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In Texas nonsubscribers to workers' compensation have been under ongoing attack as powerful interest groups such as casualty insurance carriers have lobbied for an end to the elective system. Seventy-two nonsubscribing Texas companies were surveyed. Logistic regression with an alpha level of p=0 .05 found the safety program qualitative score, Wald (1)=10.1992, p=0.0014 to be a significant predictor of increased management attention to safety while the other variables of total losses, frequency rate, and severity rate together in the same model were found to not be significant predictors of the same dependent response. Eighty-one percent of organizations surveyed reported that management attention to safety had increased after the company became a nonsubscriber.

THE EFFECT OF SELF ADMINISTERED WORKERS'

COMPENSATION ON EMPLOYEE

SAFETY PROGRAMS

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THE EFFECT OF SELF ADMINISTERED WORKERS' COMPENSATION ON EMPLOYEE SAFETY PROGRAMS

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Safety management, as a concept and practice, has been in transition since its beginning. More than 2,000 years before the Christian period, ancient Babylon concerned itself with the accidents of the time and outlined a method for indemnifying the injured. Hammurabi in 2100 B.C. during the 30th year of his reign dictated a body of laws which were carved into a diorite column in 3,600 lines of cuniforms. Included in the civil law outlined by Hammurabi were various safety and indemnification related requirements. For example the owner of an ox which gored a man on the street was responsible for damages if the ox was known to be vicious. The code of Hammurabi provides significant evidence that there was awareness at least 4,000 years ago of the need for adjusting and controlling unwanted losses. Unfortunately, the code also espoused the ancient eye-for-an-eye principle which set forth a future pattern for occupational safety management. This is essentially a negative pattern which attempts to maintain control, whether on the federal, state, local, or shop floor, by the explicit threat of punishment equal to the severity of the offense (Grimaldi & Simonds, 1989, p. 28). It leaves one to wonder whether the course of workplace safety might have been different if Hammurabi had not chosen to attack the hazard problem negatively.

A more positive approach is viewing hazard control as a normal administrative function that is essential to the minimization of needless risks. The code probably contributed to the familiar notion that authoritative government regulations and the threat of discipline for violations are the principal means of furnishing safety (Grimaldi &

Simonds, 1989, p. 29). More recently safety management has shifted from what once was little more than a plain sense approach to eliminating agents of injury to what now is quite often a complex approach to the reliable control of harm (Grimaldi & Simonds, 1989, p. 3). There is clear and extensive evidence that a good safety program can reduce occupational injuries, illness, and the attendant operating costs to a small fraction of what they would be otherwise (Grimaldi & Simonds, 1989, p. 5).

As the industrial revolution grew in the U.S. large corporations and other employers did much to press government and legislators against passage of any safety laws to protect workers because of the high costs for accident prevention measures. Over the years, this attitude has lessened somewhat, especially where a corporation finds safety is economically beneficial for business. Since corporations and their managers are shielded against personal liability claims for accidents by insurance policies much of the incentive to provide safe workplaces has been somewhat negated. As a result, worker safety and health has been compromised with the occurrence of more deaths and injuries than there should have been (Hammer, p. 2).

Workers' compensation insurance was developed on the social premise that employers are better equipped than employees to bear the financial burden resulting from occupational injuries and diseases. Under this system, which varies somewhat from state to state, an injured or disabled employee is guaranteed recompense for employment-related economic loss. As a result, workers' compensation is often considered the first form of social insurance in the United States. Yet workers' compensation is not truly

socialized because the federal government does not have centralized control and administrative power. Instead workers' compensation is essentially a private enterprise fueled by insurance companies (Workers' Compensation, 1986, p. 5). The emergence of workers' compensation insurance programs paralleled the industrial revolution and the resulting social issues from work related injuries. Under the common law that existed prior to and immediately following the Industrial Revolution, an employer who was negligent was held responsible for injury to or death of a worker. However, an employer's negligence could be established only if an injured worker sued the employer and proved negligence in court. The burden of proof borne by the employee, with the costly, slow moving legal process and uncertainty of outcomes, resulted in many cases in which injured employees were able neither to pay for medical care nor to return to work. As a result, workers and their families both suffered. Society eventually was pressed to find a solution to this dilemma (Workers' Compensation, 1986, p. 3). At the turn of the century, many states adopted employers' liability acts that were designed to modify common law defenses and improve the position of the employee. Some of the traditional common law defenses included assumption of risk, contributory negligence, and the fellow servant rule. Assumption of risk is the doctrine stating that a company in not liable for an employee injury if the person was aware of the inherent hazards of the job. Contributory negligence is the defense that says the injured employee's own negligence contributed to the accident. The fellow servant rule was utilized as a liability defense when another employee's negligence was responsible for the employee's work related injury (Workers'

Compensation, 1986, p. 50).

