issue being queried. Similar structural limitations inhibit the validation of findings of any survey or research project, however, regardless of the method used to collect data.

One of the principle limitations of the survey was the relatively small size of the sample and its limited geographic scope. The 82 respondents generated small sub-populations that were used in the assessment of the impact of demographic variables on attitudes and perceptions of the total population. As a result, the data generated by this survey was subject to future modification from studies based on larger samplings. In addition, the limited geographic nature of the survey suggested that the findings may have been based on local perceptions of the safety environment in the Oklahoma area and may not have reflected attitudes on a national scale.

The survey was further limited by the potential for selection bias and researcher bias. The percentage of respondents at 65% of the distributed questionnaires was in the median range of acceptable response rates and indicated that self-selection bias may have

been a factor in the survey, reducing the reliability of the findings. In addition, the use of the interview methodology to elicit supplementary information raised the possibility that the researcher interacted with the participants in a manner that would bias responses. Some degree of researcher bias may also be present in the selection of variables and the development of the terminology used in the questionnaire. Researcher bias may also have been present in the selection of the general organizational data that forms the survey.

Definition of Terms

For the purposes of this survey, these terms have the following meaning based on generally accepted definitions of the terminology of XYZ Company and the researchers experience and knowledge as a safety manager:

Accountability – An active measure taken by management to ensure compliance with standards, policies or procedures (Thatcher, 2003).

Authority – The right to correct command or determine a course of action (Kabanoff, Waldersee & Cohen, 1995).

Barrier – Degree of negative value placed on taking an action that may have health or safety benefits. Barriers could be factors like inconvenience, temporary discomfort, cost, degree of social acceptability, or pain.

Carbon Black – A product used as a strengthening agent for various equipment and automobile tires, which is a product that is produced by the XYZ Company. The automobile industry is the major consumer of carbon black, with approximately 80% of

production used by the tire industry. The remaining 20% of production is used for the production of inks, plastics, insulation cables and other specialty items.

Control Methods – Industrial hygiene or engineering practices that are implemented to control workplace exposures to unsafe or unhealthy aspects of a job situation. Examples of control methods include the use of a dust mask to prevent a worker from inhaling particles in a dusty environment, or the use of a hood to remove dust from the worker's breathing zone.

Delegation – The practice of sharing authority with others, with the individual delegating the authority retaining ultimate responsibility despite the sharing of authority.

Facility – The facility was the entire operational premises of the XYZ Company, which includes a work force consisting of 76 hourly bargaining employees and 35 management employees and active in the manufacturing of carbon black. The departments of the facility include Office, Shipping, Maintenance, Production, and Laboratory.

Lockout – The withholding of work from employees and closing down of a plant by an employer during a labor dispute.

Responsibility – The answerability of an individual to higher management for activities and results.

Norm – A person's perception that specific individuals or groups believe that he should or should not perform a behavior. An individual's norm may exert pressure to perform a given behavior, independent of the person's own attitude toward the behavior in question (Barling, Loughlin & Kelloway, 2002).

Target Behavior – The desired outcome of a training or motivational program that is intended to alter behaviors (Geller, 2003).

Modifier – The ability to limit or qualify as well as change the character or meaning. A modifier is the result of a form of change. A person who changes something; "an inveterate changer of the menu"(<http://lookwayup.com>).

Summary

The difference in perceptions regarding responsibility for workplace safety has the potential to undermine the effectiveness of a workplace safety program. In general, safety depends on the cooperation of employees at all levels of the organization. In situations in which management assumes that employees are taking a high level of responsibility for personal safety while employees assume that management is fully responsible for all safety matters, the safety initiatives and performance of the organization is likely to be impaired. The consequences of an ineffective safety program are higher direct and indirect costs for the organizations. The direct costs are generally associated with medical and rehabilitation expenses for injured workers and higher premiums for workman compensation insurance. In extreme situations, it can also result in adverse OSHA actions or the termination of insurance coverage. Indirect costs include disruptions to work procedures due to injuries and the possibility that the disruption will be severe enough to result in a loss of production. More insidious indirect costs are associated with decreases in job satisfaction levels among employees, which can result in lower productivity and poor retention levels. As a result, maximizing the potential that all

members of an organization will assume responsibility for safety is an important concern for businesses.

The following chapter will consist of a review of related literature, which formed the basis for the research questions and the development of the survey questionnaire. Chapter III will consist of a discussion of the methodology, which includes a discussion of the survey test instrument, sampling techniques, and other relevant aspects of the research design. Chapter IV will present the findings of the survey. Chapter V will provide a summary and conclusion, including recommendations for further research.

CHAPTER II

Review of Literature

Introduction

The review of literature regarding workplace safety was conducted to determine the extent and nature of previous research regarding the issues of safety in the workplace and the factors that can influence perceptions of responsibility for safety. It provided a basis for framing the research questions that the survey investigated by revealing the areas that have been the subject of previous research and by revealing the areas that have not been sufficiently investigated and warrant further research. Most of the literature review revealed that there have been no investigations of the differences between the perceptions of management and employees with regard to the perception of responsibility for workplace safety.

One of the factors revealed by the literature review was the lack of an agreed upon definition of management, with the majority of writers assuming that the reader understood the differences between managers and employees. In general, the use of the term management in the literature embraces the traditional definition of managers engaging in planning, organization, command, and control of business operations (Crainer, 2003, p. 45). Difficulties in understanding the interpretation of the term arise when there is emphasis on a single management function to the exclusion of the others. In addition, the literature assumes that the term management is generic to all organizations,

with relatively little distinction in the relevant management techniques between industrial or service types of business operations.

In most cases, the literature also makes a distinction between management and leadership. The way in which the distinction between the two concepts is generally articulated indicates that leadership involves inspiring others to embrace a shared vision to achieve a common goal while management involves providing the guidance that control actions necessary in order to achieve the goal (Yeakey, 2002). The leader must possess sufficient technical expertise to inspire confidence in the follower based on all the relevant circumstances of the situation. At the same time, the leader must have the social skills to communicate the vision to the follower and overcome resistance in such a way as to create a desire in the follower to move toward the vision with a minimum of management. In this theoretical model, the positions of the leader and follower are not hierarchical but rather are the result of the exercise of leadership skills by the leader. In effect, the leader cannot rely on position or organizational structure for authority but rather on the personal relationship with the follower that inspires trust, confidence, and a willingness to participate in the leader-follower relationship. In contrast, management implies a greater degree of coercive control, with the authority to control the actions of others created by position within the organizational hierarchy rather than by the personal characteristics of the manager. As a result, the ideal for the organization was for individuals in positions of authority to blend the characteristics of both leader and manager.

The literature review was organized in sections due the wide variety of organizational and behavioral factors examined in this survey. The organization was

largely based on the theoretical assumption that workplace safety was the function of the two fundamental attributes of organizational characteristics and the personal perceptions and practices of individual workers. The first section focuses on the history of employee and workplace safety which reveals the gradual evolution of perceptions regarding responsibility for safety. The second section focuses on the organizational climate and encompasses concepts such as the nature of management and leadership, and the way in which an organization's policies and procedures can inhibit or foster workplace safety. The third section examines the factors that influence attitudes and behaviors, which includes the relationship between safety and job satisfaction, training and knowledge. The final section of the literature review is a summary of the information.

History of Employee and Workplace Safety

In general, the literature regarding the history of the development of employee and workplace safety focuses on the role of OSHA in establishing standards for workplace safety. The implicit assumption in the majority of the literature was that management is solely responsible for workplace safety, with training of employees serving to further the objective of achieving a safe workplace. It did not view responsibility for workplace safety as a shared responsibility between management and employees, nor did it make a distinction between accountability and responsibility. In addition, some of the literature discusses the development of managerial and leadership theory in the course of the twentieth century. To a large degree, the mechanistic historical approach to workplace safety that allocates full responsibility to management is at odds with many of the more recently developed management and leadership theories that postulate fostering an organizational climate of shared responsibility that is more

compatible with partnership organizational structures than with hierarchical and authoritarian organizational structures.

Mintz (1984) provides a history of the development of OSHA and the approach to workplace safety that places regulatory responsibility on a government agency. OSHA was intended to establish consistent national safety standards for the workplace. Prior to the creation of OSHA, safety standards were extremely variable, with many firms viewing the costs of improved safety as outweighing the benefits. Although OSHA had broad regulatory powers, it also engaged in extensive cost benefit analyses in an attempt to demonstrate to business organizations that improvements in safety provided a tangible benefit and were not merely the outcome of intrusive government regulation. As a result, when the costs of implementing a safety measure exceeded the benefits as measured by the likelihood that the risk will be mitigated, OSHA did not mandate that the measure be implemented. In effect, OSHA recognized that the workplace could not be made totally risk free. The author's approach to responsibility for safety in the workplace follows that of OSHA, which assigns both responsibility and accountability to the management of an organization for implementing the standards set forth by OSHA. While management can delegate some degree of responsibility, it cannot delegate accountability.

Furthering Mintz's research, Daugherty (1996) offers an overview of the benefits that OSHA has provided along with some statistics regarding the effectiveness of the regulatory agency. Since the inception of OSHA in 1969, workplace fatalities decreased by approximately 50%. In addition the number of disabilities resulting from employment related injuries have decreased by more than one million a year. The author also provides

a qualitative assessment of the financial benefits that accrue to organizations as a result of OSHA and compliance with the standards.

In regards to compliance, it is a part of OSHA policy to issue citations to employers for workplace safety violations, which has created the general assumption that the employer has exclusive responsibility for workplace safety issues (Nelson, 2001). This policy is being frequently challenged in courts to establish a greater degree of employee responsibility as a matter of law. OSHA's policy to hold the employer with effective control over a site responsible for all safety matters was the outcome of a large number of safety violations that were occurring in construction during the early period of OSHA's evolution. Because there was uncertainty regarding the responsibilities of contractors and sub-contractors for safety, OSHA deemed the host employer fully responsible for safety. This doctrine is based on the language of the Occupational Safety and Health Act of 1970 that states each employer shall furnish a place of employment that is free from recognized hazards that are likely to cause death or serious harm to employees (Nelson, 2001). In practice, OSHA has extended the definition to include any type of injury that will result in a temporary disability to the worker. In cases in which a firm uses contractors, OSHA doctrine has evolved to place responsibility on the "controlling employer" who has primary responsibility for maintaining the worksite. The author contends that this creates a supervisory and disciplinary issue for controlling employers over contractors or outsourced personnel who work on premises. According to Nelson, court challenges to OSHA doctrines and policies have not been successful in creating a framework in which responsibility is shared between employer and employee.

For example, the attempts by Congress in 1997 to pass legislation that sought to reform OSHA by shifting its emphasis away from enforcement and towards a more consultative role with businesses with regard to safety issues (Reynolds, 1997). This legislation was in response to the growing concern among businesses that OSHA regulations were often unreasonable and placed a burden on businesses without creating improvements to safety. Employee advocates successfully opposed the legislation that believed voluntary employer compliance with safety measures would not be effective. One of the more important provisions of the bill was a section fostering the development of joint employee management safety councils in order to identify and mitigate hazards in the workplace, which would formalize a joint responsibility approach to safety. The provision died in committee, however, because employee advocates demanded equal representation on these councils. Because management would remain accountable for safety under the proposed legislation, business advocates were reluctant to formally share responsibility with employees on an equal basis.

Outside of the paradigm of OSHA, Crainer (2003) provides a historical overview of the early development of the concept of management, which is essentially a twentieth century paradigm. A century ago, management was largely undefined, with no systematic approach to providing guidance to workers or attempts to elicit the cooperation of workers to achieve organizational goals. The author indicates that the development of management concepts and theory required the recognition that management was a universal concept in every human activity with certain individuals appointed to coordinate and supervise the activity of others. The development of the concept of management, however, did not inevitably lead to a higher degree of cooperation between

management and employees, with managerial groups continuing to be perceived as apart from and in many cases superior to employees.

Morgan (2001) investigates the legal trend that began developing in the 1980s to hold executives of an organization criminally liable for deaths that occur in the workplace when there has been blatant and egregious disregard for compliance with safety standards. While the initial cases that involved criminal charges against management involved the purposeful removal of safety warnings and safety devices from equipment, the more recent cases appear to be adopting a less strict standard to determine criminal liability. A more recent case in Massachusetts, however, found the CEO of a firm liable for permitting the use of a forklift with defective brakes, which resulted in the death of two employees. The standard used by the court appears to have been knowingly and willfully permitting the operation of the equipment. Although these cases generally involve extreme situations, the author indicates that they support the dominant perception that responsibility for workplace safety rests with the managers. The perception was based on the presumption that although workers may knowingly operate equipment that presents safety hazards, as in the case of the forklift, they do not have the authority to remedy the situation. Such authority rests exclusively with management.

Various reports of the decisions of courts when confronted with the issue of responsibility for workplace safety indicated that management invariably has the duty to maintain a safe workplace, even in situations in which authority was delegated to others. An example of this type of court decision that typifies the trend in American jurisprudence comes from *Carvalho v. Toll Brothers*, 143 N.J.565 (Engineer, 1995). In the circumstances of this case, a township hired outside contractors to perform work,

during the course of which an employee of a sub-contractor was killed due to the negligence of the contractor. Prior to the accident, a town inspector was at the site and failed to examine the safety conditions. The court found that the township was not liable due to a legal technicality regarding notice, but indicated that if the technicality had been complied with, the township would have been vicariously liable. As a result, the current trend in the law is to hold the contracting organization liable for safety shortcomings of contractors, despite the difficulty faced by the contacting organization in discovering safety risks and enforcing appropriate safety practices.

Mack (2001) offers an overview of the development of safety measures in the workplace over the past fifty years with specific emphasis on hand protection. The author broadly indicates that the primary driving forces in the development of improved safety practices and procedures are technology and market demand. Technology produces the safety equipment and process design that contributes to safety enhancement. Market demand for improved safety creates the incentive for the development of new safety equipment or equipment with improved safety features and design. A component of market demand is governmental regulation, which can spur demand through the passage or enforcement of a new regulation or safety policy. Market demand, however, also depends on other factors such as the willingness of firms to maximize safety and the need to find cost-effective safety measures.

Abrams (2002) examines the current approach of OSHA toward ergonomic hazards in the workplace, which contrary to previous policies that were fully regulatory. The policy of OSHA towards economics issues is to issue citations to employers only under the general duty obligations, with a good-faith effort to reduce ergonomic hazards

evidence of the firm meeting its general duty obligations. As a result, citations will be issued only in the most egregious of hazard circumstances. Its enforcement focus will be confined to employers that have not made any effort to identify or mitigate ergonomic hazards. In areas other than ergonomics, however, OSHA will continue to issue citations based on its objective assessment of workplace safety conditions. In addition, in the area of ergonomics, the employer is free to choose any reasonable method of hazard reduction. In other areas, the hazard reduction methodology must conform to OSHA specifications. The author contends that the change in OSHA policies with respect to ergonomics does not constitute an overall change in the enforcement procedures but rather reflect the somewhat nature of ergonomic hazards that are often difficult to litigate. The author further indicates that OSHA is gradually expanding the types of hazards that it recognizes as workplace safety issues.

Pun and Hui (2002) create a model based on prior research to assist firms in integrating safety issues in its total quality management program in an attempt to meet the requirements of both ISO 9000 and OSHA'S 18001. In the course of the discussion of this model, the authors provide an overview of the development of occupational and health safety standards in the late 1990s. While OSHA is primarily concerned with the development of domestic safety standards in the United States, the International Organization for Standardization (ISO) is concerned with the development of international standards that are related. American firms that conduct international operations or have international clientele generally comply with both OSHA and ISO standards. In general, the OSHA standards are stricter than those involved with the ISO standards, with compliance with OSHA generally sufficient to establish compliance with

ISO standards. In the discussion of this issue, the authors indicate that the employees are responsible and accountable for accident prevention rather than the managers. The authors further contend that the competence of the employee is the key factor in effective safety implementation. Because the authors are writing from an international perspective, their approach to responsibility for safety differs from that generally found in the United States, which places full accountability for safety on management. Nonetheless, the authors indicate that the process of globalization is creating a shift in the perception of responsibility for safety, with international standards likely to become more prominent than domestic standards over the long term.

Ekhardt (2001) approaches the issue of responsibility for workplace safety from a moral perspective, concluding that while management has the primary responsibility for safety there remain a large number of trade offs necessary between safety and expediency. The author indicates that the law regarding safety is at the top of a hierarchy of safety evaluation principles, which creates a structural framework for addressing safety issues. Once the law is complied with, however, there remains a range of safety issues that are not covered by regulations and must be addressed from the perspective of the trade off between the duty of the employer to provide a safe workplace and the needs of the organization for production and productivity. To support the point, the author engages in a historical review of the development of laws regarding workplace safety. The author concludes that safety can only be partially legislated, with the primary factor in implementing safety as the willingness of the employer to accept responsibility that goes beyond the requirements of law.

Danna and Griffen (1999) present a review and synthesis of the literature that has been published regarding health and safety in the workplace, which provides an overview of the direction that has been taken by scholarly investigation of safety issues. The authors indicate that the topic of safety and occupational health has received increasing amounts of research due to the growing recognition that safety in the workplace is necessary to increase productivity and job satisfaction and to reduce costs. While this interest is partly due to the growth of external regulatory frameworks, it is also the result of the gradual development of a less adversarial relationship between management and employees in which both groups share responsibility for meeting the common good of the organization. The authors find that there has been considerable variation in the meanings of the elements of the various constructs and models used by researchers to investigate organizational and individual behaviors with respect to safety. The authors establish a model to organize the research and literature, with safety issues as a separate component of the model that has the potential to impact the overall health and well being of the individual worker. From this perspective, a large number of studies have shown that unsafe work conditions increase job-related stress, reduce job satisfaction and can impair the productivity of the workers. The authors further recommend the development of a unified conceptual model with standardized definitions of terms in order to foster a greater degree of consensus among researchers regarding the factors that can impact safety and other factors that impact the well being of workers.

Organizational Climate

In general, the literature investigating organizational climate focuses on a wide variety of factors that produce the work environment. There is a large body of literature investigating the nature of leadership and the distinction between leadership and management in a safety context. The literature broadly contends that the organizational structure as well as the leadership style has a impact on the development of an effective safety climate in a firm. Other literature examines the distinctions between a safety culture and safety climate. Because much of the literature investigating the way in which firm's structure, culture and climate impact safety are also involved with the investigation of human behavior, there is some overlap in the studies with the data presented in the section of the literature review concerned with human behavior. The inclusion of such literature in this section that deals with the organization as a whole was based on the preponderance of the evidence or argument presented in the literature.

Yeakey (2002) examines the way in which the military has embraced situational leadership theory and its development from the 1960s to the present. The American military continues to use situational theory as its primary leadership model, largely due to the authoritarian nature of military organizational structure. The concepts, however, are applicable to business organizations due to the similarities in the chain of command that occur regardless of whether the organization has adopted a hierarchical, matrix, functional or other type of structure. The author notes that Hersey and Blanchard originally developed situational leadership theory to distinguish between leadership and management. In this model, leadership involved inspiring others to voluntarily embrace a

vision while management involved providing guidance to control actions to achieve a goal. The leader must possess sufficient knowledge to inspire confidence in the follower based on all the relevant circumstances of the situation. At the same time, the leader must have the social skills to communicate the vision to the follower and overcome resistance in such a way as to create a desire in the follower to move toward the vision with a minimum of management. In this theoretical model, the positions of the leader and follower are not hierarchical, but rather are the result of the exercise of leadership skills by the leader. In effect, the leader cannot rely on position or organizational structure for authority, but rather on the personal relationship with the follower that inspires trust, confidence, and a willingness to participate in the leader-follower relationship. Because of the situational nature of leadership in this theory, different situations may call for different leaders or the exercise of different leadership skills by the same leader. The author contends that the situational approach provides the necessary flexibility for organizations, particularly when applied to military structures and situation.

Blair (2003) offers a qualitative assessment of the need for both leadership and safety culture in an organization to foster the development of an adequate safety program. While the author does not provide a definition of leadership, it appears to imply the development and communication of safety and management's commitment to safety as a high priority. The author does not indicate whether a particular style of leadership is superior to another in establishing safety leadership in the organization. In contrast, the definition of safety culture is an observable degree of effort by all members of the organization to achieve the safety. The author argues that establishing safety culture is a basic process of determining the inputs that will produce safety, establishing safe

processes, and communicating the processes to the individuals that will be engaged in performing tasks. Establishing a safety culture, however, cannot occur without a strong commitment from management. In general, the author takes the position that establishing a safety culture is the responsibility of management, with the employees only tangentially participating in the process through assistance in providing data regarding processes and procedures.

Gaspers (Executive, 2002) provides a qualitative examination of the greater degree of effectiveness in workplace safety programs that occurs when the CEO and other senior managers articulate workplace safety as a high priority for the firm. The author indicates that workplace safety is essentially a social responsibility issue for the organization, with the organization owing a duty to employees to maintain as safe a workplace as possible. From this viewpoint, senior management of a firm provides the leadership initiative by establishing a vision for workplace safety and encouraging subordinates throughout the organization to embrace the vision. The author also recommends the development of policies and procedures for addressing safety issues that involve the cooperation of both management and employees, with management responsible for the overall development and execution of a safety plan.

In a related report, Gaspers (Experience, 2002) provides a qualitative assessment of responsibility for workplace safety. The author broadly suggests that there are two tiers of responsibility for safety that rest with OSHA and management. There is a general tendency in work environments for management to rely exclusively on OSHA for defining the safety parameters in the workplace, with compliance to the standards fully discharging management's responsibility. The author contends, however, that

management has a broader responsibility for safety that should include the identification and mitigation of all potential hazards and not merely those identified by OSHA. The author does not include any discussion of potential employee responsibility for workplace safety, which reflects the dominant paradigm in organizations that have developed an adversarial relationship between management and employees.

Foghrasher (1999) also provides a qualitative opinion indicating that management must be committed to workplace safety in order for an organization to develop and implement an effective safety program. The author stresses the cost benefit approach to workplace safety, suggesting that the costs of implementing safety measures are far less than the costs that can accrue as a result of accidents and injuries. As a result, the development and implementation of effective safety programs provides a economic benefit to firms. The author indicates that the key factors in an organization's approach to safety are demonstrated management involvement, a written safety policy and defined safety responsibilities. The author takes the perspective, however, that responsibility for safety is essentially a management task, and that employees are primarily involved with convincing management that a safety program should be implemented. This is based on the assumption that management does not inherently see the benefits of effective safety programs. The author does not address the issues that can arise when employees are non-compliant with the policies and procedures established by management. To a large degree, the author adopts the position that meeting the formal requirements of outside agencies such as OSHA is sufficient to establish an effective safety program.

Zoller (2003) conducted a survey of an automobile manufacturing plant and determined that the way in which the health and safety program was structured tended to

exclude the actual experience of employees with respect to workplace injuries and work related illnesses. The author gathered data based on interviews, comparing the verbal reporting to the researcher of employee experiences with the content of the firm's reports on adverse safety incidents. The author also noted that there was no research regarding the role of discourse within an organization in shaping the definition of hazards, negotiating risk and constructing norms that meet the requirements of both managers and employees with respect to safety concerns. The author concludes that the structure of the organization that was investigated together with its existing policies and procedures inhibited employee discourse regarding safety issues by creating some degree of concern that disciplinary action would be taken in the event that an employee exceeded their authority with respect to safety issues. The author further contends that an organization must develop a policy that includes employees in establishing safety norms in order to shift responsibility for safety from management to the individual workers in the organization, which is necessary in order to achieve safety.

Bellus (2002) provides a qualitative overview of risk management in large business organizations, which is essentially a methodology for the identification of hazards, the assignment of probability that the adverse event will occur, and the determination of the steps that are necessary in order to reduce the likelihood of occurrence. The author approaches the failure of a large number of risk management programs in large organizations was due to the approach to risk mitigation that viewed it as solely a task of management. Achieving operational safety requires the input of the employees that are actually engaged in operations, and cannot be performed solely by management. The author also indicates that the most common method for identifying

risks in an organization is to rely on the written reports of past adverse events, which are often incomplete and do not consider the risk potential of hazards that may produce harm in the future.

Geronsin (2001) provides a more comprehensive approach to the process of identify and mitigating risk in the workplace. The analysis of risk can be quantified to some degree through the use of a risk analysis matrix that categorizes identified risks in accordance with the magnitude of the harm that can occur from the adverse event. It is based on the assumption that an environment cannot be made totally safe, but that the risks that will result in a high level of harm and are likely to occur should receive the utmost mitigation attention. The author recommends the use of the Job Hazards Assessment (JHA) technique in the analysis of risk, which assigns responsibility for risk management, requires the identification of current and potential hazards, conducts an analysis of probability and severity, and formulates mitigating responses. The author indicates that the two critical areas in risk analysis and mitigation are the identification phase, which requires input from a wide variety of sources within the organization, and the mitigation phase, which requires the cooperation of both management and employees in reducing the potential for occurrence of an adverse event. The author further indicates that it is the responsibility of management to establish a coherent risk mitigation plan, but that it is the responsibility of all employees to participate in the process in order to ensure that it will meet the intended objective of improving safety.

McManus (2000) offers a qualitative assessment of the interrelationship between managerial and employee responsibility in an organization. While management may develop standards and practices to improve safety, in many situations the individual

employees do not follow the safety standards and practices. The task of compelling compliance is very difficult, and requires an intensive supervisory presence that can have a negative impact on job satisfaction and performance in its own right. As a result, the author contends that it is necessary to change employee behavior through non-intrusive methods. These methods focus on extensive training, continual discussion of safety issues and concerns and bestowing recognition on individuals and groups for achieving a good safety record. The author provides anecdotal evidence indicating that this approach produced a change in employee behavior and a greater degree of acceptance of personal responsibility for safety by employees. The author further questions the wisdom of the current system of hazard identification and mitigation that places heavy responsibility on outside agencies such as OSHA and management of organizations, while failing to effectively develop the means to shift some degree of responsibility to the employees that have the highest degree of exposure to workplace risks. As a result, there remains a great deal of uncertainty regarding who determines the nature and level of mitigation of workplace risks.

Wortham (1998) also indicates that workplace safety measures cannot be effective unless employees are included in a participatory approach to safety and hazard mitigation. The author takes an ergonomics perspective towards workplace safety, and indicates that the input of employees is necessary in order for management to effectively improve safety. To some degree, the author suggests that it is the responsibility of management to form a collaborative relationship with employees in order to identify and mitigate workplace hazards. In addition, the author indicates that employees are more likely to be compliant with workplace safety programs when they have been part of the

decision-making process. The author argues that the participatory approach is essential for employees to adopt some degree of responsibility for safety. From this perspective, the organizational structure and management policies with respect to the identification and mitigation of safety issues is the critical factor in sharing responsibility for safety between management and employees, and in making a distinction between accountability and responsibility.

In contrast, Schaechtel (1997) indicates that safety responsibility is primarily the responsibility of line managers and supervisors. The author indicates that safety is only one of the priorities of line managers and supervisors who are also concerned with many other operational factors such as costs, schedules, and equipment maintenance. As a result, the degree of attention that a line manager gives to safety issues is largely dependent on the degree of emphasis that the organization as whole places on safety. Evidence of a high degree of organizational commitment to safety comes from established safety standards that are communicated to all personnel, and a policy that clearly assigns responsibilities for implementing the organizational standards. In addition, organizational emphasis on safety is fostered by record keeping regarding how well the standards are met and internal supervisory and management controls that ensure the standards are met. With respect to assigning responsibilities, the author suggests that the skills and interests of non-supervisory personnel should be considered. As a result, a line manager or supervisor should attempt to engage all employees and delegate some safety responsibilities. In all situations, however, the responsibilities should be written and agreed upon by all personnel. The author indicates that ideally, delegated responsibilities for safety should be written into job descriptions and should be considered as a factor in

performance appraisals. The delegation of responsibility to employees, however, does not relieve the line manager or supervisor from accountability. In effect, the author recommends the development of a corporate culture that shares responsibility for safety between management and employees, with the respective duties of each individual involved with safety clearly defined and formally accepted. This established a routine approach to safety that ensures standardization of the way in which responsibility is delegated throughout the organization.

Lissy (1995) provides anecdotal evidence regarding the need for employers to discipline workers who disregard safety rules while simultaneously demonstrating the complexity of the issues that many firms face when attempting to impose such discipline. The author contends that management has full responsibility for setting safety rules and for ensuring that the rules are followed by employees. The administrative difficulties arise when the employee objects to the disciplinary action, which necessitates a hearing and the production of evidence on the part of management to support the disciplinary measure. As a result, extensive recordkeeping as well as close supervision of employees are necessary. The author contends that management has the sole responsibility in both tradition and law for providing a safe workplace, and essentially argues that employees are instrumentalities of the organization that are obliged to follow the directives of management. The author further suggests that clear and precise safety rules are necessary; essentially assuming that management can recognize all potential hazards and establish comprehensive safety standards.

Barling, Loughlin and Kellway (2002) conducted empirical research to determine if the use of the transformational leadership style in an organization could be linked to a

lower rate of occupational injuries among the workforce. The authors analyzed data from a test instrument administered to 174 restaurants to determine the type of leadership style used in the organization and compared the results with data regarding injuries from the same organizations. The authors found strong support for a model indicating that the use of a transformational leadership style produced a lower rate of accidents. The transformational leadership style emphasizes the development of responsibility among subordinates to achieve the common goal that is often jointly set by management and employees. The objective of the leadership style is to empower employees to take a greater degree of responsibility not only for their own actions, but also for achieving corporate goals. The authors contend that this type of leadership produced a lower rate of accidents by enhancing the overall safety climate of the organization and by increasing the consciousness of employees with respect to safety-related issues.

Mearns and Flin (1999) provide a qualitative examination of the concepts of safety culture and safety climate, arguing that although the two terms are used interchangeably, they represent distinct concepts. The term safety climate describes employees' perceptions, beliefs and attitudes towards safety, and would include factors such as employees' perceptions of their responsibilities in developing and maintaining a safe working environment. To a large degree, safety climate is the product of individual cognition, which is based on personal factors such as education and experience. The term safety culture is more complex and reflects the attitudes, norms and expectations of the organization as a whole with respect to safety. From this perspective, the organization establishes the relative emphasis that is placed on safety, with safety climate an outcome of the safety culture of the organization as well as other individualized factors. The

authors indicate that it is far easier to conduct empirical testing of safety climate because it involves factors that can be more readily measured, such as the exact nature of perceptions, beliefs and attitudes. In contrast, the safety culture of an organization is far more complex, and is the result of the interrelationship of a wide variety of organizational factors. The fact that many studies have used the terms climate and culture interchangeably has led to the development of a greater degree of confusion with respect to the development of models and the evaluation of data.

Coyle, Sleeman and Adams (1995) conducted research to establish the link between safety climate and accident rates in clerical and service organizations, with their research typical of the large number of studies that have determined that such a link exists. The authors developed a questionnaire test instrument to operationalize the various concepts that comprise safety climate, and adopted an organization-wide perspective for the survey. The employees responding to the questionnaire revealed that the organizations under survey had different safety climates as defined by the researchers. In organizations in which the safety climate was relatively weak, there was a higher rate of accidents. Conversely, in organizations that the employees perceived as having a stronger safety climate, the rate of accidents was lower. The authors indicate that the use of safety climate measures were important for organizations to assess the actual state of their safety climate, and to formulate appropriate interventions to create a greater perception and awareness of safety among employees.

Hoffman and Stetzer (1996) conducted research to determine the influence of four specific factors on safety. These factors were group process, safety climate, intention to approach other team members engaged in unsafe behavior and perception of role

overload. Data was collected from individuals in a single chemical manufacturing plant in the Midwest. The authors operationalized the concepts under investigation in a survey test instrument. The authors found that of the factors under survey, the most correlation occurred with safety climate, with a climate that had a strong emphasis on safety producing a lower rate of accidents. The findings of the survey also indicate that the intention to approach other team members engaged in unsafe behaviors tended to mediate unsafe behaviors, but at with a lower correlation than safety climate. The author's discussion suggests that a strong safety climate in an organization is the result of a greater degree of balance between safety and the inherent background issue in manufacturing organizations of the need to accomplish work as quickly as possible. In addition, the authors indicate that social pressure has more impact on safety behaviors than formalized rules, with safety climate one of the antecedent factors that helps to produce social pressure to conform to safety standards. In this model, group practices and norms also formed one of the more important components of the social pressure placed on the individual that demanded conformity to safety standards.

Hoffmann and Stetzer (1998) investigate the processes used by organizations in determining the causes of accidents, and conclude that there is a strong emphasis on identifying guilt rather than on remedying the underlying causes of the safety issue. The authors created a model indicating that this tendency to place blame is the outcome of the fundamental attribution error in human behavior, which is the tendency to overestimate the influence of personal factors and underestimate the influence of situational factors on the behavior of others. In addition, the authors' model contends that there is a tendency towards the defensive attribution bias among employees when an accident occurs, which

is the tendency for employees to perceive themselves as similarly situated to the victim and to make external attributions as to the cause of the accident. As a result of these attribution errors, management generally attempts to affix personal blame on the individual that was injured while employees tend to affix blame on factors other than the actions of the individual who was injured. The authors conducted empirical research to determine if the impact of these attribution errors can be minimized through the development of a safety climate in the organization that fosters a high level of communication between management and employees with respect to safety issues and encourages an objective assessment of accidents. The findings of the research indicated that there was a difference between the attributions of supervisors and employees regarding accidents, with supervisors tending to place blame on employees for accidents. The research, however, did not find that a higher level of communication in the organization produced a reduction in the level of defensive attributions among employees. The authors indicate that this finding should be approached cautiously and may be the result of the survey design. This conclusion is based on other indicators in the findings showing that employee groups in organizations with closed communications are more likely to attribute accidents to external causes.

DeJoy (1994) conducted research into the connection between attribution in workplace safety and the type of remedial action that was undertaken. The author contends that safety processes are inherently ambiguous, and there is a general tendency to attribute the cause of accidents to a number of factors other than the root cause of the accidents. In the findings of the survey, it was determined that workers tend to attribute the cause of accidents to external sources such as management policies or the nature of

the work environment. Management, in contrast, tends to attribute accidents to negligence on the part of the employee or the unwillingness of the employee to follow established safety rules and procedures. As a result of these findings, the author contends that it is difficult to use existing databases in order to research the causes of accidents because the data are generally biased in accordance with the perspective of the individual preparing the safety incident report. The author further argues that the supervisory level is the most critical point in promoting safety in the workplace because it is the interface between management and employees. The author suggests that supervisors should attempt to be unbiased when investigating the cause of accidents in order to develop and deploy appropriate remedies to prevent future occurrences.

Kabanoff (1991) conducts an examination of the way in which equity theory, distributive justice and equality operate in organizations to shape expectations and behaviors. To a large degree, these factors are reflected in the values espoused by the organization. The author contends that the violation of the normative principles of equity within the organization creates conflict in the form of a desire by the individual members of the organization for the restoration of justice. Another type of conflict that occurs in organization is the result of the breakdown in organizational cohesiveness due to the failure of the organization to communicate values and to foster compliance with values. This produces a high degree of uncertainty among the individual members of the organization regarding the nature of the values, which then manifests itself as conflict when actions are taken that are perceived as violating the assumed core values of the organization. The lack of cohesiveness in an organization has the most impact when change is implemented due to the variable perceptions regarding the way in which the

change affects values. The author also discusses various strategies intended to reduce conflict and improve value communication and cohesion.

Kabanoff, Waldersee and Cohen (1995) examined the value structure of large organizations in order to create a broad model of organizational values and to determine if the nature of organizational value structure impacts the way in which change is implemented. The authors examined nine dimensions of values that included authoritative, performance, reward, normative, commitment, leadership, teamwork and affiliation. The findings of the survey indicate that organizations can be classified as elite, leadership-oriented, meritocratic, or collegial. These basic structures are intended to meet the organizational need for cohesion and performance. Organizational values are broadly defined as the socially desirable modes of conduct within the organization that is intended to produce the intended end result. The authors further postulate that there is a relationship between structure and process in an organization, with the structure influencing the types of processes and the types of processes influencing the structure. The authors also contend that the organizational values have an impact on the way in which change is presented and accomplished within the organization. The findings of the survey conducted by the authors indicate that change is indeed presented differently in the four basic types of value structures of organizations. The limitations of the survey, however, prevented the authors from determining which of the four structures appeared to be the best for facilitating change.

Attitudes and Reports of Behavior

The literature examining attitudes and behaviors with respect to employees and managers in the workplace generally relies on behavioral models developed in the field of psychology. These models presume that behavior is produced by the attitudes and beliefs of the individual. The attitudes and beliefs, in turn are formed by a wide variety of factors such as personal knowledge and experience, societal norms, peer pressure, and the climate and culture of the organization. As a result, there is an extraordinarily large number factor that can influence attitudes and beliefs, with the majority of research attempting to focus on a relatively small number in order to limit the scope of the studies. In addition, the current status of behavioral research with respect to safety appears to remain focused on the identification of factors that influence attitudes and perceptions, with relatively few attempts to determine if attitudes and beliefs, and thus behavior, can be altered as the result of an intervention.

Amparo et al (2002) conducted research that established the connection between the safety culture and climate of the organization and personal behaviors and perceptions as separate yet interdependent factors that influence safety in the workplace. This research identified the impact of a large number of organizational and personal variables on safety through the use of questionnaires distributed to a large study population in a number of industries. The purpose of the research was to construct a model that articulated the way in which safety climate impacts safety, individual behaviors impact safety, and the moderating force that each of the broad constructs exercised on each other. The findings of the survey indicated that all of the variables of the survey that

measured climate and behavioral factors could be correlated with safety. The findings further indicated that the variables of behavior operated as a greater mediator on the climate variables than the climate variables did on the behavior variables. In effect, a weak safety climate was compensated for by positive safety behaviors by individual workers, which reduced the rate of accidents. The converse effect of a strong safety climate moderating the behaviors of individual workers, however, was not supported by the findings. This suggests that a positive safety climate by itself is not sufficient to reduce accidents and improve safety. The findings of the survey also showed that the best safety performance record occurred in organizations with both a strong safety climate and a high level of responsible safety behaviors by the individual employees. In the model established by the authors as the result of the survey, individual behavior is not directly related to perceptions of the physical work environment.

Thatcher (2003) offers a qualitative discussion of the difference between attempting to modify safety behaviors in the absence of a safety culture in an organization and the attempt to modify behaviors after the creation of a safety culture. The author takes a collaborative position on the issue of safety, indicating that it is the responsibility of both management and employees to jointly develop and implement a safety culture in the organization. The collaborative approach tends to create a social environment in the organization in which peer pressure operates to foster the development of safety consciousness and compliance with safety standards. In contrast, the attempt by management alone to implement safety standards through behavioral modification techniques in the absence of a safety culture in the organization is more likely to meet with resistance that results in non-compliance and potentially lower job

satisfaction levels. The author identifies the collaborative approach as “bottom-up” safety, with the employees participating in setting the safety standards and in ensuring compliance with the standards. The author further argues that the approach to safety as solely a management responsibility has been tried by organizations for decades, but has met with resistance from employees. In effect, the behavior of the employees can be modified only with their cooperation and assumption of some degree of responsibility for safety issues in the workplace.

Hayes et al (1998) provides a report on the development and validation of a Work Safety Scale (WSS) that was intended to function as a predictor of the likelihood of accidents in the workplace based on the behaviors identified through the administration of the scale. The scale has five constructs in the form of work safety, job safety, coworker safety, supervisor safety and management safety practices, each of which measure distinct areas of perceptions and behaviors with respect to safety. The focus of the scale is employees’ perceptions of safety on the job, and the validation of the instrument was not intended to assess management perspectives. When validating the scale through empirical research, the authors found that the best predictors of the occurrence of accidents were the perceptions of supervisor safety and managerial safety practices. While the authors draw no definitive conclusions from this finding, they do suggest that the perceptions of employees of supervisor and management practices were likely to be a reflection of actual supervisor and management practices. In the cases where employee perception viewed supervisor and management practices as unsafe, there were a higher level of accidents than in cases where employee perceptions regarded supervisor and management practices as safe.

Mclain (1995) engaged in empirical research to create a conceptual definition of the experiences of employees with respect to safety risks, contending that there is no functional model that enables cogent research into the experiential factors that shape employees perceptions toward safety issues. The author indicates that there has been relatively little research into the relationship between perceptions of safety and factors such as stress, job satisfaction and task performance. The research that does exist indicates that individuals vary in their interpretations of safety risk, task characteristics and work environments. Cognitive interpretation of risk is characterized by an interpretation of the magnitude of potential harm and likelihood of occurrence that is based on a wide variety of factors such as prior experience, cognitive knowledge, and even social position. There is evidence that a perception that the work environment is unsafe negatively contributes to job satisfaction by raising stress levels. In addition, the author indicates that a perception of high risk operates as a distraction to task performance over the long term due to the perceived need to cognitively process a greater amount of information in order to ensure that an adverse event will not occur. The author's research evaluated perceptions of risk on a five-tiered ordinal scale that was specifically developed for the survey. The perception of risk was then matched against the results of test instruments that determined the level of stress, the level of job satisfaction, and the level of productivity of employees. The author concluded that the perception of risk was not in accordance with an objective assessment of the risk level. In addition, the author found support for an increased perception of risk increases stress, and reduces job satisfaction and performance.

Vinokaur-Kaplan, Jayaratne and Chess (1994) examined a variety of factors that influenced the decision of social workers with respect to job satisfaction, motivation and intention to seek new positions. The purpose of the survey was to determine the impact of the factors on behaviors of the employees. The survey determined that safety concerns were one of the leading factors producing low job satisfaction and motivation, and prompting the desire to seek a new place of employment. From the perspective of the survey, safety referred to the physical safety of the employee when engaged in field social work operations. In addition to safety, the survey found that other factors such as salary level, fringe benefits and job security also contributed to job satisfaction, motivation and retention. The survey did not determine the relative level of the impact of the various factors on behavior, and suggested that the factors were interrelated to a large extent. For example, a higher salary could mitigate the negative behavioral effects of poor safety conditions. The survey did not attempt to quantify the threshold levels at which the factors would prompt a change in employee behavior.

Zohar (2000) developed and tested a group model of safety climate that was derived from the organizational model developed by previous researchers. At the group level, climate perceptions are related to the actual safety practices of supervisors rather than to the overall policies and procedures of the organization, and as a result were very local. In addition, the nature of the safety climate was established by perceptions, which the author contends is the integral component of the safety climate and which supercedes policies and practices. The author used a scale to measure perceptions of safety climate that was specifically developed for the research. The research was conducted in a single manufacturing facility. The findings of the survey indicate that there was a high degree of

homogeneity in safety climate perceptions within work groups, but that there was a substantial degree of variation in perceptions between work groups. This suggests that safety climate is more dependent on the behaviors and practices of immediate supervisors than on the policies and practices of the organization as a whole. The validity of the research was established by determining a correspondence between perceptions of a strong safety climate and a relatively low number of incidents with a work group that required medical attention. Based on this finding, the author indicates that their scale to evaluate safety climate is predictive of the actual accident rate in a work group and can serve as a source of information for the organization regarding the extent and nature of training interventions that could improve the safety behaviors and performance of the supervisor, which translates into a stronger safety climate for the work group.

Neal and Griffin (2002) developed a model that proposed a link between safety climate in an organization and safety behavior, which is based on the prior research of the authors and other studies. The authors indicate that prior research has not clearly established the dimensions that impact the existence of a safety climate in an organization, which the authors contend is the result of confusion between safety climate in an organization and actual attitudes and behaviors. From the perspective of the researchers, the safety climate is the antecedent of safety attitudes and behaviors, with the climate in a cause-and-effect relationship with attitudes and behavior. In the model established by the authors, safety climate promotes the acquisition of safety knowledge and skills as well as the development of safety motivation among employees. The knowledge, skills and motivation in turn produce safety attitudes and behaviors that result in a greater degree of compliance with safety standards and participation in safety

initiatives. The earlier research of the authors suggested that an organization can establish a positive safety climate through the implementation of a wide variety of initiatives that include managerial commitment to safety, open communications on safety issues, and a well developed and written safety policy. The model postulated by the authors indicates that employee commitment to safety is the outcome of the organizational climate and general approach toward safety. The model does not directly address the issues of actual or perceived responsibility for safety issues in the organization, but does suggest that the optimum climate occurs when all individuals share some degree of safety responsibility.

Barling, Kelloway and Iverson (2003) conducted empirical research to determine if there was a correlation between the quality of a job and injury rates among employees. A high-quality job was defined as one that required extensive training and offered a high degree of autonomy and variety of work processes. The research involved the use of an existing Australian database that identified the occurrence and nature of an injury as well as the type of occupation of the individual that was injured. The findings of the survey indicated that there was a lower rate of injury in high quality jobs when compared to the total rate of injury for all types of jobs. The authors contend that this finding is due to the higher levels of job satisfaction among individuals with higher quality jobs, which results in the automatic acceptance of a higher degree of responsibility for work related safety issues. In the model developed by the survey, the high levels of job satisfaction in certain types of employment produced the behaviors that result in lower injury rates. The authors also indicate that the cause-and-effect relationship that is postulated requires further specific research to be substantiated.

Cox (1998) conducted a survey of manufacturing firms in Great Britain and determined that there is a causal link between the perceptions of control over safety issues by employees and behaviors of employees with respect to safety. The authors postulated that the attitudes of employees toward safety can be determined by their individual safety actions as well as the safety actions of management and the quality of the employees' safety training. The majority of employees indicated that they believed that they did not have control over safety issues, which was perceived as fully under the control of management. The authors indicated that the perception of control was the most important factor in determining the safety actions of employees, with a relatively low locus of control producing a lower level of employee involvement with safety issues. This factor was found to be more influential with respect to behaviors than other factors such as experience or training. The authors also suggest that the level of safety commitment by employees can be improved through increasing the locus of control of employees over safety issues. In addition, the authors indicate that a higher level of commitment to safety by management is likely to raise the overall safety culture in the organization.

Hoffmann, Morgeson and Gerras (2003) conducted organizational climate research to determine the factors that influence behaviors of employees with specific emphasis on safety. The authors determined that the climate fostered by the organization fosters or inhibits a leadership relationship exchange. In organizations in which safety is given a high degree of emphasis and is characterized by a leadership style such as the transformational style that encourages a greater degree of employee responsibility, there is a greater level of involvement and knowledge of employees with safety issues. The

authors contend that the leadership climate of the organization can function to expand the role of the employee, which produced changes in employee behavior that were consistent with achieving the organizations of a safer work environment. The authors also found that in organizations that had a positive safety climate but did not use a leadership style that encouraged the development of leadership behaviors among employees, the impact on safety was less than in organizations with both a positive safety climate and a high degree of encouragement that employees adopt leadership roles. The authors suggest that while individual factors are responsible for producing behavior, one of the more important factors is the leadership style and safety climate adopted by the organization.

Adams, Bochner and Bilik (1998) conducted research to examine the effectiveness of warning signs, and concluded that the nature and appearance of the signs were of less significance in influencing behavior than social factors that encouraged compliance with safety standards. Previous research had indicated that warning signs should contain a certain number of fixed components in order to draw attention and to be recognized as a warning by workers. The current research presented workers with five versions of warning signs, some of which omitted a great deal of information that has been recommended for inclusion in such signs. The findings of the research indicated that when warning signs were viewed singly, the signs that were missing components were not rated more poorly than the signs containing all of the recommended components. This suggests that individuals viewing a warning sign in a specific context such as a workplace recognize the warning from prior experience or knowledge and do not require a full and complete warning in order for the individual to cognate that there is a hazard present. The research also found an unusual and not well studied third-person effect in which the

individual viewing the incomplete sign recognized the danger and stated they would comply with safety procedures, but were concerned that other individuals would not be able to recognize the hazard based solely on an incomplete sign. On the basis of this unexpected finding, the authors conclude that social factors play an important role in the development of warnings for workplace hazards, with concern for other workers taking priority over concern for the self.

Rundmo (1995) conducted research regarding the perception of safety risks among both injured and non-injured workers in the petroleum industry. The author found that employees who had been injured tend to have a perception of a greater level of risk than employees who had not been injured. The author attributes this to a greater degree of awareness regarding the identification of hazards for individuals that have been injured. In addition, the author found that the perception of risks among the workers who had been injured coincided with an objective evaluation of the actual nature and magnitude of the risk. The author also found that employees who have been injured show a higher level of dissatisfaction with existing safety programs when compared to workers who had not been injured. This led to a lower level of job satisfaction among the workers who had been injured. While the survey does not directly address the issue of perceptions of responsibility for safety, workers who have been injured appear to attribute responsibility for the injury to inadequate safety programs enacted by management. In addition, the workers who have been injured appear to take a greater degree of responsibility for preventing a subsequent injury, regardless of their perceptions of the responsibility of management.