The common law and legal environment of that time soon proved these acts to be ineffective, since injured workers were still required to prove negligence. Society began to view the employee's burden of negligence as an injustice. These perceived injustices led to the development of the workers' compensation system first in Germany in the 1880's, next in Great Britain, and finally in Wisconsin, USA in 1911. Other industrialized states followed soon after Wisconsin in passing workers' compensation legislation (Workers' Compensation, 1986, p. 4). Workers' compensation essentially was a tragic byproduct of the industrial revolution. The unprecedented economic and technological breakthroughs of the 19th century were accompanied by an enormous increase in work-related accidents (Briffault& Kramer, 1991, p. 1). This trend has continued into the 20th century when from 1979 to 1989 workers' compensation insurance premiums rose 108% and claim costs skyrocketed 154%.

Premiums and claims for workers' compensation have far out paced accident rate increases in all industries (Briffault& Kramer, 1991, p. 3). The introduction of workers' compensation brought with it an important new legal concept, liability with no regard as to who is at fault. There is a great similarity between this concept and present-day pure no-fault auto insurance (Workers' Compensation, 1986, p. 7). In some regards the workers' compensation system has been a successful social experiment. It benefits both insured employers and employees. Employers gain the predictability of cost for job-related injuries in the cost of insurance to cover both their no-fault liabilities and their common

law liabilities and employees gain a definite amount of recompense through workers' compensation benefits without legal recourse under the exclusive remedy doctrine for covered items (Workers' Compensation, 1986, p. 10).

One of the intentions of the proponents of workers' compensation legislation was the premise that workers' compensation premiums would advance occupational safety programs. It was believed that the costs of workplace injuries and illness which would be imposed on the shop owner in the form of workers' compensation insurance premiums would motivate the employer to institute safety programs as defense against increasing costs. The workers' compensation insurance industry proliferated when states began to pass laws requiring that most employers establish the ability to carry the burden of paying any workers' compensation judgements. This legal requirement created the business opportunity for casualty insurance companies to sell policies which would provide employers with this security (Grimaldi & Simonds, 1989,p. 38). Today most employers in the United States purchase workers' compensation insurance to meet their state mandated indemnification requirements.

The advent of workers' compensation legislation doubtlessly boosted industrial safety more than any other factor at the time. Insurance companies sent out legions of safety inspectors to reduce the risks of underwriting and to increase their profits. With the concept of fault removed as a basic factor for consideration in workplace injury indemnification, it clearly encouraged employers to take definite steps to control hazards, and the insurance companies played a major role in this. Popular methods in safety

engineering were largely the outgrowths of casualty insurance company's inspectors making recommendations to their insureds. Industry relied heavily on the insurance industry for the advancement of workplace safety concepts with some organizations content to allow the insurance company engineer to take the brunt of the burden for the implementation of safety (Grimaldi & Simonds, 1989, p. 39).

The introduction of workers' compensation insurance requirements and the carrier's safety service were not sufficient to reduce workplace injuries to an irreducible minimum. One handicap was the often cited employer's opinion that the purchase of workers' compensation insurance absolved them of their safety responsibilities. It was assumed that accidents became the concern of the insurance carrier because the carrier had contracted to pay their costs. Therefore the cost reduction incentive that underlies many safety programs appeared not to be a pressing issue (Grimaldi & Simonds, 1989, p. 39). Further developments in occupational safety and health occurred in the passage of the Occupational Safety and Health Act in 1970 which codified safety requirements for general industry, maritime operations, and construction (Grimaldi & Simonds, 1989, p. 51).

There is no question that laws, regulations, and the provisions for their enforcement largely have ameliorated the occurrence of harm. However, the results have certainly not been satisfactory (Grimaldi & Simonds,1989,p. 52). In 1992, state and federal workers' compensation programs consumed more than $62 billion. This figure is more than 100 times greater than the combined budgets of the three primary federal

agencies whose aim is to reduce workplace injuries (Spieler, 1994, p. 121). At the same time, available data appear to indicate that injury severity has not declined during this period of exploding workers' compensation costs (Spieler, 1994, p. 122). It would seem reasonable to expect that increasing workers' compensation costs would stimulate employers to engage in efforts to prevent occupational injury and illness. However there is no persuasive evidence that this is true (Spieler, 1994, p. 123). Neither aggregate safety data nor more focused studies give strong support to the claim that the high costs of workers' compensation have motivated large numbers of employers to take injury prevention activities seriously. This contrasts with the empirical studies which show that employers with aggressive safety programs often exhibit lower, sometimes substantially lower, workers' compensation costs with these reductions in costs more than offsetting the cost of the safety initiatives (Spieler, 1994, p. 123).