Geller (2003) provides an overview of the literature and research that examines the validity of the use of fear as a means of altering behavior in order to achieve compliance with safety programs. In this context, a fear appeal is a persuasive message that attempts to motivate and direct behaviors by focusing on the consequences of the failure to implement the prescribed behavior. These types of messages consist of a threat component and an action component. The successful use of this type of message requires that the intended audience have the perception that it has the power and ability to undertake the required action, and that the required action can reduce or eliminate the threat. The author does indicate, however, that the use of fear to induce action is highly situational, with the outcome of using such a motivational method sometimes uncertain. This occurs when the audience does not perceive the danger, or becomes resentful due to the use of intimidation to coerce an action. As a result, the author indicates that this type of approach should not be the primary method to attempt to modify behaviors in the workplace due to the potential that it can produce an adversarial atmosphere. In addition, the motivational ability of this type of message largely depends on the willingness to change of the audience, with a high level of resistance to change reducing the effectiveness. In summary, the author indicates that the fear approach is best suited in situations where there is little or no awareness of the danger, which is identified as the pre-contemplation phase of motivation.

Sheehan (1999) offers a qualitative discussion of the tendency in organizations to view statistical measures of safety as the goal of safety programs, which has the strong potential to induce managers and employees to take inappropriate actions in order to achieve compliance with the measure. The author argues that it is management's

responsibility to make value judgments regarding the level of safety that is desirable in an organization and to take the steps necessary to implement that level. One of the most commonly used methods to determine movement towards management with respect to safety is to establish some type of metric such as the number of accidents, or the number of work-hours without an accident. The author contends that this high degree of focus on statistics results in a lack of understanding of the root causes of accidents, which are often systemic in nature. As a result, safety is seen as merely taking precautions against injury, which is a behavioral matter. The existence of a systemic hazard, however, continually poses a risk that can be mitigated only through appropriate behaviors. Eliminating a systemic risk involves understanding the root cause of the hazard and redesigning systems in order to reduce or eliminate the risk. Such systems redesign reduces the need to rely on the behaviors of employees as a critical component of safety programs.

Change Theory

Many theories and fashions come and go in the field of management. Companies are faced constantly with the choice between following fashion, sticking to tradition or challenging both while seeking new perspectives on management principles. The air of certainty and stability that prevailed during the 1960s and early 1970s gave rise to a proliferation of analysis and planning tools within the field of change theory. They were based on the belief that economies, markets and customers behaved logically and predictably. They treated strategy as a puzzle, in which the 'right answer' could be found through the application of strategic tools. The rapidly changing business world with technological and business trends evolving proved particularly challenging for strategic

management in the year 2000. However, strategic change management was necessary in order for businesses to grow and remain competitive in the long-range future.

Faced with the extraordinary changes and levels of complexity in today's business world, managers will have to watch the traditional sources of power erode and along with archaic management theories. Competitive pressure to survive these pressures will force companies to become more flexible with both strategies and structures. This can also call for changes in the forms of communication, such as horizontal communication along with diagonal communication with management. These new forms of communication allow for more cross-departmental communication on issues that concern safety in the workplace. The best organizations are able to be flexible and adapt to strategic changes. Part of this adaptation entails the ability to understand the present and respond to changes in the competitive environment as they occur. The approach of constantly sensing and reflecting on what is happening, drawing conclusions, lessons, and then experimenting with new ways of acting, is described by strategic management thinker Henry Mintzberg as the learning approach to change management.

Knowledge management or learning organizations, represent a new paradigm shift in the way organizations look at change. Although there is some controversy over the definition of the term "learning organization" Garvin (1993) succinctly notes that "A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights" (p.80). With this definition it is possible to employ a greater understanding of the function of change within the organization. Organizational change can be seen as the catalyst for

inducing thinking, growing and learning, making an organization almost organic in nature (Nonaka, 1998):

A company is not a machine but a living organism. Much like an individual, it can have a collective sense of identity and fundamental purpose. This is the organizational equivalent of self-knowledge—a shared understanding of what the company stands for, where it is going, what kind of world it wants to live in and, more important, how to make that world a reality (p. 25).

Applying this knowledge in a practical real-world setting, it would seem that managers would have an obligation to move organizational structure towards a more open forum in which employees are apprised of any and all information that can or may affect change. This would include such realities as downsizing and mergers. Despite what many managers promote as an “open door policy,” it seems that when it comes to change, managers typically want to hear from their employees, but are not as forth coming with information as their subordinates. What is perhaps most perplexing about this situation is that when there is an impetus for change in the organization many employees are left out of the loop until the last minute and as a result become disgruntled or cannot help in the capacity in which they would feel most comfortable.

However, it is necessary for organizations to engage in strategic change management to survive and grow. It is a process that responds to the trends and the changes that an industry goes through. Now, more than ever, strategic management is important due to the rapidly changing business world in light of technological and global

changes which became particularly complex in the late 1990's. Therefore, strategic management is quintessential for the long-term growth and survival of any organization.

A strategically oriented organization will give a large contribution to the success of an industry. They will lead in strategic decision-making, goal outlines, industry trends, and over all productivity. Productivity is the key for any corporation, for without productivity and success organizations cannot compete in the technological and international realm of today's business world.

The last 10 years have provided an evolution in change theory and how to implement safety standards within an organization. The scope of the discipline has broadened to a more macro dynamic or what is known as a strategic perspective. This perspective is called Strategic Human Resource Management (SHRM) and emphasizes the importance of change in the strategy of an organization's performance. Emphasis is placed upon assessing environmental change and adapting the organization to the resulting threats and opportunities. Strategic decisions are global, cut across functional lines, and usually involve long-time horizons and long-term resource commitments and risks that make up the culture of the organization.

Schuler and Jackson (1988) point to the fact that an organization that engages in a particular strategic way of doing business must adopt effective ways of change management (Schuler & Jackson, 1988). In theory, the greater the success of joining management practices and with change strategies leads to greater performance for the organization. The evidence to support this assumption was illustrated by Schuler and Jackson (1988) and Arthur (1992) in studies that followed different strategies of change

management. Studies have shown that productivity and profitability are affected by change management practices within organizations (Arthur, 1992).

Summary

The review of literature reveals that there has been an amount of research regarding factors that can impact safety such as the safety climate and culture of an organization, the actual behaviors of individuals regarding safety, and the antecedents of behavior. It also demonstrates that there has been no direct research regarding the perceptions of responsibility for safety issues, although the issue of responsibility was often discussed. In large measure, this lack of research into perceptions of responsibility may reflect the general assumption fostered by the OSHA regulatory framework that places full responsibility for safety on management (Nelson, 2001, p. 22; Reynolds, 1997, p. 11). In addition, the literature rarely examines the distinction between responsibility and accountability, with the only discussion of the differences developing from an international perspective (Pun and Hui, 2002, p. 384).

There are a number of studies indicating that safety programs are generally more effective when employees are included in the process of hazard identification and mitigation, which implies some degree of delegation of responsibility for safety by management to employees. The inclusion of employees in the safety program development process creates a greater degree of social pressure from peers for employees to adopt a greater degree of responsibility for conforming to safety standards (Hoffman & Stetzer, 1996, p. 308). It also produces a higher degree of empowerment among

employees to identify and remedy safety problems (Barling, Loughlin & Kelloway, 2002, p. 491). Conversely, the failure to delegate some degree of responsibility to employees for safety has an adverse effect on the development of both a safety culture and a safety climate in an organization (Cox et al, 1996, p. S4). The literature further suggests that specific factors such as leadership style, organizational structure, and even the type of business the organization is engaged in can influence the decision to delegate responsibility for safety to employees by creating either an adversarial or collegial relationship between management and employees (Neal & Griffin, 2002, p. 68; Blair, 2003, p. 18).

There was a relatively high degree of agreement in the literature regarding the impact of perceptions of safety on behaviors and performance. When the workers perceive the environment as unsafe by the worker, there was higher job stress and a lower level of job satisfaction (Dana & Griffin, 1999, p. 359; McManus, 2000, p. 18). In addition, a perception of the environment as unsafe produces different behaviors that operate to increase the security of the individual (Rundmo, 1995, p. 90). In general, the literature suggests that the perceptions of safety were more controlling of behavior than the objective assessment of safety. As a result, managers tended to make a more objective assessment of safety due to their distance from the operational environment and the hazard, while employees tended to make a more assessment of safety due to their proximity to the hazard.

CHAPTER III

Methods and Procedures

Introduction

The purpose of this survey was to evaluate the perceptions of the employees regarding their role and responsibilities for workplace safety. In addition, it determined if job satisfaction, safety attitude, safety knowledge, demographics, supervision emphasis played a role in the development of attitudes towards responsibility for workplace safety. The principle method employed by the survey was the survey, which was supplemented by the development and distribution of a questionnaire to determine the nature of various factors that influence the development of perceptions regarding safety in the workplace. Additional interviews were conducted with personnel to establish qualitative opinions regarding responsibility for safety. The survey was conducted from the perspective of the alternative, which contended that there were differences in perception between management and employees with respect to workplace safety. It further adopted the perspective that workplace perception of responsibility for safety was the dependent variable, with other factors that could contribute to the perception as independent variables. It was beyond the scope of this survey, however, to test the variables for statistic correlations.

The survey method allowed for the examination of individuals and organizations in their natural setting and facilitates the identification of a wide variety of influences on behavior. A particular feature of the survey method of analyzing data was its holistic approach that attempted to identify all of the factors that interact with a situation and the responses to the situation developed internally by businesses and external environment forces. As a result of the interaction of these various and often factors, the statistics and other types of numerical information contained in the data formed only one aspect of the analysis. The value of the methodology was that it offers theoretical views about human motives and the decision-making process and the way that they impact business and the operating environment of the business. In addition, the methodology provided the input from a wide variety of sources over time, which depicted the complex economic, social and political forces that interacted with business operations. To some degree, an examination of past problems and responses to the problems helped to create a trend pattern, which could be used to forecast the most likely future events for the industry and the local economic environment. Although the survey methodology used in this survey had a quantitative component in the form of descriptive statistics, it remains a qualitative survey assessment.

This survey focused on perceptions of employees and managers regarding the primary responsibility for workplace safety. It was undertaken in a single manufacturing facility in Oklahoma that produced carbon black for industrial sale. The firm employed approximately 111 individuals, including both managerial and non-managerial workers. In addition, the firm was subject to all OSHA and state mandated safety standards, and has developed an internal metric to determine whether safety standards were being met.

Because of the characteristics of the facility under survey, it was deemed representative of similarly situated manufacturing facilities with more than 100 workers.

The research used a post-hoc design, which does not require a control group. Four steps comprised the method of the survey. They are listed as follows:

- (1) Review of the available literature and the secondary data pertinent to the problem of the investigation and variables of the survey.
- (2) Design a survey test instrument and formalize an interview format to gather data from their administration to the sample population.
- (3) Analyze, compare, and develop descriptive statistics from the recorded data.
- (4) On the basis of the results of the analyses, answer the research questions.

The literature review provided the framework for the formulation of the research questions. It also established the parameters for the development of a questionnaire to measure perceptions regarding job satisfaction, safety attitude, and related factors such as level of safety knowledge, demographics, and supervision emphasis.

Survey Questionnaire

The survey questionnaire consisted of five sections (See Appendix A). The first section measured job satisfaction and the second section measured safety attitude. The third section is extensive and measured safety knowledge. The fourth section elicits demographic information, and the fifth section determined the level of employee supervision on safety issues. The dependent variable regarding employee perceptions of

responsibility for safety was measured by the answers to several questions embedded in the test instrument that elicit information in the various areas queried by the test instrument.

The test instrument was developed through the literature review, which revealed the way in which previous researchers have operationalized the concepts of perceptions of responsibility, job satisfaction, level of safety knowledge and demographics. The test instrument was based on the assumption that reports of specific behaviors or attitudes by respondents can serve as a proxy measure for variables that are difficult to directly quantify and measure. Face validity of the test instrument was established by participating employees and managers in various positions in the workforce, and established that the constructs were understandable to the reviewers. Content validity for the test instrument was established by peer review by academics involved in the areas of business management and psychology. Criterion validity was established through a field test of the survey questionnaire to determine if the instrument was predictive and was reliable over time. Due to the constraints of the survey, criterion validity was established based on a relatively small sampling, with positive indications that the instrument was predictive, but a lower level of certainty that the instrument will be reliable over time. As a result, reliability has been estimated rather than established.

Survey Population and Sampling Strategy

The survey population consisted of 111 workers in a single manufacturing plant in Oklahoma. Participants for the survey were randomly selected (along the lines of

employees and supervisors) within the plant. Participation in the survey was strictly voluntary, with no effort made to provide any specific incentive or disincentive to encourage participation. The survey population included both employees and supervisors, with the supervisory population serving as the source of information regarding the perceptions of management regarding responsibility for workplace safety. While the total population of the plant included both salaried and hourly personnel, the survey population was limited to hourly personnel who were members of the union, some of whom were in lead positions. The plant had a relatively high retention rate for employees, with new hiring generally due to retirement attrition. Nonetheless, the tenure of the survey population was variable.

The departments of the manufacturing firm participating were Production, Maintenance and Shipping. Laboratory was excluded from the survey due to its focus on operational safety in a production environment, with laboratory safety practices deemed sufficiently different from operational practices to warrant separate research that is beyond the scope of this survey. The resulting sample population of 82 employees is shown in Figure 1.

Table 1: Sample Population and Participant Percentages

Job Title	Department			%Participants
	Production	Maintenance	Shipping	
Supervisors	2	2	0	5
Control man	4			5
Reactor Operator	8			10
Wet Process	8			10
Technician		4		5
Electrician		2		3
Welder		4		5
Repairman		6		7
Painter/Carpenter		2		3
Forklift Operator		1	3	5
Warehouse		1	1	3
Crewman		6	21	32
Building		1	2	3
Printer			1	1
Loader			1	1
Valve Packer			2	2
Total	22	29	31	100%

Of the 111 potential subjects in the study population, 9% were supervisory personnel and 91% were non-supervisory employees. Of the actual respondents to the survey, 5% were supervisory personnel and 95% were employees in non-supervisory positions (reference percentages in figure 1). All members of the survey population had participated in training that included energy control, lock-out/tag-out, respiratory equipment, personal hygiene, eye safety, emergency response, and other personal protective equipment safety programs, and were aware of safety expectations in the facility. Management allowed safety meetings to be used by researcher completing the survey in groups of 12 people attending each safety meeting and participation was on a voluntary basis. Focus groups were considered by researcher but its use denied by

management and union. During safety meetings time was allowed to complete the questionnaire without an opportunity for discussion.

Data Validity

The test instrument was field tested in a sample population of ten individuals, with five respondents asked to fill out the test instrument under normal testing conditions, and five respondents asked the questions in an interview format to provide a basis for comparison. The following measures or data sources were used to evaluate the validity of the test instrument:

(1). The item's non-response rate was low at $> 2\%$ on the respondents filling out the test instrument under normal circumstances.

(2). The results collected by written administration of the test instrument were comparable to those obtained through oral administration of the test instrument when evaluated by a mode survey.

Data Collection Procedure

The data collection process consisted of the literature review, the dissemination of survey questionnaires, and engaging when possible with respondents regarding questions. Questionnaires were completed after or during safety meetings held during a 90-day time period. The nature of the survey was fully explained to respondents during the safety meeting, followed by the distribution and collection of completed questionnaires. The

researcher was available to answer questions regarding the survey, but did not answer questions regarding the content or meaning of questions in order to minimize potential bias. The questionnaires were not signed or coded with respect to the identity of the respondents in order to preserve anonymity of, but a separate record was kept of the individuals completing the questionnaires in order to facilitate follow-up procedures. In addition, the respondents were requested to indicate whether they were in a supervisory position in order to facilitate the data analysis by segregating employees from supervisors.

The survey data were collected from May through July 1996. There were 111 questionnaires distributed, with the remaining 29 potential members of the survey population expressing unwillingness to participate in the survey. Eighty two questionnaires were completed, which resulted in a 74% completion rate. Follow-up was conducted after several meetings with individuals who had not completed the questionnaires. The follow-up took the form of a reminder regarding the questionnaire, and merely encouraged participation in the survey. Because 29 individuals did not complete the questionnaires despite the follow-up opportunity, this was interpreted as a de facto expression of unwillingness to participate in the survey. Of the completed questionnaires, 4 or approximately 5% were from individuals in a supervisory position while the remaining 78 or approximately 95% were from employees.

Data Collection for Survey Process

Additional interviews were conducted with personnel at safety meetings encouraging participation, a total of 29 participants failed to respond in completing the questionnaire.

1. During company sponsored safety meetings members were encouraged to participate in the project on a voluntary basis.
2. Managers encourage members to participate.
3. During the meetings the researcher was available to encourage participation and respond to any questions or concerns.
4. Participants' asked follow-up questions based on formal questions regarding the purpose of the survey.

The data developed by the interview process was treated as qualitative information to support, refute or expand on the findings produced by the administration of the test instrument.

Replication

Due to the objective nature of the survey test instrument and the process by which its validity was established, the results produced are replicable when the test instrument is administered in similar testing environments. Because of the nature of the interview questions and responses, the results produced by the interview process are less replicable, and may be specific to the test environment.

Data Analysis

The data analysis procedure consisted of a synthesis of the information gathered through the literature review, the dissemination of questionnaires and the conduct of participants. The data produced by the literature review provided a basic framework for the development of the research questions and an overview of theory and research findings regarding the nature of the issues that impact perceptions of safety responsibility and related factors. The data produced by the questionnaire was analyzed using a descriptive statistics methodology. The format of the questionnaire provided the basis for establishing a coding frame for the responses. Although some questionnaires included incomplete information in the form of no response to specific questions, the data from these questionnaires was included in the survey. This was based on the determination that the nature of the descriptive statistics did not require all questionnaires to be complete, with statistical findings based on the actual number of respondents to specific questions. As a result, the data produced by the survey shows some differences in the number of individuals answering specific questions. The interviews provided data regarding employee and management perceptions, which was synthesized with the data produced by the literature review and the questionnaire to provide the findings of this survey. No correlation between the data produced by the questionnaire and the data produced by the interviews was attempted. The statistical data from the questionnaire as well as the qualitative data produced by the interview was synthesized to produce the survey and findings of the research.

Chapter IV

Findings

Introduction

The findings of the survey with respect to the various research questions vary, and in some cases are contradictory to the anticipated findings based on the literature review. In general, the findings indicated that there was some degree of difference in perceptions of management and employees of responsibility for workplace safety, but that the employees accept a higher level of responsibility than anticipated from the literature review. In addition, the findings indicated that there was a positive safety climate in the facility, that the level of job satisfaction was relatively high, that the employees demonstrated a good level of safety knowledge, and that the level of supervision in safety matters was perceived by employees as adequate.

The findings of the first research question that sought to determine whether workplace safety issues impact the level of job satisfaction suggested that there may have been a connection between the reported high levels of job satisfaction and the positive safety climate and level of perceived responsibility among employees. The literature indicated that insufficient emphasis on safety or an unsafe work environment can have a negative impact on job satisfaction, with a poor safety environment increasing job stress (Rundmo, 1995, p. 88). The employees in the plant under survey had high levels of job satisfaction

as evidenced by their responses to the job satisfaction section of the questionnaire and the low employee turnover rate of the facility. At the same time, the employees indicated that they had a high level of safety knowledge and that they had full authority and support for engaging in safety practices from the management, which established a strong safety climate. While this finding of a moderately strong safety climate coupled with high job satisfaction tended to support the premise that safety issues can impact job satisfaction, there may have been other intervening factors that simultaneously contributed to the high levels of job satisfaction. As a result, the positive safety climate and high level of perceived responsibility for safety issues by employees should be viewed as a contributory but not a definitive factor in establishing job satisfaction.

With respect to the second research question regarding safety attitudes and the existence of different perceptions in management and employees with respect to responsibility for workplace safety, the findings indicated that there were indeed such differences. In general, management had a relatively low expectation of responsibility from employees for safety issues but the employees nonetheless accepted responsibility for safety issues within their direct sphere of operations. Although the findings indicated that there was a relatively high degree of acceptance of responsibility for workplace safety among the employees of the firm under survey, management tended to assume that employees would accept only minimal levels of responsibility. As a result, management adopted a policy of setting safety standards based on external requirements and did not consult with employees regarding the development of safety standards and procedures. The higher level of acceptance of responsibility for safety issues among employees may have been due to the existence of a strong safety climate established by management as

well as peer or social pressure among employees to conform to established safety procedures.

With respect to the third research question investigating whether the level of knowledge regarding workplace safety operates as a modifier for perceptions regarding responsibility for workplace safety, the findings supported the conclusion that a high level of safety knowledge contributed to a positive view of safety climate and acceptance of responsibility for safety by employees. The employees in the facility under survey demonstrated a high level of safety knowledge, and were aware of the safety policies and procedures of the organization. This finding suggests that the employees were more willing to take responsibility for workplace safety when they have a high level of knowledge, which lead to a greater degree of certainty that the action they had taken was correct and was supported by management. To some degree, the level of employee knowledge was interconnected with the safety climate of the facility, with a strong safety climate fostering the acquisition and use of safety knowledge.

The fourth research question regarding whether demographic factors function as a modifier for employee perceptions regarding responsibility for workplace safety could not be meaningfully assessed based on the data provided by the employees of the facility under survey. The workforce in this facility was relatively homogenous demographically, and was composed exclusively of men that are predominately in the same approximate age range. In addition, there was no amount of ethnic or racial diversity in the workforce. As a result, substantive differences in perceptions based on demographic factors could not be ascertained.

The findings of the survey established that there was a strong management commitment to safety in the facility under investigation, with the level of commitment creating a strong safety culture. The policies and procedures developed by management also resulted in the creation of a positive safety climate. Management established clear safety goals and used quantifiable measures to determine progress towards achieving these goals. In addition, management developed an extensive training program for employees to ensure that they acquired and demonstrated an appropriate level of safety knowledge. Management's position regarding the content of safety programs and policy, however, was based largely on the requirements established by the external regulatory agencies, with very little input from the employees that were engaged in actual operations in the facility. The facility was unionized, which tended to reduce the possibility of developing a collaborative approach to safety between management and employees despite the amicable relationship between management and the union.

The findings regarding the fifth research question regarding whether the level of management supervision of employees operates as a modifier for employee perceptions regarding responsibility for workplace safety were inconclusive. For the most part, the employees perceived the level of supervision as adequate for the task and the environment. There was a contradiction, however, in the data produced by the survey questionnaire with respect to the perceived level of commitment of the firm to safety and the perceived level of employee commitment. Despite a high level of perceived organizational and employee commitment to safety, the respondents to the survey questionnaire believed that there were excessive levels of management supervision of safety issues. This may have been due to the desire of employees to accept a greater level

of responsibility for safety, or it may have been due to a management emphasis on safety issues that were not deemed relevant by the employees.

Findings of the Survey

The findings of the questionnaire survey are contained in Appendix B. The survey test instrument was designed to measure perceptions in the areas of job satisfaction, safety attitude, safety knowledge, a section to determine the demographics of the survey population, and supervision emphasis. Questions regarding perceptions of responsibility for safety issues were embedded in the various sections of the survey questionnaire. The validity of the data produced by this test instrument was contingent on a number of factors, including the perception of employees that the employer desires accurate and truthful answers to the survey questions. In addition, the data did not attempt to determine the cause-and-effect relationship between factors that could impact safety such as safety climate and training, but rather attempted to identify the existing perceptions with respect to responsibility for job satisfaction, safety attitude, safety knowledge, demographics and supervision emphasis at a specific time in a specific place.

The job satisfaction section of the questionnaire was intended to demonstrate the overall level of job satisfaction of the respondents without direct reference to safety issues. The questions were developed from the perspective of positive satisfaction on a five-tiered ordinal scale. In effect, a lower numerical score indicates a higher degree of job satisfaction. Overall, the findings of the survey indicated that the individuals in the survey population were moderately well satisfied with their jobs. The data produced a

mean for the strongly agree position in the section of 10.6% and a mode of 10%. The data produced a mean for the agree position of 29.3% and a mode of 31%. This indicated that approximately 52% of the individuals in the survey were very satisfied with their current jobs. Conversely, there was a relatively low showing of dissatisfaction with the job, which ranged approximately 10%. There were no differences in the job satisfaction levels of employees and supervisors in the data produced from the survey instrument. The data produced by the questionnaire was supported by information from the facility under survey indicating that the organization had a very high retention rate for employees, which was also an indicator of high levels of job satisfaction.

The job satisfaction data also indicated that there were several areas in which the respondents displayed a lower level of satisfaction. These included the level of recognition that they received, involvement in the decision making process, and the opportunity for advancement within the organization. To some degree, the lower level of involvement with the decision making process may impact safety perceptions because of the belief that individual employees are not part of the way in which safety policies and procedures are established. There are other indications of a lower level of employee involvement in the decision making process derived from the supervision emphasis section of the survey, such as a moderately high negative perception of the effort made to obtain the opinions of employees, and the level of information received from management. These negative factors did not appear to have dramatically reduced the overall job satisfaction level of the employees, however, and served merely as indicators of areas in which the facility could improve its personnel management policies.

The safety attitude evaluation segment of the survey questionnaire was critical for establishing the differences in perspective between employees and supervisors with respect to safety issues. Because of the structure of the questions, the overall findings of the section cannot be computed on the basis of a mean and mode. Question 1 elicited information regarding perceptions of management and worker support for workplace safety. 46% of the respondents indicated that they strongly agreed or agreed that there was strong support for workplace safety. This finding tends to establish the perception that there is a positive safety culture and climate in the organization. All of the supervisory respondents were included in this category. As a result, there appears to be a stronger perception of support for workplace safety among supervisory personnel than among non-supervisory personnel. Question 4 elicited information regarding management response to reports of safety hazards. In this case only 44% either strongly agreed or agreed that supervisors respond well to reports of safety hazards. As with Question 1, all of the identified supervisors were included in this category. This indicated that there is a divergence of perception regarding response to safety issue reporting between supervisors and employees. Question 6 elicited information regarding supervisor attitude towards the decision of an employee to lockout a piece of equipment. 78% of the respondents indicated that they believed they would have supervisory support for the decision. Again, all of the supervisor respondents were included in this group that believed the decision would receive supervisory support. Question 8 dealt directly with the issue of responsibility and authority to lock out a piece of equipment. 93% of the respondents indicated that they believed that they had such authority and responsibility. All of the supervisors believed that they had such authority, while only 12% of the

employees believed that they did not have such authority. This finding tended to support the proposition that employees perceive that they have some degree of responsibility to take safety actions within the context of their operational tasks.

In general, the data produced by the safety attitude evaluation section of the questionnaire indicated that supervisory personnel believed that there was a greater level of attention to safety issues by them and less attention given by the employees. It further revealed that the majority of employees perceived that responsibility for safety was shared with management to some degree, as demonstrated by the very high rate of agreement with Question 6 from both supervisors and employees. This demonstrated that there was some degree of difference in perception between supervisors and employees with respect to responsibility for safety, but that the magnitude of the differences was not extremely large.

The sections of the survey questionnaire that addressed safety knowledge revealed a generally high level of safety knowledge among the respondents. Key questions in the first section of the safety survey with respect to perceptions of responsibility were contained in the section. Question 5 indicated that 71% of the respondents perceived responsibility as meaning actions that the individual was supposed to take, with all of the supervisory personnel included in this percentage. This finding was supported by the responses to Question 8, which indicated that 78% of respondents indicated that control and lockout involved the exercise of responsibility. Question 6 indicated that 86% of respondents perceived a distinction between authority and responsibility by indicating that authority is the power to decide. Question 7 elicited data on the perception of the meaning of accountability, with 88% responding that accountability was equivalent to

answerability. The remainder of the questions in the first section of the safety survey indicated that employees as well as management take a high degree of responsibility for the identification and mitigation of workplace hazards. In general, the responses to this section indicated that the employees recognized the distinction between responsibility, authority and accountability. It further suggested that the employees believed that they have the responsibility to exercise delegated authority in certain safety issues, and would be held accountable for the decision.

Section two of the safety survey focused more heavily on individual safety practices in the context of the specific facility under survey, and did not emphasize perceptions. In general, the survey revealed a relatively high level of safety consciousness among both employees and supervisors. This section provided information regarding the general level of safety knowledge among respondents, which was high, and revealed areas in which training interventions would be of benefit to the organization.

The demographic section of the survey did not provide sufficient data to draw substantive conclusions about the potential for demographics to modify the findings produced by other sections of the survey due to the homogeneity of the workforce in the facility under investigation. The demographics section revealed that the majority of respondents were seasoned workers between the ages of 36 and 55, with 73% of respondents in this category. The majority was also white, with only 20% identifying themselves as members of other racial or ethnic groups. All respondents were male. Although the survey elicited information regarding the job titles of the respondents, it was deemed beyond the scope of this survey to attempt to establish a correlation between job titles and findings. As a result of these factors, the demographics section of the survey

shed no additional light on the findings, with the possibility that demographics operate as a modifier of safety responsibility perceptions deemed inconclusive.

The section of the survey questionnaire dealing with the level of supervision emphasis revealed a generally even split between perceptions that there was too little supervisory emphasis and that the level of supervisory emphasis was adequate. This split was particularly apparent in certain areas such as the willingness of supervisors to obtain reactions and suggestion and the amount of information provided to employees, where the percentages of respondents on both sides of the issue were approximately equal. This indicated that the general leadership style of the facility tended towards the authoritarian, and may be the result of union structural barriers that create a functional gulf between management and employees. The findings in this section also revealed that the employees regarded themselves as having a high commitment to workplace safety, with 88% indicating that the commitment level was adequate and only 12% indicating that it was too little. When asked about the company's commitment to safety, however, only 66% believed that the commitment level was adequate, while 34% believed that the commitment level was too low. These two questions describe the employees' perceptions of the safety climate, and demonstrated that the employees largely believed that they had a greater level of commitment to safety than the organization. Paradoxically, the respondents also indicated that they believed that safety practices and procedures were followed excessively, with 88% indicating that they were followed "too much." To a large degree, this finding is contradictory to the perception that the employees are highly committed to safety while the firm is less committed than the employees. It suggested that the policies and procedures that the firm has put in place to enhance safety are

viewed as burdensome by the employees, but at the same time, the employees were generally appreciative of the overall safety climate of the organization. It further indicated that there may have been a difference between the objective level of commitment of the firm towards safety and the perception of the firm's employees regarding the level of that commitment.

The overall findings of the survey questionnaire serve to establish the safety climate of the organization and the general perceptions of the employees towards a number of factors. Based on the responses to the survey, the firm had established a good safety climate with a reasonable emphasis on safety practices and procedures. In addition, the respondents to the survey demonstrated a good knowledge of safety issues, which may have been attributable to training, experience, peer pressure, and the general emphasis on safety by supervisors. The respondents also demonstrated a strong level of job satisfaction, with no indications that any safety issues impinged on their satisfaction level. Finally, the survey indicated that in most areas, the employees believed that the level of supervision was appropriate, although there were several areas such as managerial response to employee input where supervisory practices could be improved.

With respect to the issue of perceived responsibility for workplace safety, the respondents as a group appeared to take a high degree of responsibility for safety. Nonetheless, there remained some degree of divergence between the perception of supervisors regarding the appropriate level of employee responsibility for safety and the employees themselves. This may have been due to the continued confusion of responsibility and accountability, despite the survey findings indicating that the majority of employees recognized the distinction. When presented with concrete situations that

required a safety action, the majority of the employees appeared willing to assume the responsibility to take the action. When presented with more abstract questions, however, the employees suggested that management should take a more active role in safety and should display a greater commitment to safety issues. As a result, the findings of the survey with respect to the issue of perceived responsibility for safety established the approximate level of perceived responsibility of employees for safety, but also identified some areas in which there was ambivalence or uncertainty regarding the level of responsibility.

Findings of the Respondents

The participants were asked the questions: (1) who do you believe has primary responsibility for safety in the plant; and (2) do you feel confident that you have enough authority to deal with safety issues that you encounter on the job. The surveys were distributed after the close of routine safety meetings, with assurances that the data will remain confidential.

With respect to the allocation of primary responsibility, all of the 82 participants indicated that they believed management had primary responsibility for safety in the plant. When questioned further, however, the majority of the participants indicated that they accepted a great deal of responsibility for their personal safety and for the safety of their coworkers. In effect, the participants cognitively recognized that management had primary responsibility for safety in the plant, but accepted a far higher level of responsibility for implementing the safety standards and policies of management. This

strongly suggested that there was a dichotomy between the principles of full management responsibility for safety as articulated by outside agencies such as OSHA and the union, and the actual practices of employees who accept a high level of personal safety responsibility. This dichotomy may have been due to the continued confusion between responsibility and accountability among the participants, despite the findings of the survey indicating that the respondents made a distinction between the two concepts. It may also have been due to the inherent conflict between the formalized responsibility allocation that is established by law and by union principles that places responsibility fully on management and the informal organizational culture that has developed, which has expectation that employees will accept a higher degree of safety responsibility.

Although it was not clearly articulated by the participants, there was a general perception among the participants that personal safety was not a matter that could be fully entrusted to management, and that their personnel security depended largely on their own actions. To some degree, this undercurrent of perception in the interview process may have been the outcome of the adversarial relationship in the facility between management and unionized workers, despite other indications that management and employees enjoyed generally amicable relationships. The employees clearly did not accept the premise suggested by some of the literature that a collaborative relationship was important for effectively addressing safety issues (Wortham, 1998, p.68; Thatcher 2003, p. 54). This was largely due to their perception that management could not be fully trusted to safeguard the interests of both the organization and the employee, and in the event of a conflict of interest, the organizational needs would take priority.

There was some indication from the participants that there was a threshold level of hazard magnitude at which responsibility for hazard mitigation shifted away from the employee and towards management. For minor or routine hazards, the employee appeared to take a very high level of responsibility. For major hazards, however, the employees expressed a willingness to engage in immediate mitigation when necessary and possible, but suggested that long-term mitigation was the full responsibility of management. The employees made no distinction between hazards that were the result of routine operations and hazards that were the result of defect in equipment or defects in process design. As a result, there was some degree of confusion regarding the respective roles of employees and management with respect to certain types of hazards that were systemic in nature and were not addressed under an existing safety procedure or policy.

When the four supervisors that participated in the survey and the interview process were asked the question regarding perceptions of primary responsibility for safety, they responded substantially similarly to the employees. Although the other employees considered these supervisors as lower level management, the supervisors were nonetheless union employees. The supervisors did express a greater degree of perception that employees should accept a high level of responsibility for personal safety and the safety of their coworkers, and appeared to have a greater understanding of the distinction between responsibility and accountability. The supervisors further indicated that they favored training and peer pressure as the best means to foster compliance with safety standards, with disciplinary procedures used only in the most egregious violations of safety rules. One supervisor expressed additional concern that senior management established some of the safety procedures and policies in response to pressure from

OSHA and tended to ignore the input of the firm's employees. This perception that many of the safety rules had no purpose and was a response to regulatory concerns rather than actual safety needs may have been the basis for the survey finding that too much emphasis is placed on safety practices and procedures in the facility.

The participants generally responded that they felt confident that they had sufficient authority to deal with safety issues. The majority of participants added some type of qualifying statements indicating that this authority was relatively limited and involved only their direct sphere of operations. They further suggested that only in some circumstances would they counsel a peer regarding the appropriate type and nature of safety practices due to the possibility that the advice would be misinterpreted as an unwarranted intrusion into the sphere of responsibility of another. Nonetheless, the employee participants suggested that there was a strong amount of peer pressure to conform to safety standards, which was viewed as a necessity to ensure that personal safety would not be endangered by the acts of another employee.

There was a generally mixed indication that employees would take it upon themselves to notify a supervisor of a safety condition. In situations in which the hazard was severe, there was less reluctance to inform supervisors and other workers of the hazard. In addition, there appeared to be a strong willingness to engage in immediate hazard mitigation procedures if necessary. For hazards that were perceived as less severe, however, the interviews showed less willingness to inform superiors or coworkers, with hazard mitigation focusing on establishing personal safety only.

The supervisor participants demonstrated a greater degree of ambivalence regarding the extent of their authority to deal with safety issues. While they

acknowledged that they had authority over safety in their sphere of responsibility, they also indicated that they believed that many matters had to be referred to senior management. In effect, they perceived that they had sufficient authority to deal with routine matters, but lacked the authority to deal with extraordinary matters. In addition, they believed that they had a strong degree of responsibility to supervise the safety practices and procedures of subordinates. To some degree, this indicated that the supervisors found the issue of safety a stressful matter, and perceived themselves as involved in an approach-avoidance conflict with respect to safety. On one hand, they felt a great deal of pressure from senior management to achieve target safety, while on the other hand, they did not feel that it was desirable or effective to micromanage the activities of their subordinates.

Employer's Responsibility for Safety

The data collection procedure elicited information regarding the perceptions of employees and supervisors regarding safety. The general environment of the facility helped to foster these perceptions, and was the outcome of the factors affecting the safety culture and safety climate of the organization. One of the primary factors in the development of management's position with respect to responsibility for safety was the regulatory oversight of the facility by OSHA, which formed the basis of the safety policies and procedures promulgated by management. This was the most important factor in establishing the employer's perception of overall responsibility for safety, which was

evidenced in the supervisory perception of the role of employees in safety implementation.

OSHA has established a regulatory framework in which management is both responsible and accountable for safety. In addition, the approach of OSHA toward responsibility is hierarchical, with responsibility delegated down the chain of management command to the supervisor level. The fundamental assumption of OSHA is that the employee does not assume any degree of responsibility for safety, with management setting and enforcing safety rules, practices and procedures. Management will not be held culpable for safety violations or safety issues only in circumstances in which the employee has blatantly disregarded safety procedures and management neither knows nor should have known of the safety infringement. This is largely based on the law of master and servant in which the employer obtains the right to dictate the actions and behaviors of the employee during the course of employment, and in return has full liability for the actions of the employee. This traditional concept largely dictates the relative positions of management and employees despite the development of more modern organizational paradigms and practices that attempts to establish a collegial relationship between management and employees.

OSHA can also intervene in cases where management takes disciplinary action against an employee for filing an OSHA complaint regarding an observed safety issue that management does not respond to. This type of action on the part of OSHA is often referred to as “whistleblower” protection, and is intended to provide safeguards for employees who report safety violations. In such cases, OSHA conducts an investigation, and if a safety issue is found, the disciplined employee is reinstated. While this type of

protection is necessary in some circumstances where management is unresponsive to employee safety concerns, it nonetheless reinforces the adversarial paradigm between management and employees with respect to safety.

Because of this formal assignment of legal responsibility to the employer, management perceived that there were limitations in the responsibility of employees towards safety. Management in the facility had to ensure that the employees did assume some degree of responsibility for actually implementing safety policy and procedures. At the same time, management had to ensure that the actions of the employees were in full compliance with all standards and procedures due to the inability of management to transfer accountability to employees charged with implementing safety practices. As a result, the exercise of the responsibility and authority of employees was kept under reasonable close management supervision through the agency of the employees' supervisors.

Although senior management set the general safety policy in the facility under survey, implementation of the policy was largely the responsibility of the line supervisor who has closest contact with the routine activities of the employees. In most cases, the supervisor had the same or superior technical skills to the employees that are supervised, and theoretically had a thorough understanding of the inherent and extraordinary hazards associated with specific tasks. At the same time, the supervisor was charged with the dual tasks of insuring that production levels were maintained while following safety policy established by senior management. The relative degree of importance that was placed on each of these two tasks by senior management largely dictates the level of perceived responsibility among employees and supervisors. In the case of this facility, a relatively

high degree of responsibility for safety issues was delegated by management to employees, which placed the supervisors in the position of insuring that the employees' properly exercised their responsibilities.

The dual tasks of production and safety were somewhat explanatory of the responses of the supervisory participants in the present survey, who indicated that they were comfortable in enforcing safety policy only in routine matters but needed additional authority for extraordinary safety issues. The facility had a strong safety climate as evidenced by the perceptions of both employees and supervisors. This safety climate appeared to empower the employees to perceive a greater degree of responsibility for safety within their respective tasks, with employees feeling an equal level of responsibility for maintaining production. The safety climate also appeared to empower supervisors to accept responsibility for the oversight of routine safety matters. When the safety issue was sufficient to potentially disrupt production for extended periods, however, the supervisor perceived that resolving the issue was the responsibility of more senior management. This suggested that the role of the supervisor in the safety hierarchy of decision-making was relatively well defined, with the supervisors recognizing the boundaries of their authority.

In the facility examined in this survey, senior management appeared to place a strong emphasis on safety issues as evidenced by the positive safety climate in the facility. In effect, senior management was highly committed to safety, which was a factor identified in the literature as a prerequisite for establishing a positive safety culture and climate (Foghrasher, 1999, p. 83). Safety issues were part of the firm's total quality improvement program, which implied that the evaluation of safety standards and the

mitigation of hazards were approached as a continuous quality control process.

Nonetheless, OSHA externally set the parameters of the way in which senior management approached safety issues, which effectively established boundaries on the types of safety programs that were established but not on the way in which they were implemented in the facility.

The plant was required by law to allow both OSHA and state safety inspectors to enter the workplace and must answer all questions and provide the inspector with any requested data. If the inspector should find a violation of a safety standard, a written citation would be issued. The inspector had the authority to determine whether the employer should be fined or warned and given time to correct the unsafe situation. The firm could be assessed a civil penalty of up to \$10,000, and managers who egregiously violate safety standards can face a criminal penalty of up to \$20,000, or a maximum of one year in prison. In most situations, however, inspectors issue warnings to encourage the firm to correct unsafe conditions. Once a warning is issued, an inspector can return to the facility without notice to ensure that the safety violations have been corrected. While employers have the right to appeal a citation or fine, the facility in this survey made a practice of cooperating with inspectors. As a result of these OSHA procedures, management in the facility placed a strong emphasis on compliance with the safety issues that had been identified by inspectors and a lower emphasis on collaborating with employees to identify and mitigate hazards that may exist in the workplace, but had not been identified by an inspector. To some degree, this created a mechanized approach to safety issues, which nonetheless was functional in improving safety due to the wide variety and quantity of safety issues addressed by OSHA.

From the perspective of management, OSHA standards include a number of administrative burdens that could be the source of a citation for failure to comply with the requirements established by OSHA. One of the more important of these administrative burdens is the “Right to Know” regulation, which is sometimes referred to as hazard communications. This regulation requires that the employer provide employees with information, which is deemed to be a positive action in furtherance of safety. Workers must be informed of the types of hazardous substances such as asbestos, cyanide or polychlorinated biphenyl’s (PCBs) that they may be exposed to in the facility. Another regulatory area that is becoming an increasing focus for the facility’s management is ergonomics (Abrams, 2002, p. 51). Under current OSHA policy, the plant must make a good faith effort to identify and mitigate ergonomic hazards, with the nature and scope of the good faith effort subject to interpretation by an inspector. Meeting this good faith requirement requires extensive documentation regarding the procedures used to identify and mitigate ergonomic hazards.

As a result of these broader safety concerns raised by the regulatory environment, management generally has a wider perception of its role in safety matters than employees. The administrative nature of many of the safety standards that require the development and implementation of a specific safety strategy and documentation of the implementation removes the safety issue from the sphere of the employee and places full responsibility on management. In effect, management must maintain a broad safety perspective that integrates the general safety status of the facility as a whole with the specifics of the actions undertaken by individual workers to ensure that safety standards are met. In the event that employees fail to comply with safety standards, or if

management fails to establish safety standards and enforce compliance, management is fully accountable. In contrast, the employees are concerned only with their immediate operational environment and the hazards of their specific tasks. While they may be responsible for compliance with safety standards and accountable to management for their safety decisions, their role in safety is inherently limited.

The management of the facility examined in this survey had developed an adequate work safety program that appeared to be effective in establishing both a safety culture and safety climate to address the broad safety needs of the facility. In addition, it had developed a training program to address the safety needs and level of safety knowledge of the individual worker. The level of commitment of management to safety was relatively high, which fostered the formation of a safety culture in which members of the organization were expected to strive towards achieving safety (Blair, 2003, p. 18). This safety climate was produced by evidence that management incorporates safety in its strategic planning process, and the continuous emphasis placed on safety matters in the supervisory process. In addition, management appeared to foster the development of a safety climate in which all members of the organization perceive that safety was a relatively high priority and were somewhat aware of their role in safety performance (Mearns & Flin, 1999, p.91). Management of the facility had established a program to meet its safety, which had the effect of creating a positive safety culture and safety climate. The program included worksite analysis, which was the review of existing facility layout to identify and mitigate hazards, and an ongoing review of the tools and equipment used in production in order to ensure that they meet safety standards. Management also provided an extensive training program with respect to equipment

operation and safety in order to increase safety knowledge and reduce the possibility of injuries due to operator error. The facility conducted an ergonomic review in order to identify and mitigate potential repetitive motion hazards. These steps undertaken by management have fostered the perception among individual workers that the facility was concerned with safety matters.

While the majority of the actions taken by management to discharge its responsibility under the law to provide a safe workplace were a result of regulatory requirements promulgated by OSHA, the management of the facility appeared to exceed the minimum regulatory requirements in a number of areas such as training and the comprehensiveness of its safety review process. Management generally indicated that it perceived improved safety as a positive contribution to higher productivity and lowered costs, suggesting that the firm understood the negative financial impact that can occur from a poor safety environment. Although management retained a high level of responsibility for the majority of safety issues, it did exhibit a willingness to share responsibility with employees with respect to implementation of safety decisions and policies. To a large degree, this delegation of responsibility to employees occurred in a similar fashion as the delegation of authority in the leadership hierarchy established in the facility, with senior management delegating responsibility down the chain of command.

One of the areas not often discussed in the literature with respect to employers' responsibility for workplace safety is the need to establish and enforce standardized safety rules in order to compensate for the behavior variables of individual employees. The perceptions and behaviors of individual employees can vary in factors such as cognitive ability, perceptual ability, motivation and alertness. In addition, there may be

some degree of variation in these factors in an individual on any given day due to external factors such as physical or emotional stress. In some situations, an employee's cognitive or perceptual ability may have been impaired due to illness or the use of alcohol or drugs, which was not readily apparent to supervisors or coworkers.

Organizational policies and procedures that are enforced tend to create the boundary parameters for safety behaviors in an attempt to ensure that the behaviors are relatively standardized and meet safety (Amparo et al, 2002, p.475).

In the facility under investigation, management appeared to assume that there was some degree of variability in the performance of employees due to individualized factors and established standardized rules of safety behavior in order to minimize the impact of variability on safety. Nonetheless, the boundaries established by these rules appeared to be relatively broad, allowing the employee a wide degree of discretion in determining a course of action within the prescribed boundaries. As a result, the employee had a high degree of responsibility to ensure that variables such as illness did not impair judgment. This also suggested that in practice, it may fall to the supervisor of the individual employee to determine if individual variables have a negative impact on safety behavior.

In general, there was no indication in the facility that management inherently attributed responsibility for an accident on the employee's acts or omissions. To some degree, this finding was not in accordance with the literature, which suggested that management has a strong tendency to attribute accidents to the failure of employees to follow established safety procedures (Hoffmann & Stetzer, 1998, p.650). The responses of the supervisors in the survey suggest that they take a neutral position regarding the initial investigation of an accident, with no predetermined attribution operating as a bias during

the investigation. This may have been the outcome of the safety culture and climate established by the facility, which appeared to place a great deal of emphasis on the identification of hazards and the development of policies and procedures to mitigate the hazard. In effect, management appeared to recognize that the occurrence of an accident was potentially rooted in multiple causes, some of which may be the standards and practices established by management.

Employee's Responsibility for Safety

Despite the legal and traditional approach to safety that places full responsibility on the employer for insuring that the workplace was safe and for enforcing safety standards, there was increasing evidence that the cooperation of the employee was necessary in order to achieve the objective of maximizing safety in the workplace (Cox et al, 1998, p.S6). This was based on the recognition that the employee was not a blind instrumentality of management, and that the employer had valuable data regarding the nature of operations and safety practices that should be shared with the employer. In addition, the behavior of the employee was the product of the employee's attitudes and beliefs regarding workplace safety, which were influenced by a wide variety of factors some of which were under the control of management. As a result, much of the more recent studies and discussions of the role of employees in safety indicated that the employee should not only be responsible for implementing safety practices established by management, but should also be involved in establishing the practices and procedures

that would result in compliance with safety standards (Wortham, 1998, p.67; Thatcher, 2002, p 53).

The data provided by the literature review indicated that employees tend to accept a greater degree of responsibility for safety when the organization has established a transformational leadership-style that encourages the empowerment of employees to participate in the decision-making process (Hoffman, Morgeson & Gerras, 2003, p. 171.). There is relatively little evidence that the facility examined in this survey has generally adopted this type of leadership style, with management established in a hierarchy with authority delegated down the chain of command. To some degree, the more authoritarian leadership style of the organization may have been the source of the perceived limitations on authority to resolve safety matters by both employees and supervisors. The employees perceived that their authority extended only to resolving immediate safety issues in their direct sphere of operations. Similarly, supervisors perceived that they have authority to resolve only a limited range of routine safety issues, which indicated a limited situational leadership style among line supervisors. In effect, senior management had not adopted a leadership style that fully granted authority to subordinates to resolve all safety issues without reference to a superior in the chain of command. The lack of objective authority to resolve these issues fosters the perception among employees that they had only a limited amount of responsibility for safety issues, with the majority of responsibility remaining with management.

Despite these general indications that the facility operated primarily with authoritarian leadership, there were also some indications that the leadership style exercised with respect to safety issues was somewhat transformational in that it allowed

the employees a wide degree of latitude in implementing safety procedures within their direct sphere of operations without prior consultation with supervisors. This was a contradictory finding, and indicated that the style of leadership may have been situational in that it varied in accordance with the specific circumstances. The use of situational leadership styles by more senior management further complicated the perceived roles of supervisors, and could potentially lead to uncertainty regarding the proper course of action. Although the supervisors examined in this survey evidenced the same high levels of job satisfaction as the employees, uncertainty with respect to the appropriate leadership method to implement safety policy could lead to higher levels of stress and lower levels of job satisfaction. The supervisor sampling in this survey was very low, and the finding of job satisfaction similar to that of employees may have been anomalous.

The fact that the facility had established a strong safety climate tended to counterbalance this perceived limitation on responsibility as a result of the authoritarian leadership style of the organization in general and the exercise of situational leadership when dealing with safety matters. The data produced by the literature review indicated that a strong safety climate had a positive influence on positive safety behaviors by fostering a greater degree of awareness and concern with safety issues (Neal & Griffin, 2002, p. 68; Barling, Loughlin & Kelloway, 2002, p.489). Because there was a strong safety climate at the facility, employees exhibited a greater degree of awareness for safety matters than they would if the safety climate were weak. While the findings of the present survey suggest that the employees perceived some degree of responsibility for safety matters, it nonetheless did not establish a direct connection between safety climate and perceptions of responsibility. It may have been inferred from the findings, however, that

some environmental factors in the facility such as safety climate contribute to the attitudes and beliefs of the employees regarding their responsibility for safety. Thus, safety climate appeared to be one of the factors that fostered the development of a higher degree of responsibility for safety matters among employees.

With respect to the specific issue of the lockout of a piece of equipment before engaging in repairs or adjustments, the employees of this facility perceived that they had the responsibility and authority to proceed with lockout on their own initiative. The majority of employees indicated that the equipment had been designed for easy lockout, and that management wanted the lockout procedure used even if it disrupted production. At the same time, the majority of employees believed that they would be held accountable for the lockout decision, and must justify the decision to supervisors. In addition, if the employee failed to lockout a piece of equipment and was injured as a result, the employee was held accountable for the decision.

These perceptions regarding lockout practices indicated that within their sphere of operations, employees perceive that they had a high degree of responsibility for safety matters and the authority to engage in safety practices without prior consultation with supervisors. In effect, the facility recognized that supervisors could not functionally discover and determine the safety needs of all facets of operations and the employee that was engaged in operations must make safety decisions. At the same time, the employees were willing to accept the responsibility for personal safety, along with some degree of accountability. The boundaries of the level of responsibility and accountability for employees, however, were established by management and extended only to the area that the employee is directly involved with. As a result, if the employee became aware of a

larger safety issue that extended beyond the employee's immediate area of operations, the employee did not have the responsibility or authority to deal with the issue. Based on the responses to the survey questionnaire and information gathered in the interview process, it was unclear whether the employee perceived that they had the responsibility to communicate information regarding the safety issue to supervisor.

The findings that employees had a high degree of responsibility for safety in their immediate operating area tended to confirm the assertions in some of the literature regarding the causal connection between a high level of employee responsibility and a good safety record (Cox et al, 1998, S6). The facility enjoyed a good safety record as determined by the various metrics used to measure progress towards the achievement of safety. In effect, the employees at this facility perceived that many safety practices and procedures were within their control, although senior management determined the standards for behavior and the nature of the practices. This suggested that the range of control necessary for employees to perceive that they are responsible for safety involved the authority to carry out the recommended safety practices. The employee in the facility tended to assume responsibility when they perceived themselves having the authority to carry out an action when operating in an environment taking safety actions as necessary. In addition, the repercussions to the employee for an error in judgment on the side of safety that resulted in a disruption to production appeared to be minimal.

In general, the findings of the survey suggested that there was a lower tendency among employees to attribute accidents to management, and rather to attribute some accidents to internal and personal factors. The survey responses indicated that employees perceived that they had a high level of responsibility for safety in their personal sphere of

operations having the authority to mitigate hazards when necessary support this conclusion. Because the employees are responsible for personal safety, an accident was viewed as the failure to meet this responsibility. To some degree, this finding was not in accordance with the literature, which indicated that employees tended to attribute accidents to management's failure to identify and mitigate hazards (Hoffmann & Stetzer, 1998, p.650). It was, however, beyond the scope of this survey to determine the threshold point at which employees' perceived responsibility for safety fully shifting onto management, which can potentially occur when systemic flaws or mandated procedures are inadequate to fully mitigate hazards. In addition, the survey did not directly ascertain the relative degree of management or employee attribution for accidents.

Strategic Planning and Change Management

At the facility under survey, strategic planning was an integral part of senior management's role and incorporated safety aspects, which were deemed a necessary component of the facility's overall strategy. The strategic perspective of the management appeared to view safety as a necessary factor in achieving competitive advantage. This was based on an understanding of the direct and indirect costs associated with a poor safety climate that include higher insurance premiums, workforce retention costs, lost production time, and the possibility of fines from safety enforcement agencies. In addition, a poor safety climate was viewed as having the potential to become a union issue, which could contribute to union actions such as strikes and work stoppages that could reduce productivity and profitability. The general approach to the strategic

planning process and establishing goals and tended to follow the traditional pattern of determining the desired end state, obtaining information on the best means to achieve the desired end state, and communication to the individuals responsible for insuring progress towards the end state (Blair, 2003, p. 18).

The output of the strategic planning process for the facility was a number of goals and that employees were expected to achieve in both the short and the long term. While the majority of the organizational goals dealt with productivity or financial issues, at least one objective was generally devoted to safety. The facility used a metric measure to gauge progress towards the goal, which took the form of the number of days without an accident, and the total number of reportable accidents that occur in a given period of time. In the context of the way in which the facility was managed, the metrics provided managers with a reference point regarding the effectiveness of their safety programs. This type of metric was used as a management tool at all levels, including the supervisory level. In practice, the supervisor was expected to minimize the number of reportable safety incidents, with evaluations of the supervisor impacted by the ability to meet or exceed the safety goal set by senior management. The safety goals of the organization did not appear unreasonable, and were evaluated on a regular basis to ensure that they remained relevant.

The use of metrics in order to evaluate safety had the potential drawback that the metric becomes the focus of all safety programs rather than the development of programs that foster safe behaviors (Sheehan, 1999, p.41). Although this possibility existed in the facility of this survey, there was substantial evidence indicating that the organization was equally concerned with the actual safety behaviors of individuals. The relatively high

level of training as well as the general awareness of safety policy and procedures among employees indicated that a safety culture and climate existed, and that the measures showing progress towards achieving safety goals did not eclipse the emphasis on appropriate safety behaviors. In effect, management recognized that there was a direct connection between the actual behaviors of individuals and achieving the goals set by management.

One of the shortcomings of the strategic planning process as it was used in the facility was the relatively low level of input from supervisors and employees with respect to safety. The planning process was primarily concerned with complying with the safety standards and procedures that had already been identified by OSHA. As a result, it was largely a reactive process that dealt with existing safety matters rather than a proactive process that sought to identify safety issues before they result in an accident or a citation by an OSHA inspector. The literature indicated that the structure of the organization can have an impact on the ability of employees and supervisors to participate in the planning process (Zoller, 2003, p. 120). In addition, manufacturing facilities tend to function with a more hierarchical and authoritarian relationship between management and employees when compared to other types of businesses. This may have been partially due to the more adversarial atmosphere that was created when employees were represented by unions regardless of the level of amiability that existed between management and the unions. The fact that a plant was unionized tended to perpetuate the traditional, and somewhat archaic organizational structure in which there was a gulf between the roles and of management and employees. These factors appeared to control the degree of participation of employees in the planning process in the facility under survey. The result

was the more reactive stance of management to safety planning in which senior management dictated policies and practices without an amount of input from employees and line supervisors.

The functional exclusion of employees from the planning- process, however, did not appear to have impacted the creation of a positive safety culture and climate at the facility. This suggests that safety culture and climate was largely the product of management actions, and did not require a high level of employee input to foster their establishment. By demonstrating commitment to safety and by establishing and enforcing safety rules and procedures, management had direct control over the safety culture and climate in the organization. The employee's attitudes and beliefs, which were the antecedents of the employee's behavior, were partially shaped by this culture and climate.

Because establishing and maintaining safety standards is an ongoing process, it inherently involves the management of change. As new production systems were developed and deployed in the facility and as the safety defects in existing systems were discovered, management was faced with the task of continually updating policies and procedures to reflect changes in the environment or the acquisition of new knowledge. As a result, both management and employees were involved to a high degree with implementing change to safety practices. In large measure, the facility's safety culture and climate appeared to create some degree of stability for this process of frequent changes to safety policy and procedures. Both management and employees recognized that some degree of ongoing change was necessary in order to improve safety standards and practices. This conclusion appears to be in accordance with the findings of the

literature in which the organizational value structure shapes the way in which members of the organization accept change (Kabanoff, Waldersee & Cohen, 1995, p. 1079).

Based on the theoretical premise that organizations display various dimensions of values, the facility examined in this survey appeared to primarily use authoritative, commitment, and reward values during its process of implementing change (Kabanoff, Waldersee & Cohen, 1995, p. 1077). The authoritative dimension created an expectation among employees that senior management would establish and enforce safety standards, with the understanding that it was the responsibility of the employee to follow the standards developed and promulgated by management. At the same time, the organization had a strong cultural value of commitment, with the expectation that employees would be committed to achieving organizational goals, and that the organization was committed to improving safety. In addition, there was some evidence that the organization also employed a reward system at least at the level of the line supervisor through its evaluation system that emphasized the benefits of achieving corporate goals such as progress towards achieving measurable safety goals. In general, the facility could have been classified as a leadership-oriented organization in which a strong authoritarian leadership emphasized achieving organizational goals and conformity to organizational culture.

In this context, change was approached as an integral facet of organizational culture, with change as an ongoing process rather than a one-time event. The authoritarian dimension of the organization attempted to minimize resistance to change while the reward dimension of the organization tends to reinforce the benefits of compliance with the new policy or procedure. At the same time, some of the information

obtained in the interview process indicated that the employees appeared to be willing to accept change in the area of safety as long as they perceived that they would derive a direct benefit from the process.

In many respects, there were organizational factors that are beyond the scope of the strategic planning process and were the outcome of factors such as tradition and organizational structure that influence the development of the overall culture of the organization. Strategic planning attempted to shape the behaviors of the members of the organization as well as the culture of the organization as a whole through a conscious planning process. It functioned by gradually altering the direction of the organization over time, moving it towards the articulated in the strategic plan. Its effectiveness with respect to safety was largely dependant on the existing safety culture of the organization, which could be gradually altered through the implementation of a large number of safety initiatives.

Training and Safety

In order to implement the strategic plans of the organization with respect to safety, employee training in the facility under survey was regarded as an important component of the overall safety program. To some degree, the emphasis on training was in response to OSHA requirements mandating that employees receive safety training. Supervisors generally received a greater amount of safety training than employees because of their wider range of responsibilities. Nonetheless, all employees at the facility had received safety training that was well documented in order to provide evidence of compliance with the requirements for employee training. The effectiveness of the training

program was evidenced by the relatively high level of safety knowledge among the employees as demonstrated by their responses to the safety knowledge sections of the survey questionnaire. There were also indications in the facility that the content of training was constantly evolving in response to new standards or regulations imposed by OSHA or developed by management in response to equipment changes. As with other segments of the safety planning and implementation process, employees had a relatively low level of input regarding the content of training. In some situations, however, employees could influence the content of training through identifying certain procedures or situations that require clarification.

The training programs as conducted by the facility in this survey appeared to embrace the traditional safety education paradigm, which contends that increased levels of knowledge is one of the factors that shape attitudes and beliefs and thereby influences safety behavior. By insuring that the employees had a high level of safety knowledge, they appeared to adopt a more positive attitude towards assuming responsibility for safety due to a higher degree of certainty that their course of action in response to a perceived hazard was correct. In addition, the higher level of knowledge tended to create a greater degree of awareness of safety issues, which facilitated the recognition of potential hazards. As a result, training in the facility produced long-term modifications of behavior that raised the level of overall safety in the facility. As such, it can be considered as one of the more important factors that shape attitudes and beliefs, and thereby produces changes in behavior to conform to safety standards.

The primary goal of training in the organization under survey was to improve organizational effectiveness, with safety training intended to raise the level of knowledge

among workers regarding safety issues and reduce the losses to the organization due to accidents. In the development of its safety- training program, the facility engaged in some degree of assessment of training requirements, which included the requirements for skills and knowledge established by OSHA and a rough assessment of the existing skills and knowledge level displayed by the employees. The training programs that resulted from this assessment process were largely factual in nature, and attempted to increase the level of knowledge of the employees regarding safety procedures and the harm that can occur from the failure to follow safety practices. The actual training protocols appeared to be based on the underlying assumption that the employees recognize the need for safety and that they were willing to assume some degree of responsibility for insuring that safety standards are met. The training program also was a source of information for management and supervisors regarding the level of resistance to change demonstrated by employees when a new safety standard or procedure was introduced.

Safety training in the facility was a formalized process in which the employees were required to attend safety meetings. Various aspects of safety issues were presented at these meetings, largely in accordance with the training guidelines established by senior management and the OSHA compliance officer. As a result, the content of the training was largely dictated by the requirements of the regulatory bodies. There was some opportunity for the employees to provide input regarding training issues that may be of concern to them, with the specific items incorporated into the agenda of future safety training meetings. The responsiveness of the training program to these employee concerns was largely contingent on the facility's safety compliance manager, who controlled the content of the training programs.

Supervisors were expected to obtain supplementary safety training, which largely focused on the management of personnel from a safety perspective. There was no formal curriculum for supervisors, with much of the supplementary training accomplished through outsourcing. In most cases, the supervisors relied heavily on personal experience in the identification and mitigation of hazards as well as the training programs that were offered to employees. This system represented a shortcoming in the facility's training process, and could result in variability in the level of safety knowledge among supervisory personnel. Although the supervisory level respondents to the survey questionnaire demonstrated a level of knowledge equal to or superior to that of their subordinates, the structure of the supervisory training system created the possibility that some supervisors would not be adequately prepared to meet their safety responsibilities.

While it was beyond the scope of this survey to establish a definitive correlation between training and factors such as safety climate, the high level of attention that the facility paid to safety training was likely to be contributory to the generally positive safety climate. This conclusion corresponds to the assertions in the literature that training is one of the important components in establishing a positive safety climate because it helps to shape the perceptions, attitudes and beliefs of the individual members of the organization (McManus, 2000, p.18). From this perspective, training is not only important in its own right by increasing safety knowledge and awareness, it also contributes to the perception among employees that management is committed to safety and that the organization as a whole is concerned about the safety of individual workers. As a result, training also appears to contribute to job satisfaction, which was relatively high at this facility.

Perceptions of Supervisory Emphasis

The findings of the survey questionnaire as well as the statements made during the interview phase of this survey indicated that the employees perceived the level of supervisory emphasis as generally satisfactory. The personal opinion supervision emphasis survey is referenced in Appendix B. The highest level of agreement regarding the appropriate level of supervisory emphasis was focused on the quality of work. As a result, the employees of the facility perceived that the organization as whole was very concerned with the quality of their work, and that this area received an appropriate amount of supervision. There were also indications that cost and scheduling were areas that the employees perceived were high areas of concern for the firm. These were the general areas that represented the level of emphasis on production.

In the context of safety in the organization, the requirements of production such as quality of work, cost, and scheduling must be balanced against the need to engage in safe production procedure. The survey questionnaire indicated that there was also a showing that employees perceived a generally strong commitment to safety in the facility and in some cases an excessive level of supervision regarding safety matters. This suggested that the employees perceived that the organization maintains an appropriate balance between the needs of production and the demands of safety, although the concern for production was rated slightly higher than the concern for safety.

The level of supervisory emphasis in other areas such as employee feedback was relatively low, however, which corresponds to the other findings of this survey demonstrating that the facility operates with a hierarchical and largely authoritarian

leadership style. In effect, management largely ignores factors such as the development of employees as well as their reactions and suggestions. While this situation did not appear to have had a negative impact on safety or on job satisfaction, it nonetheless remained a personnel management factor that could have an adverse impact on operations over the long term. To some degree, it also underscored the practice of management of setting safety standards and priorities solely based on the requirements of outside organizations, which overlooked the potential input of the employees that are actually involved with line operations. This suggests that management within the facility does not fully view employees as an important resource that can contribute to the development of safety standards and practices.

Summary of Findings

The findings of this survey indicate that there were differences in the perceptions of management and employees with respect to responsibility for workplace safety in a manufacturing environment, but the differences were not of the magnitude that was anticipated. Management accepted the overall responsibility for safety in the facility, which was mandated by law and supported by tradition. As a result, management established the safety policy agenda that produces the safety culture and safety climate in the organization. In the case of the specific facility under survey, this safety culture and climate was positive. Management also established the training protocols, the existence of which was mandated by law, but the content of which was discretionary. Management further delegated some degree of responsibility and authority to supervisors and employees to take actions in furtherance of the safety policy established by the

organization. In this delegation of responsibility, management had the expectation that the employees would be responsible for their personnel safety and have the authority to follow safety procedures such as the lockout of equipment. Management nonetheless had the perception that it remained responsible for safety in the facility.

The employees in the organization had a broad perception that management was responsible for the overall safety program at the facility, but that they have a relatively high degree of personal responsibility for their own safety. This did not indicate that the employees accept full responsibility for safety, but rather that the respective roles of management and employees were well defined. In addition, the perception among employees that they have some degree of responsibility for safety did not alter their perception that management remains responsible for safety, which created a perspective of concurrent responsibility for safety with the employee exercising a lower level of responsibility for safety when compared to management. There was no indication that there was an attribution bias among employees, with a greater tendency to evaluate accidents on an objective basis.

The findings of the survey tend to support the contention that a positive safety climate and employee perceptions that accept some degree of responsibility for workplace safety foster a higher level of job satisfaction. Job satisfaction, however, was contingent on a wide variety of tangible and intangible factors such as pay scale, recognition, and work group cohesion as well as the perceptions of safety and responsibility for safety. As a result, the finding should be interpreted with caution due to the possibility that other factors have intervened to create a high level of job satisfaction.

The findings indicated that the employees in this facility had a high level of knowledge regarding workplace safety. This suggested that the level of knowledge was a contributory factor in the employee's perceptions of responsibility for workplace safety. The higher level of knowledge tended to foster a greater degree of awareness regarding safety issues and a higher degree of certainty that specific actions taken by the employee would produce a safe condition. In addition, the findings indicated that there was some degree of connection between the level of supervisory emphasis on workplace safety and the perceptions of responsibility among employees regarding workplace safety. The level of supervisory emphasis was related to the safety culture and safety climate of the organization, with stronger safety emphasis by supervisors and management producing a greater awareness of safety among employees and reinforcing the parameters for the assumption of responsibility by employees for safety.

CHAPTER V

Overview, Summary, Conclusions, and Recommendations

Overview of the Survey

This survey investigated the perceptions of responsibility for workplace safety among employees and management in order to determine if there was a variation in perception and if the variations produced an impact on job satisfaction. It further established whether the level of supervision emphasis impacted perceptions of responsibility for workplace safety. In addition, it evaluated the level of worker knowledge regarding safety issues and determines if there were demographic variations that impacted perceptions of responsibility, job satisfaction, and levels of worker knowledge of safety issues and protocols. The research was performed by means of a survey methodology supported by the use of a survey questionnaire test instrument. The research was conducted in a manufacturing plant with approximately 100 employees located in Oklahoma, designated as the “XYZ” company to support confidentiality. This facility was selected due to its characteristics, which typify manufacturing firms with 100 or more employees that were engaged in consistent efforts to meet state and federal safety compliance standards.

The data produced by the test instrument provided the basis for establishing correlations with respect to the research questions posed by the survey. The research

followed the survey methodology, which was deemed the most appropriate method of examining the complex nature of the interactions in the actual operational environment of XYZ. The survey questionnaire contained sections to elicit information on perceived responsibility of workplace job satisfaction, safety attitude, safety knowledge, demographics, and supervision emphasis in the context of the organization. The survey questionnaires were presented and explained to the employees of XYZ during safety meetings, with all employees present at these meetings participating in order to minimize selectivity bias. The data that it produced was the source of descriptive statistics regarding the attitudes and actual behaviors of the employees in the organization.

Summary of the Survey

This survey examined perceptions of safety responsibility among employees in a single manufacturing facility, and used the survey methodology supplemented by the use of a survey questionnaire and interviews. The survey was intended to answer specific research questions involving the differences, if any, between perceptions of responsibility of management and employees for safety, and the impact of the variables of job satisfaction, training, demographics and supervisory emphasis on safety on these perceptions. The survey proceeded from the perspective of the alternative contended that there are differences in the perception of safety responsibility between employees and management, which was supported by the general findings of the survey. While there was a quantitative component to the data produced by this survey, it was largely a qualitative assessment of the way in which the specific organizational practices and policies

interacted with employees' perceptions regarding their responsibility for workplace safety. The data produced from the administration of the questionnaire and the conduct of interviews was synthesized with observational information about the firm and the theoretical tenets revealed in the literature review to form the basis of the survey.

Conclusions of the Survey

The conclusion of the survey was that there were differences in the perception of employees' responsibility for workplace safety between management and employees, but the magnitude of the differences in perception largely depends on the organization's approach to safety. Management was objectively responsible for the overall safety of operations in the facility, but took steps to establish a positive safety climate and culture in which employees were willing to assume a greater level of responsibility for safety. These steps included management commitment to safety, training programs that increased employee knowledge of safety protocols, and a consistent pattern of supervisory emphasis on safety. In addition, management adopted a leadership style with respect to safety matters that empowered the employee to accept some level of responsibility for safety. Management also adopted a non-attributive position when investigating accidents, examining the incident from an objective point of view that did not inherently seek to establish employee blame. These steps taken by management were consistent with many of the recommendations found in the literature for creating an environment to improve safety and to encourage employees to take a greater degree of responsibility for safety matters. Management nonetheless perceived itself as fully responsible for safety, with the employees operating as instruments that carried out the policies established by management. In effect, management perceived itself as delegating

some of the responsibility to employees for safety, but retaining accountability, command and control authority.

From the perspective of the employees, the perception that they had responsibility for safety was the result of a large number of factors that were contingent on the organizational environment established by training and management support. In addition, the employee perception that they have responsibility for safety was fostered by peer pressure, which created an informal expectation that the employee would be responsible for personal safety and would not engage in any actions that endanger coworkers. Employee perception of responsibility for safety was also contingent on the level of safety knowledge among employees, which functioned to create a greater degree of certainty that a specific safety action was both justified by circumstances and authorized by management. Despite the assumption of some degree of responsibility for safety, the employees continued to acknowledge that management retained full accountability for safety matters.

The survey further revealed that there were relatively well- defined roles for employees with respect to responsibility and the authority to engage in safety-related actions. While these roles were not formalized in the form of a job description or other type of document, the organization nonetheless developed a functional system in which there were expectations that employees would behave in a manner consistent with safety procedures. As a result, employees perceived that their assigned tasks included an assumption of some degree of responsibility for safety, with their role in safety matters including the determination of safety status and the ability to lockout a piece of equipment without prior consultation with a supervisor.

Effects of Organizational Factors on Safety Perceptions

The employees of the facility examined in this survey demonstrated a perception that they were responsible to a high degree for safety within their personal sphere of operations, but that this responsibility was subordinate to and concurrent with the responsibilities of management to provide a safe workplace. To a large degree, this perception was based on a low level of trust that management could effectively provide for the personal safety of employees without the cooperation and involvement of the employee. In the specific context of this facility, the employees perceived that they were sufficiently empowered by management to take specific safety actions, but that they would be held accountable for their decision. There was no evidence that this accountability factor created a chilling effect on the willingness of the employee to take appropriate safety action, which appeared to have been due to a reasonable stance by management when a safety action disrupted productivity. There was also evidence that the employees did not contribute to the formation of safety policies and procedures, but rather operated as the instrumentalities of management in carrying out existing policy and procedure.

The perception of management with respect to employee responsibility for safety differed from that of the employees in the approach to establishing policy and procedure. While management had the perception that employees would be responsible for carrying out safety policy, it fully recognized that ultimate responsibility for safety rested with management. To a large degree, management appears to have a hierarchical perception of responsibility rather than the concurrent perception of the employees. This perception

appeared to be the result of external influences on management from the OSHA regulatory framework that placed full responsibility for safety on management and the union that sought to minimize employee accountability for safety issues. There was no evidence, however, of an attribution bias in management that sought to place blame for accidents on employees.

There was considerable evidence obtained from the survey test instrument, interviews and the general review of the facility's operations that there was a strong and positive safety culture and climate in the organization. The displayed level of commitment of management to safety established a positive safety culture. Management's emphasis on safety and the development of extensive safety training and established safety policies and procedures also fostered the development of a strong safety climate, which was perceived by the employees. The safety culture and safety climate appeared to increase the willingness of employees to accept some degree of responsibility for safety issues in their personal sphere of operations, and contributed to the perception that they had the authority to take appropriate safety actions. As a result, management's effort to create this safety culture and climate was one of the factors influencing the safety perceptions of employees.

Although training was one of the important components of the overall safety culture and climate in the facility, it also operated as an independent factor influencing the safety perceptions of employees. Management established the content and frequency of the training program in the facility based on both external requirements of OSHA and their internal assessment of training needs. Employees had minimal input into the development of the training curriculum. Nonetheless, the training program appears to

have produced a generally high level of safety knowledge among the employees and a perception that employees had the responsibility and authority to take appropriate safety actions in accordance with established policies and procedures.

The findings that the employees had a relatively high level of job satisfaction was a contributory factor to perceptions regarding safety, although there was evidence that safety perceptions and job satisfaction may have a circular relationship. High levels of job satisfaction can be produced by a wide variety of organizational factors such as pay and benefit scales, degree of autonomy in the work process, and the general environmental conditions of the facility. A positive safety climate can contribute to high levels of job satisfaction by reducing job stress that may result from safety concerns. At the same time, a generally high level of job satisfaction that may be produced by other factors can contribute to positive perceptions of safety. This occurs when the employee feels a high level of confidence to assume responsibility for insuring personal safety. Conversely, a poor safety climate in which there is a perception of danger in work activities can reduce overall job satisfaction. Based on the overall operations of the facility examined in this survey, the positive safety climate appeared to contribute to high levels of job satisfaction, but was not the only or controlling factor determining the level of satisfaction.

The level of supervisory emphasis on safety was the final factor for which the survey produced evidence that it influenced employee perceptions of safety. The organization controls the level of supervisory emphasis as the result of the general leadership model that is adopted, and its perception of the level of supervision that is necessary in order to achieve organization. In the facility examined in this survey, the

leadership style was generally authoritarian, with relatively little evidence that managers or supervisors exercised situational or participatory leadership techniques. This was supported by the indications from supervisors that they had to seek input from more senior managers when faced with a non-routine safety situation. Despite this overall leadership style in the organization, with respect to safety issues there appeared to be some degree of transformational leadership that empowered employees to make safety related decisions in their area of personal responsibility. To some degree, this use of transformational leadership for the specific purpose of establishing a safety climate corresponds to the recommendations of the literature, which indicates that this type of leadership style is optimal for fostering a positive safety climate (Barling, Loughlin & Kelloway, 2002, p.489).

To some degree, the employees' perception that there was excessive supervisory emphasis on some safety practices and procedures in the facility under survey appeared to be the result of the external framework for safety policies created by OSHA. In this framework, the content of the practices and procedures adopted and enforced by management are dictated by the concerns of an external regulatory body, and often reflect generalized safety issues that may not be safety issue in a specific facility. As a result, enforcement of these generalized safety issues created the perception among the employees that many of the practices and procedures were not necessary. This perception, however, did not appear to represent a major factor in determining the safety climate or in influencing the overall perceptions of employees towards responsibility for safety issues. It did, however, provide some degree of additional explanation regarding

the reluctance of management to incorporate employee feedback and suggestions into the development of safety protocols.

The theoretical data for this survey indicated that the actual behaviors of individuals were governed by their attitudes and beliefs, which can be modified by a wide variety of and objective factors such as knowledge, peer pressure and previous experiences. One of these factors that was somewhat under the control of the organization under survey was the response of the organization to safety issues, which was one of the elements that contribute to the past experience level of the employees' and therefore contributes to their perceptions of responsibility for safety issues. The data obtained in this survey indicated that the relatively unbiased approach to safety issues by both management and employees contributed strongly to the collective experiences of the employees regarding the existence of a positive safety climate. This was supported by the low levels of employee attribution of the cause of accidents to management's failure to meet its safety responsibilities. The past experience of the employees in the organization also contributed to the majority perception that the company was adequately committed to workplace safety.

The data produced by the survey further indicates that the facility had a structured method for managing change, with changes to safety practices and procedures included in the method. The general approach to management of change included an assessment of the required changes, the development of a training protocol to instruct employees on the nature and scope of the changes, and some degree of identification of potential resistance to change. The data also indicated that the organization generally uses a top-down approach to change, with no indication that employees are involved with the planning

process for change. In addition, the data indicated that the stimulus for change in the area of safety was both external in the form of new or altered regulatory requirements and internal in the form of the failure to demonstrate progress towards achieving safety goals.

Implications of the Survey

Because effective safety in a manufacturing facility requires the cooperation of management and employees and some degree of assumption of responsibility by employees, the findings of this survey have implications for the way in which management develops and implements safety programs. The survey has demonstrated that employees are willing to assume some responsibility for safety at least within their direct sphere of control, even in an environment which is characterized by a generally authoritarian leadership style and the presence of a union. The elements necessary to foster the acceptance of responsibility among employees include the existence of a strong safety culture and positive safety climate, an adequate level of knowledge among employees regarding safety issues, and the grant of authority to employees to take the necessary actions to ensure that working conditions are safe. As a result, the survey provides an outline of the broad principles that an organization must adopt in order to encourage the assumption of safety responsibility by employees. To some degree, the findings of the survey have implications for all organizations in that it establishes the broad prerequisites for enhancing the perception of employees that they are responsible for safety. In effect, the identified factors can be applied to organizations engaged in any type

of business activity because they are generalized. As I examined this project this is how it fits together:

1. Attitude and behavior is dependent upon knowledge of correct procedures and having accurate assessment of the results of not following the procedures.
2. Past life experiences are factors which help define variability in attitude about workplace safety. Past accident experience was not a factor in this survey.
3. Social interactions help explain the variability in the performance of safety behaviors in the workplace.
4. Physical factors in the workplace explained only a small part of the variability in attitude toward workplace safety.
5. Perceptions of supervision emphasis indicate a large degree of emphasis for workplace safety.
6. Obviously, training and safety knowledge for everyone is a contributing factor for accident prevention in the workplace.

Recommendations for Future Research

Because the present survey employed the survey methodology and descriptive statistics regarding employee perceptions of responsibility for safety, future research should attempt to establish more definitive correlations between perceptions and the factors such as safety climate, training, job satisfaction, and supervisory emphasis. The

findings of this survey indicated that a large number of factors contributed to the development of perceptions of responsibility among employees. The findings, however, did not demonstrate the respective weight that each of these factors may have in shaping perceptions. In addition, it did not use a control group to determine the impact, if any, that a decreased level in these factors would have on perceptions of responsibility. As a result, future research should focus on larger samplings that involve more than one organization, with the organizations displaying different characteristics such as a positive or negative safety climate. The data obtained from such research should be analyzed through the use of inferential statistics in order to empirically determine the existence of correlations between factors that impact attitudes and beliefs and the actual perceptions of employees with respect to responsibility for safety.

In addition to the factors identified in this survey as influencing employee perceptions regarding responsibility for safety, future research should investigate the potential that there are additional factors that can potentially exert similar influences. This area of research should particularly focus on the process of formation of employees' attitudes and beliefs regarding responsibility to determine if external influences, internal influences or a combination of both tend to foster or detract from perceptions regarding responsibility for safety. Such a determination would be of benefit in the design of intervention programs intended to alter attitudes and beliefs among employees that produce negative safety behaviors.

This research has shown how factors other than knowledge impact on behavior in industrial settings in the area of workplace safety. Since it appears that models already proposed for predicting behavior are applicable to workplace safety, the need exists to do

more definitive research in the areas of model learning, the effect of periodic safety training and safety refresher courses, and cues to action on persistence of performance of desired behaviors. The survey suggested for this company workplace safety was communicated as important as well as education and training for workplace safety. Safety knowledge and employee involvement are key issues for improving attitude and behavior towards workplace safety.

Further, it seems models that offer flexibility would be superior in cases where diverse learner populations needed to be given training on general safety practices which required specific application on the job. This flexibility could provide an opportunity to address specific needs of targeted jobs for improving workplace safety. This targeting may improve workplace safety for any organization. Research on this targeting needs to be performed to determine if the supposition is correct.

Bibliography

- Adams, A. (2002). OSHA & ergonomics. *Professional Safety*, 47(9): 50-52.
- Adams, A., S. Bochner & L. Bilik. (1998). The effectiveness of warning signs in hazardous workplaces: cognitive and social determinants. *Applied Ergonomics*, 29(4): 247-254.
- Amparo, O., A. Cheyne, J.M. Tomas & S. Cox. (2002). The effects of organizational and individual factors on occupational accidents. *Journal of Occupational and Organizational Psychology*, 75(4): 473-488.
- Arthur, J. B. (1992). The link between business strategy and industrial relations systems in American steel minimills. *Industrial and Labor Relations Review*. 45.
- Barling, J., E.K. Kelloway & R.D. Iverson. (2003). High-quality work, job satisfaction, and occupational injuries. *Journal of Applied Psychology*, 88(2): 276-283.
- Barling, J., C. Loughlin & E.K. Kelloway. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology*, 87(3): 488-496.
- Bellus, D. (2002). Modern risk management. *CA Magazine*, 135(9): 35-37.
- Blair, E. (2003). Culture & leadership. *Professional Safety*, 48(6): 18.
- Crainer, S. (2003). One hundred years of management. *Business Strategy Review*, 14(2): 1-49.
- Cox, S., J. Tomas, A. Cheyne & A. Oliver. (1998). Safety culture: the prediction of commitment to safety in a manufacturing environment. *British Journal of Management*, 9(Special): S3-S11.

- Coyle, I.R., S.D. Sleeman & N. Adams. (1995). Safety climate. *Journal of Safety Research*, 26(4): 247-254.
- Dana, K. & R.W. Griffin. (1999). Health and well-being in the workplace: a review and synthesis of the literature. *Journal of Management*, 25(3): 357-372.
- Daugherty, D. (1996). OSHA update: preventative maintenance for people. *Supervisory Management*, 41(1): 5.
- DeJoy, D.M. (1994). Managing safety in the workplace: an attribution theory analysis and model. *Journal of Safety Research*, 25(1): 3-17.
- Eckhardt, R.F. (2001). The moral duty to provide workplace safety. *Professional Safety*, 46(8): 36-37.
- Engineer has duty to protect workers. (1995). *ENR: Engineering News-Record*, 234(25): 31.
- Fograsher, J. (1999). Want to sell safety to management? *Safety & Health*, 159(1): 82-84.
- Gaspers, C. (2002). Experience the best of both worlds. *Safety & Health*, 165(3): 54-55.
- Gaspers, C. (2002). Executive decision. *Safety & Health*, 165(5): 44-47.
- Garvin, David A. (July/August, 1993). "Building a learning organization." *Harvard Business Review*, 71(4): 78-91.
- Geller, E.S. (2003). How to use fear to motivate safety involvement. *Occupational Health & Safety*, 6(1): 6-11.
- Geronsin, R. (2001). Job hazard assessment: a comprehensive approach. *Professional Safety*, 46(12): 23-31.

- Hayes, B.E., J. Perender, T. Smecko & J. Trask. (1998). Measuring perceptions of workplace safety: development and validation of the work safety scale. *Journal of Safety Research*, 29(3): 145-161.
- Hoffmann, D.A., F. Morgeson & S.J. Gerras. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship. *Journal of Applied Psychology*, 88(1): 170-178.
- Hoffmann, D.A. & Stetzer. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology*, 49(2): 307-339.
- Kabanoff, B. (1998). The role of safety climate and communication in accident interpretation: implications for learning from negative events. *Academy of Management Journal*, 41(6): 643-658.
- Kabanoff, B. (1991). Equity, equality, power and conflict. *Academy of Management Review*, 16(2): 416-441.
- Kabanoff, B., R. Waldersee & M. Cohen. (1995). Espoused values and organizational change themes. *Academy of Management Journal*, 38(4): 1075-1104.
- Lissy, W. (1995). Safety rule violations. *Supervision*, 56(12): 20-21.
- Mack, G. (2001). Fifty years of hand protection. *Occupational Health & Safety*, 70(9): 96-99.
- McLain, D.L. (1995). Responses to health and safety risk in the workplace. *Academy of Management Journal*, 38(6): 1726-1743.
- McManus, K. (2000). Who decides what is a safe workplace? *IIE Solutions*, 32(10): 18.
- Mearns, K.J. & R. Flin. (1999). Assessing the state of organizational safety—culture or climate? *Current Psychology*, 18(1): 5-19.

- Mintz, B.W. (1984). *OSHA: History, Law And Policy*. Washington DC: Bureau of National Affairs.
- Morgan, C. (2001). Murder incorporated. *Risk Management*, 48(3): 80.
- National Safety Council (1991). *Supervisors' safety manual*. Chicago: Library of Congress Cataloging in Publication Data.
- Neal, A. & M.A. Griffin. (2002). Safety climate and safety behavior. *Australian Journal of Management*, 27(Special Issue): 67-75.
- Nelson, D. (2001). Who is responsible for safety? *Professional Safety*, 46(4): 21-24.
- Nonaka, I. (1998). "The knowledge creating company." In: *Harvard Business Review on Knowledge Management* (21-45), Boston, MA: Harvard Business School Press.
- Pun, K. & I. Hui. (2002). Integrating the safety dimension into quality management systems: a process model. *Total Quality Management*, 13(3): 373-391.
- Reynolds, L. (1997). OSHA reform or deform? *HR Focus*, 74(9): 11.
- Rundmo, T. (1995). Perceived risks, safety status and job stress among injured and uninjured workers on offshore petroleum installations. *Journal of Safety Research*, 26(2): 87-97.
- Schaechtel, D. (1997). How to build a safety management system. *Professional Safety*, 42(8): 22-24.
- Schuler, R. S., & Jackson, S. E. (10 May, 1988). "Linking remuneration practices to innovation as a competitive strategy." *Human Resource Management Australia*.
- Sheehan, D.B. (1999). Safety and the Heisenberg uncertainty principle. *Professional Safety*, 44(4): 41-42.

- Thatcher, J. J. (2003). Culture or behavior: Which comes first? *Occupational Hazards*, 65(4): 52-56.
- Vinokaur-Kaplan, D., S. Jayaratne & W.A. Chess. (1994). Job satisfaction and retention of social workers in public agencies, non-profit agencies and private practice. *Administration in Social Work*, 18(3): 93-121.
- Wortham, S. (1998). Let your workers lead the way: participatory ergonomics. *Safety & Health*, 158(1): 66-69.
- Yeakey, G. W. (2002). Situational leadership. *Military Review*, 72. Retrieved online September 19, 2003:
<http://www.au.af.mil/au/awc/awcgate/awc-ldrt.htm#situational>.
- Zohar, D. (2000). A group-level model of safety climate: testing the effect of group climate on microaccidents in a manufacturing environment. *Journal of Applied Psychology*, 85(4): 587-602.
- Zoller, H.M. (2003). Health on the line: identity and disciplinary control in employee occupational health and safety discourse. *Journal of Applied Communication Research*, 31(2): 118-239.

APPENDIX A

SURVEY

INTERVIEW AND QUESTION INFORMATION

SAFETY AND JOB SATISFACTION OPINION QUESTIONNAIRE SURVEY

We are all interested in maintaining sound safety policies, practices and job satisfaction. During this survey each participant will respond to safety issues as well as other aspects of your job. You can help by contributing your opinions through this questionnaire. We hope you will be sincere and honest with your responses. We would appreciate your frank, straight-from-the-shoulder answers. There are no right or wrong answers. Please read each question carefully. Then check the one answer that most nearly reflects your personal opinion.

This survey is important, and your opinions are valued. The survey is confidential as your name or company will not be identified and your participation is voluntary. All participants agree that a consent form is waived as a result of your voluntary participation. Questionnaires will be analyzed to determine proper needs. Please do not put your name anywhere on the questionnaire. When you have finished, please hand in the questionnaire. Thank you for taking the time to give us your most valued opinions.

JOB SATISFACTION

1. Considering everything, how satisfied are you with your job?
 - 1 - Very satisfied
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor

2. I enjoy the kind of work that I perform.
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

3. My job makes good use of my skills and abilities?
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

4. How good a job do you feel is being done by your immediate manager/supervisor?
 - 1 - Very good
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor

5. The people I work with cooperate to get the job done.
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

6. How do you rate the amount of pay you get on your job?
- 1 - Very good
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor
7. In comparison with people in similar jobs in other companies, I feel my pay is:
- 1 - Much higher
 - 2 - Slightly higher
 - 3 - About the same
 - 4 - Slightly lower
 - 5 - Much lower
8. How do you rate your total benefits program (insurance, medical, etc.)?
- 1 - Very good
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor
9. How do you rate this company in providing job security for people like yourself?
- 1 - Very good
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor
10. How satisfied are you with your opportunity to get a better job in this company?
- 1 - Very satisfied
 - 2 - Satisfied
 - 3 - Neither satisfied nor dissatisfied
 - 4 - Dissatisfied
 - 5 - Very dissatisfied

11. How satisfied are you with the information you receive from management on what's going on in the company?

- 1 - Very satisfied
- 2 - Satisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Dissatisfied
- 5 - Very dissatisfied

12. I have enough information to do my job well.

- 1 - Strongly agree
- 2 - Agree
- 3 - Neither agree nor disagree
- 4 - Disagree
- 5 - Strongly disagree

13. Sufficient effort is made to get the opinions and thinking of people who work here?

- 1 - Strongly agree
- 2 - Agree
- 3 - Neither agree nor disagree
- 4 - Disagree
- 5 - Strongly disagree

14. How satisfied are you with the training received for your present job?

- 1 - Very satisfied
- 2 - Satisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Dissatisfied
- 5 - Very dissatisfied

15. I am given a real opportunity to improve my skills in this company?

- 1 - Strongly agree
- 2 - Agree
- 3 - Neither agree nor disagree
- 4 - Disagree
- 5 - Strongly disagree

16. Considering everything, how would you rate your overall satisfaction in your company at the present time?
- 1 - Very satisfied
 - 2 - Satisfied
 - 3 - Neither satisfied nor dissatisfied
 - 4 - Dissatisfied
 - 5 - Very dissatisfied
17. My work gives me a feeling of personal accomplishment?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
18. How satisfied are you with the recognition you receive for doing a good job?
- 1 - Very satisfied
 - 2 - Satisfied
 - 3 - Neither satisfied nor dissatisfied
 - 4 - Dissatisfied
 - 5 - Very dissatisfied
19. How satisfied are you with your involvement in decisions that effect your work?
- 1 - Very satisfied
 - 2 - Satisfied
 - 3 - Neither satisfied nor dissatisfied
 - 4 - Dissatisfied
 - 5 - Very dissatisfied
20. My company is making the necessary changes to compete effectively?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

21. Conditions in my job allow me to be about as productive as I could be?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
22. How would you rate the overall quality of work done in your work group?
- 1 - Very good
 - 2 - Good
 - 3 - Fair
 - 4 - Poor
 - 5 - Very poor
23. The amount of work I am expected to do on my job is:
- 1 - Far too much
 - 2 - Too much
 - 3 - About right
 - 4 - Too little
 - 5 - Far too little
24. How satisfied are you with your physical working conditions?
- 1 - Very satisfied
 - 2 - Satisfied
 - 3 - Neither satisfied nor dissatisfied
 - 4 - Dissatisfied
 - 5 - Very dissatisfied
25. I feel encouraged to come up with new and better ways of doing things.
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

26. How much would you rate this company as a company to work for compared to other companies?

- 1 - One of the best
- 2 - Above average
- 3 - Average
- 4 - Below average
- 5 - One of the worst

SAFETY ATTITUDE EVALUATION SURVEY

1. In my department, management and workers support workplace safety?
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

2. The safety risks of my job, concern me quite a bit.
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

3. In my department, workers who do not follow good safety practices irritate their fellow workers even when no one gets hurt.
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

4. Supervisors in my department appreciate when I tell them about safety hazards, and they try to get them corrected quickly.
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

5. Our plant manager is well informed about safety issues in our plant?
 - 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
 - 6 - I do not have enough information to answer this question.

6. I have the authority and responsibility to lock-out a piece of equipment before working on it?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
7. Operations and equipment in my plant have been designed so that they can easily be locked out?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
8. If I choose not to lock out operations, machines, or equipment before I work on them, I will be held accountable for my decision?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
9. Working safely is the number one priority in my department.
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree
10. It is not a common practice in my plant to defeat safety interlocks?
- 1 - Strongly agree
 - 2 - Agree
 - 3 - Neither agree nor disagree
 - 4 - Disagree
 - 5 - Strongly disagree

11. Supervisors in my department may say I should lockout, but when push comes to shove and an operation is down, they really do not care and just want to get the operation up as soon as possible, no matter what it takes.

1 - Strongly agree
2 - Agree
3 - Neither agree nor disagree
4 - Disagree
5 - Strongly disagree

12. The union and the company really want workers to use lockout.

1 - Strongly agree
2 - Agree
3 - Neither agree nor disagree
4 - Disagree
5 - Strongly disagree

SAFETY KNOWLEDGE EVALUATION SURVEY I

1. The number of workers killed between 1977 and 1988 as a result of failure to lock-out was:
 - (a) 7
 - (b) 14
 - (c) 30
2. The number of workers seriously injured between 1980 and 1985 as a result of failure to lock-out was:
 - (a) 71
 - (b) 129
 - (c) 30
3. Poor housekeeping presents what type of problem?
 - (a) Personal
 - (b) Environmental
 - (c) Organization
4. If a facility does not enforce Energy Control and Power Lock-out procedures, it has a major:
 - (a) Personal problem
 - (b) Environmental problem
 - (c) Organization problem
5. Responsibility means:
 - (a) Actions you are supposed to take
 - (b) The power to decide
 - (c) What you have to answer for
6. Authority means:
 - (a) Actions you are supposed to take
 - (b) The power to decide
 - (c) What you have to answer for
7. Accountability means:
 - (a) Actions you are supposed to take
 - (b) The power to decide

- (c) What you have to answer for
8. When you know that you should control and lock-out energy. You must exercise your:
- (a) Responsibility
 - (b) Authority
 - (c) Accountability
9. Accidents happen because of:
- (a) Carelessness
 - (b) Poorly designed equipment
 - (c) A combination of things
10. Anger causes accidents:
- (a) True
 - (b) False
11. Each person should have their own approved safety lock:
- (a) True
 - (b) False
12. You never loan your lock to anyone else:
- (a) True
 - (b) False
13. Hazards usually increase when there is more than one person working on a job:
- (a) True
 - (b) False
14. When troubleshooting you must stop and think as soon as you have identified the problem:
- (a) True
 - (b) False

15. As soon as you have decided to lock-out, you should first:
- (a) Do it immediately
 - (b) Communicate with necessary personnel
 - (c) Prepare the area
16. A good system for communicating the need to lock-out is important:
- (a) True
 - (b) False
17. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lock-out as well:
- (a) True
 - (b) False
18. Once you know the principles of lock-out, you should be able to lock-out any machine:
- (a) True
 - (b) False
19. Effectively locking out a machine fed by multiple energies often requires that you use more than one lock:
- (a) True
 - (b) False
20. Which one of the following are acceptable electrical disconnects?
- (a) On-off button
 - (b) Selector switch
 - (c) Toggle switch
 - (d) Manually operated disconnect switch which can be locked in the off position.
21. Pulling fuses and circuit breakers in panels to shut-off electric power may be performed by:
- (a) Electricians only
 - (b) All skilled trades personnel
 - (c) Anyone needed to lock-out equipment

22. Stored energy cannot always be locked out:
- (a) True
 - (b) False
23. Stored electrical energy is present in batteries:
- (a) True
 - (b) False
24. Mechanical motion/energy must be:
- (a) Controlled
 - (b) Dissipated
25. The word verify means:
- (a) Make sure
 - (b) Double-check
 - (c) Both of the above
26. When working in a team, you should verify that each person has placed a safety lock on each appropriate disconnect:
- (a) True
 - (b) False

SAFETY KNOWLEDGE EVALUATION SURVEY II

1. How often do you lockout power and control energy before you work in a machine or on equipment?
 - 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever

2. How often are departmental locks used at your plant when, equipment, machines, or operations will be down into the next shift or longer?
 - 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever

3. When is it necessary for everyone working on operations or equipment to put their lock on the power or energy source?
 - 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever

4. Before starting a job, how often do you consciously evaluate the consequences of not doing the job safely?
 - 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever

5. How often, because of the pressure to get the job back in operation, do you not lockout or control power and energy?
- 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever
6. In the last month, before I worked on a machine, operation, or equipment, I locked out power and controlled energy?
- 1 - Always
 - 2 - More often than not
 - 3 - Sometimes
 - 4 - Occasionally
 - 5 - Hardly ever
7. When is it OK to loan your lock to a fellow worker?
- 1 - Never
 - 2 - Occasionally
 - 3 - Sometimes
 - 4 - More often than not
 - 5 - Always
8. How often does a worker in your plant not lockout all sources of power and energy because they do not have enough locks?
- 1 - Never
 - 2 - Occasionally
 - 3 - Sometimes
 - 4 - More often than not
 - 5 - Always
9. In your work assignments, how often is it impossible to lockout or control all sources of power and energy?
- 1 - Never
 - 2 - Occasionally
 - 3 - Sometimes
 - 4 - More often than not
 - 5 - Always

Circle the number next to the answer that best reflects your answer to the following questions.

10. As soon as you have decided to lockout, you should first:
- 1 - Do it immediately
 - 2 - Communicate with necessary personnel
 - 3 - Prepare the area
11. Preparing the area for lockout means:
- 1 - Checking the hazards
 - 2 - Doing something about the hazards
 - 3 - Both of the above
12. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lockout too.
- 1 - True
 - 2 - False
13. Once you have worked on a piece of machinery a few times and know it well, you can assume you can always lock it out safely?
- 1 - True
 - 2 - False
14. Once you know the principles of lockout, you should be able to lockout any machine?
- 1 - True
 - 2 - False
15. Effectively locking out a machine fed by multiple energies often requires that you use more than one lock.
- 1 - True
 - 2 - False
16. In locking out air, oil, water, steam, or gas under pressure:
- 1 - Must be dissipated
 - 2 - Must be released

17. Which of the following are proper disconnect points for a pneumatic system?
- 1 - Piston valve
 - 2 - Handle/lever valve
 - 3 - Gate valve
 - 4 - All of the above
18. Which of the following are acceptable electrical disconnects?
- 1 - On-off button
 - 2 - Selector switch
 - 3 - Toggle switch
 - 4 - Manually operated disconnect switch which can be locked in the off position
19. Stored energy can always be locked out?
- 1 - True
 - 2 - False
20. Mechanical motion must be:
- 1 - Controlled
 - 2 - Dissipated
21. Gravity must be:
- 1 - Controlled
 - 2 - Dissipated
22. Stored mechanical energy in springs may be controlled or dissipated?
- 1 - True
 - 2 - False
23. Safety blocks are built to withstand the force of the cycling?
- 1 - True
 - 2 - False
24. When releasing hydraulic pressure, it is sometimes necessary to check, that the pressure has been released by breaking the line at a fitting connection?
- 1 - True
 - 2 - False

25. When making sure that pneumatic energy is absent, pressure gauges alone are enough to tell you that the pneumatic energy is absent?
- 1 - True
 - 2 - False
26. When working in a team you should make sure that each person has placed a safety lock on each appropriate disconnect?
- 1 - True
 - 2 - False
27. If you have to leave a job site after controlling and locking out power and energy and making sure that power and energy are absent, then as soon as you return to the job you should:
- 1 - Continue work
 - 2 - Again make sure power and energy are controlled and locked out
28. When pulling electrical disconnect switches you should:
- 1 - Face away from the cabinet box or panel
 - 2 - Face the panel box or cabinet
29. If you intend to work in a confined space that has a carbon dioxide fire extinguishing system, you should lock the system out before entering the confined space?
- 1 - True
 - 2 - False
30. Whenever you need to lockout, all you should concern yourself with is locking out the machine on which you are working?
- 1 - True
 - 2 - False
31. It is your responsibility to make sure that any safety guards you removed during your work are put back properly after your work is done?
- 1 - True
 - 2 - False

DEMOGRAPHICS EVALUATION SURVEY

1. Your age is:

- 1 - Less than 25
- 2 - 25-35
- 3 - 36-45
- 4 - 46-55
- 5 - 56 or older

2. Race:

- 1 - White
- 2 - Hispanic
- 3 - Native American Indian
- 4 - Asian or Pacific Islander
- 5 - Black
- 6 - Other

3. Sex:

- 1 - Male
- 2 - Female

4. Job Title Information:

Job Title	Department			%Participants
	Production	Maintenance	Shipping	
Supervisors				
Control man				
Reactor Operator				
Wet Process				
Technician				
Electrician				
Welder				
Repairman				
Painter/Carpenter				
Forklift Operator				
Warehouse				
Crewman				
Building				
Printer				
Loader				
Valve Packer				
Total				

PERSONAL OPINION SUPERVISION EMPHASIS SURVEY

Please circle the correct response. What attention or emphasis is given to the following by your supervisor?

The quality of your work	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Costs involved in your work	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Meeting schedules	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Getting your reactions and suggestions	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Giving you information	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Getting full use of your abilities	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Safety and housekeeping	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Development of subordinates	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Innovations & new ideas	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Effective teamwork among subordinates	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Employee's commitment to workplace safety	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Company's commitment to workplace safety	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>
Safety practices & procedures are followed	<u>Too Much</u>	<u>OK</u>	<u>Too Little</u>	<u>NA</u>

* NA = NEEDS ATTENTION

APPENDIX B

JOB SATISFACTION RESULTS

1. Considering everything, how satisfied are you with your job?

1	Very satisfied	18=21%
2	Good	25=31%
3	Fair	31=38%
4	Poor	6=8%
5	Very poor	2=2%

2. I enjoy the kind of work that I perform.

1	Strongly agree	16=20%
2	Agree	39=48%
3	Neither agree nor disagree	22=27%
4	Disagree	4=4%
5	Strongly disagree	2=2%

3. My job makes good use of my skills and abilities?

1	Strongly agree	8=10%
2	Agree	42=52%
3	Neither agree nor disagree	24=29%
4	Disagree	6=8%
5	Strongly disagree	2=2%

4. How good a job do you feel is being done by your immediate manager/supervisor?

1	Very good	16=19%
2	Good	26=31%
3	Fair	30=37%
4	Poor	10=13%
5	Very poor	

5. The people I work with cooperate to get the job done.

1	Strongly agree	10=12%
2	Agree	22=27%
3	Neither agree nor disagree	30=37%
4	Disagree	20=24%
5	Strongly disagree	

6. How do you rate the amount of pay you get on your job?

1 - Very good	6=8%
2 - Good	34=41%
3 - Fair	24=29%
4 - Poor	16=20%
5 - Very poor	2=2%

7. In comparison with people in similar jobs in other companies, I feel my pay is:

1 - Much higher	2=2%
2 - Slightly higher	22=27%
3 - About the same	26=32%
4 - Slightly lower	26=31%
5 - Much lower	6=8%

8. How do you rate your total benefits program (insurance, medical, etc.)?

1 - Very good	6=6%
2 - Good	23=28%
3 - Fair	25=31%
4 - Poor	22=27%
5 - Very poor	6=8%

9. How do you rate this company in providing job security for people like yourself?

1 - Very good	4=4%
2 - Good	26=31%
3 - Fair	22=27%
4 - Poor	26=34%
5 - Very poor	4=4%

10. How satisfied are you with your opportunity to get a better job in this company?

1	Very satisfied	6=8%
2	Satisfied	12=15%
3	Neither satisfied nor dissatisfied	16=20%
4	Dissatisfied	48=57%
5	Very dissatisfied	

11. How satisfied are you with the information you receive from management on what's going on in the company?

1 - Very satisfied	8=9%
2 - Satisfied	12=15%
3 - Neither satisfied nor dissatisfied	28=35%
4 - Dissatisfied	26=31%
5 - Very dissatisfied	84=10%

12. I have enough information to do my job well.

1	Strongly agree	10=12%
2	Agree	23=28%
3	Neither agree nor disagree	23=28%
4	Disagree	22=27%
5	Strongly disagree	4=5%

13. Sufficient effort is made to get the opinions and thinking of people who work here?

1 - Strongly agree	6=7%
2 - Agree	32=39%
3 - Neither agree nor disagree	6=7%
4 - Disagree	31=38%
5 - Strongly disagree	6=7%

14. How satisfied are you with the training received for your present job?

1 - Very satisfied	10=12%
2 - Satisfied	21=25%
3 - Neither satisfied nor dissatisfied	17=22%
4 - Dissatisfied	28=34%
5 - Very dissatisfied	6=7%

15. I am given a real opportunity to improve my skills in this company?

1 - Strongly agree	8=9%
2 - Agree	17=22%
3 - Neither agree nor disagree	17=22%
4 - Disagree	36=42%
5 - Strongly disagree	4=5%

16. Considering everything, how would you rate your overall satisfaction in your company at the present time?

1 - Very satisfied	8=9%
2 - Satisfied	23=29%
3 - Neither satisfied nor dissatisfied	23=29%
4 - Dissatisfied	26=31%
5 - Very dissatisfied	2=2%

17. My work gives me a feeling of personal accomplishment?

1	Strongly agree	10=12%
2	Agree	30=37%
3	Neither agree nor disagree	26=32%
4	Disagree	14=17%
5	Strongly disagree	2=2%

18. How satisfied are you with the recognition you receive for doing a good job?

1	Very satisfied	10=12%
2	Satisfied	14=17%
3	Neither satisfied nor dissatisfied	20=23%
4	Dissatisfied	36=42%
5	Very dissatisfied	2=6%

19. How satisfied are you with your involvement in decisions that effect your work?

1	Very satisfied	6=7%
2	Satisfied	19=24%
3	Neither satisfied nor dissatisfied	21=25%
4	Dissatisfied	34=41%
5	Very dissatisfied	2=2%

20. My company is making the necessary changes to compete effectively?

1	Strongly agree	4=5%
2	Agree	18=21%
3	Neither agree nor disagree	29=36%
4	Disagree	31=38%
5	Strongly disagree	

21. Conditions in my job allow me to be about as productive as I could be?

1	Strongly agree	4=5%
2	Agree	24=29%
3	Neither agree nor disagree	27=33%
4	Disagree	27=33%
5	Strongly disagree	

22. How would you rate the overall quality of work done in your work group?

1	Very good	8=10%
2	Good	31=38%
3	Fair	
4	Poor	
5	Very poor	

23. The amount of work I am expected to do on my job is:

1	Far too much	14=17%
2	Too much	66=81%
3	About right	2= 2%
4	Too little	
5	Far too little	

24. How satisfied are you with your physical working conditions?

1	Very satisfied	2= 2%
2	Satisfied	16=19%
3	Neither satisfied nor dissatisfied	36=45%
4	Dissatisfied	24=29%
5	Very dissatisfied	4= 5%

25. I feel encouraged to come up with new and better ways of doing things.

1	Strongly agree	4= 5%
2	Agree	14=17%
3	Neither agree nor disagree	21=26%
4	Disagree	43=52%
5	Strongly disagree	

26. How much would you rate this company as a company to work for compared to other companies?

1	One of the best	6= 8%
2	Above average	4= 5%
3	Average	43=52%
4	Below average	27=33%
5	One of the worst	2= 2%

SAFETY ATTITUDE EVALUATION SURVEY

1. In my department, management and workers support workplace safety?

1	Strongly agree	6= 7%
2	Agree	32=39%
3	Neither agree nor disagree	42= 51%
4	Disagree	2= 3%
5	Strongly disagree	

2. The safety risks of my job, concern me quite a bit.

1	Strongly agree	10=12%
2	Agree	32=38%
3	Neither agree nor disagree	28=35%
4	Disagree	12=15%
5	Strongly disagree	

3. In my department, workers who do not follow good safety practices irritate their fellow workers even when no one gets hurt.

1	Strongly agree	10=12%
2	Agree	16=19%
3	Neither agree nor disagree	38=48%
4	Disagree	18=21%
5	Strongly disagree	

4. Supervisors in my department appreciate when I tell them about safety hazards, and they try to get them corrected quickly.

1	Strongly agree	10=13%
2	Agree	25=31%
3	Neither agree nor disagree	16=19%
4	Disagree	25=31%
5	Strongly disagree	6=6%

5. Our plant manager is well informed about safety issues in our plant?

1	Strongly agree	12=15%
2	Agree	21=25%
3	Neither agree nor disagree	21=27%
4	Disagree	10=12%
5	Strongly disagree	18=21%
6	I do not have enough information to answer this question.	

6. I have the authority and responsibility to lock-out a piece of equipment before working on it?

1	Strongly agree	8=10%
2	Agree	56=68%
3	Neither agree nor disagree	8=10%
4	Disagree	4=5%
5	Strongly disagree	6=7%

7. Operations and equipment in my plant have been designed so that they can easily be locked out?

1	Strongly agree	6=7%
2	Agree	60=73%
3	Neither agree nor disagree	10=12%
4	Disagree	4=5%
5	Strongly disagree	2=3%

8. If I choose not to lock out operations, machines, or equipment before I work on them, I will be held accountable for my decision?

1	Strongly agree	12=15%
2	Agree	64=78%
3	Neither agree nor disagree	6=7%
4	Disagree	
5	Strongly disagree	

9. Working safely is the number one priority in my department.

1	Strongly agree	14=17%
2	Agree	30=37%
3	Neither agree nor disagree	26=31%
4	Disagree	12=15%
5	Strongly disagree	

10. It is not a common practice in my plant to defeat safety interlocks?

1	Strongly agree	12=15%
2	Agree	52=63%
3	Neither agree nor disagree	8=10%
4	Disagree	10=12%
5	Strongly disagree	

11. Supervisors in my department may say I should lockout, but when push comes to shove and an operation is down, they really do not care and just want to get the operation up as soon as possible, no matter what it takes.

1	Strongly agree	
2	Agree	14=17%
3	Neither agree nor disagree	21=24%
4	Disagree	43=54%
5	Strongly disagree	4=5%

12. The union and the company really want workers to use lockout.

1	Strongly agree	10=12%
2	Agree	67=80%
3	Neither agree nor disagree	5=5%
4	Disagree	2=3%
5	Strongly disagree	

SAFETY KNOWLEDGE EVALUATION SURVEY I

1. The number of workers killed between 1977 and 1988 as a result of failure to lock-out was:

(a)	7	34=42%
(b)	14	20=25%
(c)	30	28=33%

2. The number of workers seriously injured between 1980 and 1985 as a result of failure to lock-out was:

(a)	71	18=21%
(b)	129	22=27%
(c)	30	42=52%

3. Poor housekeeping presents what type of problem?

(a)	Personal	46=56%
(b)	Environmental	8=10%
(c)	Organization	28=34%

4. If a facility does not enforce Energy Control and Power Lock-out procedures, it has a major:

(a)	Personal problem	17=21%
(b)	Environmental problem	6=7%
(c)	Organization problem	59=72%

5. Responsibility means:

(a)	Actions you are supposed to take	58=71%
(b)	The power to decide	6=7%
(c)	What you have to answer for	18=22%

6. Authority means:

(a)	Actions you are supposed to take	6=7%
(b)	The power to decide	20=86%
(c)	What you have to answer for	6=7%

7. Accountability means:

(a)	Actions you are supposed to take	10=12%
(b)	The power to decide	0=0%
(c)	What you have to answer for	72=88%

8. When you know that you should control and lock-out energy. You must exercise your:

(a)	Responsibility	64=78%
(b)	Authority	10=12%
(c)	Accountability	8=10%

9. Accidents happen because of:

(a)	Carelessness	42=52%
(b)	Poorly designed equipment	2=2%
(c)	A combination of things	38=46%

10. Anger causes accidents:

(a)	True	74=90%
(b)	False	8=10%

11. Each person should have his own approved safety lock:

(a)	True	74=90%
(b)	False	8=10%

12. You never loan your lock to anyone else:

(a)	True	80=98%
(b)	False	2=2%

13. Hazards usually increase when there is more than one person working on a job:

(a)	True	72=87%
(b)	False	10=13%

14. When troubleshooting you must stop and think as soon as you have identified the problem:

(a)	True	78=95%
(b)	False	4=5%

15. As soon as you have decided to lock-out, you should first:

(a)	Do it immediately	
(b)	Communicate with necessary personnel	6=68%
(c)	Prepare the area	26=32%

16. A good system for communicating the need to lock-out is important:

(a)	True	82=100%
(b)	False	

17. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lock-out as well:

(a)	True	82=100%
(b)	False	

18. Once you know the principles of lock-out, you should be able to lock-out any machine:

(a)	True	66=80%
(b)	False	16=20%

19. Effectively locking out a machine fed by multiple energies often requires that you use

more than one lock:

(a)	True	76=93%
(b)	False	6=7%

20. Which one of the following are acceptable electrical disconnects?

(a)	On-off button	2=2%
(b)	Selector switch	2=2%
(c)	Toggle switch	
(d)	Manually operated disconnect switch which can be locked in the off position.	78=96%

21. Pulling fuses and circuit breakers in panels to shut-off electric power may be performed by:

(a)	Electricians only	78=96%
(b)	All skilled trades personnel	2=2%
(c)	Anyone needed to lock-out equipment	2=2%

22. Stored energy cannot always be locked out:

(a)	True	72=87%
(b)	False	10=13%

23. Stored electrical energy is present in batteries:

(a)	True	78=95%
(b)	False	4=5%

24. Mechanical motion/energy must be:

(a)	Controlled	68=83%
(b)	Dissipated	14=17%

25. The word verify means:

(a)	Make sure	6=7%
(b)	Double-check	6=7%
(c)	Both of the above	70=86%

26. When working in a team, you should verify that each person has placed a safety lock on each appropriate disconnect:

(a)	True	78=95%
(b)	False	4=5%

SAFETY KNOWLEDGE EVALUATION SURVEY II

1. How often do you lockout power and control energy before you work in a machine or on equipment?

1	Always	38=47%
2	More often than not	28=34%
3	Sometimes	8=10%
4	Occasionally	2=2%
5	Hardly ever	6=7%

2. How often are departmental locks used at your plant when, equipment, machines, or operations will be down into the next shift or longer?

1	Always	48=59%
2	More often than not	14=17%
3	Sometimes	14=17%
4	Occasionally	
5	Hardly ever	6=7%

3. When is it necessary for everyone working on operations or equipment to put their lock on the power or energy source?

1	Always	52=64%
2	More often than not	10=12%
3	Sometimes	8=10%
4	Occasionally	6=7%
5	Hardly ever	6=7%

4. Before starting a job, how often do you consciously evaluate the consequences of not doing the job safely?

1	Always	27=33%
2	More often than not	33=40%
3	Sometimes	16=20%
4	Occasionally	2=2%
5	Hardly ever	4=5%

5. How often, because of the pressure to get the job back in operation, do you not lockout or control power and energy?

1	Always	14=18%
2	More often than not	8=10%
3	Sometimes	10=12%
4	Occasionally	10=12%
5	Hardly ever	40=48%

6. In the last month, before I worked on a machine, operation, or equipment, I locked out power and controlled energy?

1	Always	44=54%
2	More often than not	22=27%
3	Sometimes	4=5%
4	Occasionally	2=2%
5	Hardly ever	10=12%

7. When is it OK to loan your lock to a fellow worker?

1	Never	80=98%
2	Occasionally	
3	Sometimes	2=2%
4	More often than not	
5	Always	

8. How often does a worker in your plant not lockout all sources of power and energy because they do not have enough locks?

1	Never	42=52%
2	Occasionally	28=34%
3	Sometimes	10=12%
4	More often than not	2=2%
5	Always	

9. In your work assignments, how often is it impossible to lockout or control all sources of power and energy?

1	Never	46=56%
2	Occasionally	18=22%
3	Sometimes	14=17%
4	More often than not	
5	Always	4=5%

Circle the number next to the answer that best reflects your answer to the following questions. %

10. As soon as you have decided to lockout, you should first:

1	Do it immediately	4=5%
2	Communicate with necessary personnel	52=64%
3	Prepare the area	26=31%

11. Preparing the area for lockout means:

1	Checking the hazards	6=7%
2	Doing something about the hazards	6=7%
3	Both of the above	70=86%

12. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lockout too.

1	True	76=93%
2	False	3=7%

13. Once you have worked on a piece of machinery a few times and know it well, you can assume you can always lock it out safely?

1	True	49=60%
2	False	33=40%

14. Once you know the principles of lockout, you should be able to lockout any machine?

1	True	72=88%
2	False	10=12%

15. Effectively locking out a machine fed by multiple energies often requires that you use more than one lock.

1	True	80=98%
2	False	2=2%

16. In locking out air, oil, water, steam, or gas under pressure:

1	Must be dissipated	60=73%
2	Must be released	22=27%

17. Which of the following are proper disconnect points for a pneumatic system?

1	Piston valve	
2	Handle/lever valve	6=7%
3	Gate valve	6=7%
4	All of the above	70=86%

18. Which of the following are acceptable electrical disconnects?

1	On-off button	
2	Selector switch	2=2%
3	Toggle switch	
4	Manually operated disconnect switch which can be Locked in the off position	80=98%

19. Stored energy can always be locked out?

1	True	35=43%
2	False	47=57%

20. Mechanical motion must be:

1	Controlled	71=87%
2	Dissipated	11=13%

21. Gravity must be:

1	Controlled	74=90%
2	Dissipated	8=10%

22. Stored mechanical energy in springs may be controlled or dissipated?

1	True	70=85%
2	False	12=15%

23. Safety blocks are built to withstand the force of the cycling?

1	True	72=88%
2	False	10=12%

24. When releasing hydraulic pressure, it is sometimes necessary to check, that the pressure has been released by breaking the line at a fitting connection?

1	True	72=88%
2	False	10=12%

25. When making sure that pneumatic energy is absent, pressure gauges alone are enough to tell you that the pneumatic energy is absent?

1	True	34=44%
2	False	44=54%

26. When working in a team you should make sure that each person has placed a safety lock on each appropriate disconnect?

1	True	72=88%
2	False	10=12%

27. If you have to leave a job site after controlling and locking out power and energy and making sure that power and energy are absent, then as soon as you return to the job you should:

1	Continue work	6=7%
2	Again make sure power and energy are controlled and locked out	76=93%

28. When pulling electrical disconnect switches you should:

1	Face away from the cabinet box or panel	76=93%
2	Face the panel box or cabinet	6=7%

29. If you intend to work in a confined space that has a carbon dioxide fire extinguishing system, you should lock the system out before entering the confined space?

1	True	76=93%
2	False	6=7%

30. Whenever you need to lockout, all you should concern yourself with is locking out the machine on which you are working?

1	True	53=65%
2	False	29=35%

31. It is your responsibility to make sure that any safety guards you removed during your work are put back properly after your work is done?

1	True	80=98%
2	False	2=2%

DEMOGRAPHICS EVALUATION SURVEY	
1. Your age is:	
1 - Less than 25	2=3%
2 - 25-35	18=21%
3 - 36-45	27=34%
4 - 46-55	33=39%
5 - 56 or older	2=3%
2. Race:	
1 - White	66=80%
2 - Hispanic	4=5%
3 - Native American Indian	8=10%
4 - Asian or Pacific Islander	0=0%
5 - Black	4=5%
6 - Other	0=0%
3. Sex:	
1 - Male	82=100%
2 - Female	0=0%

4. Job Title Information:

Job Title	Department			%Participants
	Production	Maintenance	Shipping	
Supervisors	2	2	0	5
Control man	4			5
Reactor Operator	8			10
Wet Process	8			10
Technician		4		5
Electrician		2		3
Welder		4		5
Repairman		6		7
Painter/Carpenter		2		3
Forklift Operator		1	3	5
Warehouse		1	1	3
Crewman		6	21	32
Building		1	2	3
Printer			1	1
Loader			1	1
Valve Packer			2	2
Total	22	29	31	100%

PERSONAL OPINION SUPERVISION EMPHASIS SURVEY

Please circle the correct response. What attention or emphasis is given to the following by your supervisor?

(Needs Attention)

The quality of your work	<u>Too Much</u>	OK	Too Little	NA
	2=2%	74=91%	2= 2%	4= 5%
Costs involved in your work	<u>Too Much</u>	OK	Too Little	NA
	2= 2%	72=88%	8=10%	
Meeting schedules	<u>Too Much</u>	OK	Too Little	NA
	4= 5%	68=83%	4= 5%	6= 7%
Getting your reactions and suggestions	<u>Too Much</u>	OK	Too Little	NA
		36=44%	40=49%	6= 7%
Giving you information	<u>Too Much</u>	OK	Too Little	NA
		36=44%	36=44%	10=12%
Getting full use of your abilities	<u>Too Much</u>	OK	Too Little	NA
		50=61%	22=27	10=12%
Safety and housekeeping	<u>Too Much</u>	OK	Too Little	NA
	56=68%	20=25%	6= 7%	
Development of subordinates	<u>Too Much</u>	OK	Too Little	NA
	2= 2%	34=42%	34=42%	12=14%
Innovations & new ideas	<u>Too Much</u>	OK	Too Little	NA
		33=40%	39=48%	10=12%
Effective teamwork among subordinates	<u>Too Much</u>	OK	Too Little	NA
		38=48%	37=45%	6= 7%
Employee's commitment to workplace safety	<u>Too Much</u>	OK	Too Little	NA
		70=88%	10=12%	
Company's commitment to workplace safety	<u>Too Much</u>	OK	Too Little	NA
		54=66%	28=34%	
Safety practices & procedures are followed	<u>Too Much</u>	OK	Too Little	NA
		72=88%	8=10%	2= 2%

APPENDIX B

JOB SATISFACTION RESULTS

1. Considering everything, how satisfied are you with your job?

1	Very satisfied	18=21%
2	Good	25=31%
3	Fair	31=38%
4	Poor	6=8%
5	Very poor	2=2%

2. I enjoy the kind of work that I perform.

1	Strongly agree	16=20%
2	Agree	39=48%
3	Neither agree nor disagree	22=27%
4	Disagree	4=4%
5	Strongly disagree	2=2%

3. My job makes good use of my skills and abilities?

1	Strongly agree	8=10%
2	Agree	42=52%
3	Neither agree nor disagree	24=29%
4	Disagree	6=8%
5	Strongly disagree	2=2%

4. How good a job do you feel is being done by your immediate manager/supervisor?

1	Very good	16=19%
2	Good	26=31%
3	Fair	30=37%
4	Poor	10=13%
5	Very poor	

5. The people I work with cooperate to get the job done.

1	Strongly agree	10=12%
2	Agree	22=27%
3	Neither agree nor disagree	30=37%
4	Disagree	20=24%

6. How do you rate the amount of pay you get on your job?

1 - Very good	6=8%
2 - Good	34=41%
3 - Fair	24=29%
4 - Poor	16=20%
5 - Very poor	2=2%

7. In comparison with people in similar jobs in other companies, I feel my pay is:

1 - Much higher	2=2%
2 - Slightly higher	22=27%
3 - About the same	26=32%
4 - Slightly lower	26=31%
5 - Much lower	6=8%

8. How do you rate your total benefits program (insurance, medical, etc.)?

1 - Very good	6=6%
2 - Good	23=28%
3 - Fair	25=31%
4 - Poor	22=27%
5 - Very poor	6=8%

9. How do you rate this company in providing job security for people like yourself?

1 - Very good	4=4%
2 - Good	26=31%
3 - Fair	22=27%
4 - Poor	26=34%
5 - Very poor	4=4%

10. How satisfied are you with your opportunity to get a better job in this company?

1	Very satisfied	6=8%
2	Satisfied	12=15%
3	Neither satisfied nor dissatisfied	16=20%
4	Dissatisfied	48=57%
5	Very dissatisfied	

11. How satisfied are you with the information you receive from management on what's going on in the company?

1 - Very satisfied	8=9%
2 - Satisfied	12=15%
3 - Neither satisfied nor dissatisfied	28=35%
4 - Dissatisfied	26=31%
5 - Very dissatisfied	84=10%

12. I have enough information to do my job well.

1	Strongly agree	10=12%
2	Agree	23=28%
3	Neither agree nor disagree	23=28%
4	Disagree	22=27%
5	Strongly disagree	4=5%

13. Sufficient effort is made to get the opinions and thinking of people who work here?

1 - Strongly agree	6=7%
2 - Agree	32=39%
3 - Neither agree nor disagree	6=7%
4 - Disagree	31=38%
5 - Strongly disagree	6=7%

14. How satisfied are you with the training received for your present job?

1 - Very satisfied	10=12%
2 - Satisfied	21=25%
3 - Neither satisfied nor dissatisfied	17=22%
4 - Dissatisfied	28=34%
5 - Very dissatisfied	6=7%

15. I am given a real opportunity to improve my skills in this company?

1 - Strongly agree	8=9%
2 - Agree	17=22%
3 - Neither agree nor disagree	17=22%
4 - Disagree	36=42%
5 - Strongly disagree	4=5%

16. Considering everything, how would you rate your overall satisfaction in your company at the present time?

1 - Very satisfied	8=9%
2 - Satisfied	23=29%
3 - Neither satisfied nor dissatisfied	23=29%
4 - Dissatisfied	26=31%
5 - Very dissatisfied	2=2%

17. My work gives me a feeling of personal accomplishment?

1	Strongly agree	10=12%
2	Agree	30=37%
3	Neither agree nor disagree	26=32%
4	Disagree	14=17%
5	Strongly disagree	2=2%

18. How satisfied are you with the recognition you receive for doing a good job?

1	Very satisfied	10=12%
2	Satisfied	14=17%
3	Neither satisfied nor dissatisfied	20=23%
4	Dissatisfied	36=42%
5	Very dissatisfied	2=6%

19. How satisfied are you with your involvement in decisions that effect your work?

1	Very satisfied	6=7%
2	Satisfied	19=24%
3	Neither satisfied nor dissatisfied	21=25%
4	Dissatisfied	34=41%
5	Very dissatisfied	2=2%

20. My company is making the necessary changes to compete effectively?

1	Strongly agree	4=5%
2	Agree	18=21%
3	Neither agree nor disagree	29=36%
4	Disagree	31=38%
5	Strongly disagree	

21. Conditions in my job allow me to be about as productive as I could be?

1	Strongly agree	4=5%
2	Agree	24=29%
3	Neither agree nor disagree	27=33%
4	Disagree	27=33%
5	Strongly disagree	

22. How would you rate the overall quality of work done in your work group?

1	Very good	8=10%
2	Good	31=38%
3	Fair	
4	Poor	
5	Very poor	

23. The amount of work I am expected to do on my job is:

1	Far too much	14=17%
2	Too much	66=81%
3	About right	2= 2%
4	Too little	
5	Far too little	

24. How satisfied are you with your physical working conditions?

1	Very satisfied	2= 2%
2	Satisfied	16=19%
3	Neither satisfied nor dissatisfied	36=45%
4	Dissatisfied	24=29%
5	Very dissatisfied	4= 5%

25. I feel encouraged to come up with new and better ways of doing things.

1	Strongly agree	4= 5%
2	Agree	14=17%
3	Neither agree nor disagree	21=26%
4	Disagree	43=52%
5	Strongly disagree	

26. How much would you rate this company as a company to work for compared to other companies?

1	One of the best	6= 8%
2	Above average	4= 5%
3	Average	43=52%
4	Below average	27=33%
5	One of the worst	2= 2%

SAFETY ATTITUDE EVALUATION SURVEY

1. In my department, management and workers support workplace safety?

1	Strongly agree	6= 7%
2	Agree	32=39%
3	Neither agree nor disagree	42= 51%
4	Disagree	2= 3%
5	Strongly disagree	

2. The safety risks of my job, concern me quite a bit.

1	Strongly agree	10=12%
2	Agree	32=38%
3	Neither agree nor disagree	28=35%
4	Disagree	12=15%
5	Strongly disagree	

3. In my department, workers who do not follow good safety practices irritate their fellow workers even when no one gets hurt.

1	Strongly agree	10=12%
2	Agree	16=19%
3	Neither agree nor disagree	38=48%
4	Disagree	18=21%
5	Strongly disagree	

4. Supervisors in my department appreciate when I tell them about safety hazards, and they try to get them corrected quickly.

1	Strongly agree	10=13%
2	Agree	25=31%
3	Neither agree nor disagree	16=19%
4	Disagree	25=31%
5	Strongly disagree	6=6%

5. Our plant manager is well informed about safety issues in our plant?

1	Strongly agree	12=15%
2	Agree	21=25%
3	Neither agree nor disagree	21=27%
4	Disagree	10=12%
5	Strongly disagree	18=21%
6	I do not have enough information to answer this question.	

6. I have the authority and responsibility to lock-out a piece of equipment before working on it?

1	Strongly agree	8=10%
2	Agree	56=68%
3	Neither agree nor disagree	8=10%
4	Disagree	4=5%
5	Strongly disagree	6=7%

7. Operations and equipment in my plant have been designed so that they can easily be locked out?

1	Strongly agree	6=7%
2	Agree	60=73%
3	Neither agree nor disagree	10=12%
4	Disagree	4=5%
5	Strongly disagree	2=3%

8. If I choose not to lock out operations, machines, or equipment before I work on them, I will be held accountable for my decision?

1	Strongly agree	12=15%
2	Agree	64=78%
3	Neither agree nor disagree	6=7%
4	Disagree	
5	Strongly disagree	

9. Working safely is the number one priority in my department.

1	Strongly agree	14=17%
2	Agree	30=37%
3	Neither agree nor disagree	26=31%
4	Disagree	12=15%
5	Strongly disagree	

10. It is not a common practice in my plant to defeat safety interlocks?

1	Strongly agree	12=15%
2	Agree	52=63%
3	Neither agree nor disagree	8=10%
4	Disagree	10=12%
5	Strongly disagree	

11. Supervisors in my department may say I should lockout, but when push comes to shove and an operation is down, they really do not care and just want to get the operation up as soon as possible, no matter what it takes.

1	Strongly agree	
2	Agree	14=17%
3	Neither agree nor disagree	21=24%
4	Disagree	43=54%
5	Strongly disagree	4=5%

12. The union and the company really want workers to use lockout.

1	Strongly agree	10=12%
2	Agree	67=80%
3	Neither agree nor disagree	5=5%
4	Disagree	2=3%
5	Strongly disagree	

SAFETY KNOWLEDGE EVALUATION SURVEY I

1. The number of workers killed between 1977 and 1988 as a result of failure to lock-out was:

(a)	7	34=42%
(b)	14	20=25%
(c)	30	28=33%

2. The number of workers seriously injured between 1980 and 1985 as a result of failure to lock-out was:

(a)	71	18=21%
(b)	129	22=27%
(c)	30	42=52%

3. Poor housekeeping presents what type of problem?

(a)	Personal	46=56%
(b)	Environmental	8=10%
(c)	Organization	28=34%

4. If a facility does not enforce Energy Control and Power Lock-out procedures, it has a major:

(a)	Personal problem	17=21%
(b)	Environmental problem	6=7%
(c)	Organization problem	59=72%

5. Responsibility means:

(a)	Actions you are supposed to take	58=71%
(b)	The power to decide	6=7%
(c)	What you have to answer for	18=22%

6. Authority means:

(a)	Actions you are supposed to take	6=7%
(b)	The power to decide	20=86%
(c)	What you have to answer for	6=7%

7. Accountability means:

(a)	Actions you are supposed to take	10=12%
(b)	The power to decide	0=0%
(c)	What you have to answer for	72=88%

8. When you know that you should control and lock-out energy. You must exercise your:

(a)	Responsibility	64=78%
(b)	Authority	10=12%
(c)	Accountability	8=10%

9. Accidents happen because of:

(a)	Carelessness	42=52%
(b)	Poorly designed equipment	2=2%
(c)	A combination of things	38=46%

10. Anger causes accidents:

(a)	True	74=90%
(b)	False	8=10%

11. Each person should have his own approved safety lock:

(a)	True	74=90%
(b)	False	8=10%

12. You never loan your lock to anyone else:

(a)	True	80=98%
(b)	False	2=2%

13. Hazards usually increase when there is more than one person working on a job:

(a)	True	72=87%
(b)	False	10=13%

14. When troubleshooting you must stop and think as soon as you have identified the problem:

(a)	True	78=95%
(b)	False	4=5%

15. As soon as you have decided to lock-out, you should first:

(a)	Do it immediately	
(b)	Communicate with necessary personnel	6=68%
(c)	Prepare the area	26=32%

16. A good system for communicating the need to lock-out is important:

(a)	True	82=100%
(b)	False	

17. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lock-out as well:

(a)	True	82=100%
(b)	False	

18. Once you know the principles of lock-out, you should be able to lock-out any machine:

(a)	True	66=80%
(b)	False	16=20%

19. Effectively locking out a machine fed by multiple energies often requires that you use more than one lock:

(a)	True	76=93%
(b)	False	6=7%

20. Which one of the following are acceptable electrical disconnects?

(a)	On-off button	2=2%
(b)	Selector switch	2=2%
(c)	Toggle switch	
(d)	Manually operated disconnect switch which can be locked in the off position.	78=96%

21. Pulling fuses and circuit breakers in panels to shut-off electric power may be performed by:

(a)	Electricians only	78=96%
(b)	All skilled trades personnel	2=2%
(c)	Anyone needed to lock-out equipment	2=2%

22. Stored energy cannot always be locked out:

(a)	True	72=87%
(b)	False	10=13%

23. Stored electrical energy is present in batteries:

(a)	True	78=95%
(b)	False	4=5%

24. Mechanical motion/energy must be:

(a)	Controlled	68=83%
(b)	Dissipated	14=17%

25. The word verify means:

(a)	Make sure	6=7%
(b)	Double-check	6=7%
(c)	Both of the above	70=86%

26. When working in a team, you should verify that each person has placed a safety lock on each appropriate disconnect:

(a)	True	78=95%
(b)	False	4=5%

SAFETY KNOWLEDGE EVALUATION SURVEY II

1. How often do you lockout power and control energy before you work in a machine or on equipment?

1	Always	38=47%
2	More often than not	28=34%
3	Sometimes	8=10%
4	Occasionally	2=2%
5	Hardly ever	6=7%

2. How often are departmental locks used at your plant when, equipment, machines, or operations will be down into the next shift or longer?

1	Always	48=59%
2	More often than not	14=17%
3	Sometimes	14=17%
4	Occasionally	
5	Hardly ever	6=7%

3. When is it necessary for everyone working on operations or equipment to put their lock on the power or energy source?

1	Always	52=64%
2	More often than not	10=12%
3	Sometimes	8=10%
4	Occasionally	6=7%
5	Hardly ever	6=7%

4. Before starting a job, how often do you consciously evaluate the consequences of not doing the job safely?

1	Always	27=33%
2	More often than not	33=40%
3	Sometimes	16=20%
4	Occasionally	2=2%
5	Hardly ever	4=5%

5. How often, because of the pressure to get the job back in operation, do you not lockout or control power and energy?

1	Always	14=18%
2	More often than not	8=10%
3	Sometimes	10=12%
4	Occasionally	10=12%
5	Hardly ever	40=48%

6. In the last month, before I worked on a machine, operation, or equipment, I locked out power and controlled energy?

1	Always	44=54%
2	More often than not	22=27%
3	Sometimes	4=5%
4	Occasionally	2=2%
5	Hardly ever	10=12%

7. When is it OK to loan your lock to a fellow worker?

1	Never	80=98%
2	Occasionally	
3	Sometimes	2=2%
4	More often than not	
5	Always	

8. How often does a worker in your plant not lockout all sources of power and energy because they do not have enough locks?

1	Never	42=52%
2	Occasionally	28=34%
3	Sometimes	10=12%
4	More often than not	2=2%
5	Always	

9. In your work assignments, how often is it impossible to lockout or control all sources of power and energy?

1	Never	46=56%
2	Occasionally	18=22%
3	Sometimes	14=17%
4	More often than not	
5	Always	4=5%

Circle the number next to the answer that best reflects your answer to the following questions.%

10. As soon as you have decided to lockout, you should first:

1	Do it immediately	4=5%
2	Communicate with necessary personnel	52=64%
3	Prepare the area	26=31%

11. Preparing the area for lockout means:

1	Checking the hazards	6=7%
2	Doing something about the hazards	6=7%
3	Both of the above	70=86%

12. Before locking out a specific machine, it is important to decide whether adjacent machinery requires lockout too.

1	True	76=93%
2	False	3=7%

13. Once you have worked on a piece of machinery a few times and know it well, you can assume you can always lock it out safely?

1	True	49=60%
2	False	33=40%

14. Once you know the principles of lockout, you should be able to lockout any machine?

1	True	72=88%
2	False	10=12%

15. Effectively locking out a machine fed by multiple energies often requires that you use more than one lock.

1	True	80=98%
2	False	2=2%

16. In locking out air, oil, water, steam, or gas under pressure:

1	Must be dissipated	60=73%
2	Must be released	22=27%

17. Which of the following are proper disconnect points for a pneumatic system?

1	Piston valve	
2	Handle/lever valve	6=7%
3	Gate valve	6=7%
4	All of the above	70=86%

18. Which of the following are acceptable electrical disconnects?

1	- On-off button	
2	- Selector switch	2=2%
3	- Toggle switch	
4	- Manually operated disconnect switch which can be	
	Locked in the off position	80=98%

19. Stored energy can always be locked out?

1	True	35=43%
2	False	47=57%

20. Mechanical motion must be:

1	Controlled	71=87%
2	Dissipated	11=13%

21. Gravity must be:

1	Controlled	74=90%
2	Dissipated	8=10%

22. Stored mechanical energy in springs may be controlled or dissipated?

1	True	70=85%
2	False	12=15%

23. Safety blocks are built to withstand the force of the cycling?

1	True	72=88%
2	False	10=12%

24. When releasing hydraulic pressure, it is sometimes necessary to check, that the pressure has been released by breaking the line at a fitting connection?

1	True	72=88%
2	False	10=12%

25. When making sure that pneumatic energy is absent, pressure gauges alone are enough to tell you that the pneumatic energy is absent?

1	True	34=44%
2	False	44=54%

26. When working in a team you should make sure that each person has placed a safety lock on each appropriate disconnect?

1	True	72=88%
2	False	10=12%

27. If you have to leave a job site after controlling and locking out power and energy and making sure that power and energy are absent, then as soon as you return to the job you should:

1	Continue work	6=7%
2	Again make sure power and energy are controlled and locked out	76=93%

28. When pulling electrical disconnect switches you should:

1	Face away from the cabinet box or panel	76=93%
2	Face the panel box or cabinet	6=7%

29. If you intend to work in a confined space that has a carbon dioxide fire extinguishing system, you should lock the system out before entering the confined space?

1	True	76=93%
2	False	6=7%

30. Whenever you need to lockout, all you should concern yourself with is locking out the machine on which you are working?

1	True	53=65%
2	False	29=35%

31. It is your responsibility to make sure that any safety guards you removed during your work are put back properly after your work is done?

1	True	80=98%
2	False	2=2%

DEMOGRAPHICS EVALUATION SURVEY	
1. Your age is:	
1 - Less than 25	2=3%
2 - 25-35	18=21%
3 - 36-45	27=34%
4 - 46-55	33=39%
5 - 56 or older	2=3%
2. Race:	
1 - White	66=80%
2 - Hispanic	4=5%
3 - Native American Indian	8=10%
4 - Asian or Pacific Islander	0=0%
5 - Black	4=5%
6 - Other	0=0%
3. Sex:	
1 - Male	82=100%
2 - Female	0=0%

4. Job Title Information:

Job Title	Department			%Participants
	Production	Maintenance	Shipping	
Supervisors	2	2	0	5
Control man	4			5
Reactor Operator	8			10
Wet Process	8			10
Technician		4		5
Electrician		2		3
Welder		4		5
Repairman		6		7
Painter/Carpenter		2		3
Forklift Operator		1	3	5
Warehouse		1	1	3
Crewman		6	21	32
Building		1	2	3
Printer			1	1
Loader			1	1
Valve Packer			2	2
Total	22	29	31	100%

PERSONAL OPINION SUPERVISION EMPHASIS SURVEY

Please circle the correct response. What attention or emphasis is given to the following by your supervisor?

(Needs Attention)

The quality of your work	Too Much	OK	Too Little	NA
	2=2%	74=91%	2= 2%	4= 5%
Costs involved in your work	Too Much	OK	Too Little	NA
	2= 2%	72=88%	8=10%	
Meeting schedules	Too Much	OK	Too Little	NA
	4= 5%	68=83%	4= 5%	6= 7%
Getting your reactions and suggestions	Too Much	OK	Too Little	NA
		36=44%	40=49%	6= 7%
Giving you information	Too Much	OK	Too Little	NA
		36=44%	36=44%	10=12%
Getting full use of your abilities	Too Much	OK	Too Little	NA
		50=61%	22=27	10=12%
Safety and housekeeping	Too Much	OK	Too Little	NA
	56=68%	20=25%	6= 7%	
Development of subordinates	Too Much	OK	Too Little	NA
	2= 2%	34=42%	34=42%	12=14%
Innovations & new ideas	Too Much	OK	Too Little	NA
		33=40%	39=48%	10=12%
Effective teamwork among subordinates	Too Much	OK	Too Little	NA
		38=48%	37=45%	6= 7%
Employee's commitment to workplace safety	Too Much	OK	Too Little	NA
		70=88%	10=12%	
Company's commitment to workplace safety	Too Much	OK	Too Little	NA
		54=66%	28=34%	
Safety practices & procedures are followed	Too Much	OK	Too Little	NA
	72=88%	8=10%	2= 2%	

APPENDIX C
DEMOGRAPHICS

To characterize the participant group of the facility regarding demographic data collected. The demographic data included age, race, sex, and job title by classification. The breakdown results are as follows:

Age:

1.	Less than 25 years old	=	2 or 3%
2.	25 - 35	=	18 or 21%
3.	36 - 45	=	28 or 34%
4.	46 - 55	=	32 or 39%
5.	56 or older	=	2 or 3%

Race:

1.	White	=	66 or 80%
2.	Hispanic	=	4 or 5%
3.	Native American Indian	=	8 or 10%
4.	Asian or Pacific Islander	=	0 or 0%
5.	Black	=	4 or 5%
6.	Other	=	0 or 0%

Sex:

1.	Male	=	82 or 100%
2.	Female	=	0

Job Title Information:

Job Title	Department			%Participants
	Production	Maintenance	Shipping	
Supervisors	2	2	0	5
Control man	4			5
Reactor Operator	8			10
Wet Process	8			10
Technician		4		5
Electrician		2		3
Welder		4		5
Repairman		6		7
Painter/Carpenter		2		3
Forklift Operator		1	3	5
Warehouse		1	1	3
Crewman		6	21	32
Building		1	2	3
Printer			1	1
Loader			1	1
Valve Packer			2	2
Total	22	29	31	100%

The research required that the respondents complete a designed questionnaire to determine their attitude toward their feelings on safety responsibility in the workplace. Attitude and behavior on the job is very important for controlling accidents in the workplace.

QUESTIONNAIRE RESPONDENTS

The questionnaire respondents were employees of a manufacturing facility. They were unionized hourly workers and skilled trade-persons, salaried and supervisory personnel at a facility located in Oklahoma. All of the respondents have had numerous safety instruction classes that included personal protective equipment, fire safety, respiratory safety, eye safety, energy control and power lockout, as well as attending informative weekly safety meetings. About 82 people were selected to participate in the questionnaire program, of which 82 people completed questionnaires as presented to them during a wrap up of the safety meetings. The participation was strictly voluntary. These employees have a true dedication to their job and are paid well and plan to stay there until retirement. There is rarely turnover in this location with not more than one or two person being hired per year due to attrition, etc.

APPENDIX D

Institutional Review Board

Oklahoma State University
Institutional Review Board

Protocol Expires 3/20/1998

Date: March 21, 1997

IRB Application No: ED-97-059

Proposal Title: WHAT IS EMPLOYEES' AND MANAGEMENT'S PERCEIVED ROLE AND RESPONSIBILITY FOR WORKPLACE SAFETY IN RELATION TO JOB SATISFACTION?

Principal
Investigator(s):

~~Clyde B. Knight~~
College of Education

Robert A. Howard
801 Monument Road
Ponca City, OK 74604

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,


Carol Olson, Chair
Institutional Review Board

#2

VITA

Robert A. Howard

Candidate for the Degree of
Doctor of Education

Dissertation: PERCEPTIONS OF RESPONSIBILITY FOR WORKPLACE SAFETY
IN A MANUFACTURING ENVIRONMENT.

Major Field: Occupational and Adult Education

Biographical:

Education: Attended Tonkawa High School, Tonkawa, OK and graduated from American High School; received a Bachelor of Liberal Studies degree from the University of Oklahoma in 1992; received a Master of Human Relations degree from the University of Oklahoma in 1993; and in 1994 began working on a doctorate at Oklahoma State University.

Personal Data: Born in Oklahoma City, Oklahoma, the son of Lloyd R. Howard and Geraldine M. (Glaser) Howard.

Experience: Raised on a farm in the Ponca City and Tonkawa communities. Graduated from Pioneer Technology Center as an industrial Electrician in 1972 and worked about 15 years as an industrial electrician. Holding active state licenses as mechanical contractor, journeyman electrician, and Realtor Associate. Served as union president, treasurer and chief union negotiator for several years representing workers locally and nationally. In addition, worked as a supervisor, safety professional, and human resource manager for a corporation for the last 15 years. Certified mediator for the Oklahoma Supreme Court. Served as chair of the Local Workforce Development Council, St. Mary's Catholic Church, chair of Chamber of Commerce Infrastructure, board member of Cherokee Strip Credit Union and Pioneer Technology School Board member. Always being active in other community organizations.

Professional Memberships: Oklahoma Vocational Education, Ponca City Leadership, Ponca City Chamber of Commerce, and Ponca City Human Resource professionals.