For safety to truly be embraced by an organization the costs of accidents must be close enough to management's span of control and a decisive negative to the bottom line. In order to maximize the deterrent effect of liability accident costs must be charged to and internalized by the organization responsible for the harm (Spieler, 1994, p. 185). Traditional workers' compensation insurance costs are presented as an aggregate cost to the insured. As depicted in Figure A1 aggregate cost is unlikely to provide the necessary incentive for organizations to increase their attention to workplace safety (Spieler, 1994, p. 185). The no fault workers' compensation system insulates employers from recognition of their responsibility for workplace safety and also promotes the employer attitude that

employees' behavior is the primary cause of workers' compensation claims. This worker at fault paradigm confounds any discussion of the relationship between costs and prevention of injuries, as the focus on the employee's actions keeps the employer from looking at their own faulty management systems and workplace culture (Spieler, 1994, p. 189). The internal and external economic forces that affect a corporation's bottom line performance dictate the items that receive management attention. Companies with traditional workers' compensation insurance may have a tendency to be more passive toward the concepts of fraud, post injury return to work, and workplace safety with the assumption that the casualty insurance carrier is responsible for monitoring these issues.

In Texas, an alternative to traditional workers compensation has developed known as nonsubscription or rejecting the established state system in favor of a self managed program. Since 1913 Texas' workers' compensation law has allowed nongovernmental employers the option of rejecting workers' compensation coverage and becoming nonsubscribers to the traditional system. As detailed by Figure A2 nonsubscribers can be sued for damages based on negligence for work-related injuries without having the benefit of common law defenses such as assumption of risk, contributory negligence, and the fellow servant rule. It is this threat of tort-based lawsuits and the "nearness to injury costs" that serves to cause more active employer efforts in the areas of fraud, post injury return to work, and safety. In 1917 the U.S. Supreme Court declared mandatory as opposed to elective worker compensation statutes constitutional which effectively encouraged most states to adopt mandatory workers' compensation laws (Workers'

Compensation Research Center, 1995, p. 3). Currently, approximately 150,000 employers in Texas have rejected the traditional workers' compensation system (Pioneer Institute for Public Policy Research, 1995).

The Problem

The nonsubscriber community has been under recent political attack prompted by large insurance carriers who desire to make workers' compensation insurance mandatory for all Texas employers. The nonsubscribers often cite improved workplace safety as a defense and a reason for continuing to allow companies to opt out of the system (Bent, 1997, p. 6). The basis of the nonsubscriber safety argument is that when a company manages the costs of workplace injuries in a direct and responsible way, it will seek to maximize profits while minimizing controllable losses, this inevitably leads to enhanced employee safety and health.

Occupational safety and health programs in the United States have not been well studied to date. There are various management theories advocating various ways to construct, implement, and manage safety programs as well as several widely accepted concepts that provide a framework for an effective program. The nonsubscriber issue has received much in the way of comprehensive research and focused studies but none to date have focused entirely on the effect of nonsubscription and management attention to workplace safety.

Rational for Selection

Texas is currently the only state in which workers' compensation is truly elective for all private employers. South Carolina was previously the only other nonmandatory workers' compensation state with a large number of employers opting out of the system, but its laws changed in May 1996 making coverage mandatory for all employers. New Jersey, while technically not a mandatory state, is effectively so by design (Research and Oversight Council, 1996, p. 1). Employers who provide workers' compensation insurance are referred to as "subscribers" while those who do not are known as "nonsubscribers". The key advantage of workers' compensation coverage is immunity from lawsuits under the "no fault" system. Nonsubscribers do not have this benefit and are liable under the tort system for injuries sustained by employees (Research and Oversight Council, 1996, p. 1). Legislation passed in 1989 effectively overhauled the existing Texas workers' compensation system. The new legislation has been described as creating a system that was conceived in crisis and born in compromise (Texas Sunset Advisory Commission, 1994, p. 1). In 1987 Texas had the highest workers' compensation rates, lowest benefits, and worst record for workplace deaths and injuries (Texas Sunset Advisory Commission,1994, p.1). In 1992, 114,000 claims were filed in Texas totaling $3.3 billion in losses. The state spends $39.9 billion to administer workers' compensation (National Institute of Occupational Safety and Health, 1997).

A statewide survey of businesses in 1993 showed that 44% of Texas workplaces were nonsubscribers, employing 20% of the Texas workforce. A 1995 survey, based on a

different methodology, found almost identical results for the overall rate of workers' compensation rejection (Research and Oversight Council, 1996, p. 1). The 1996 survey showed that an estimated 39% of Texas employers do not have workers' compensation insurance with an estimated 20% of the workforce represented (Research and Oversight Council, 1996, p. 5). The 1996 survey indicates that the status of worker compensation coverage is very much related to size of the employer. Large employers were found to be more likely to subscribe to the workers' compensation system than smaller employers. Estimated nonsubscription rates are highest for employers with 1 to 4 employees at 44% and are lowest for firms with 500 or more employees at 14% (Research and Oversight Council,1996, p. 6).

Differences exist in the nonsubscription rates among employers in different industries. The retail and agricultural industries had the highest nonsubscription rates in 1996 with 51% respectively. Mining and finance industries had the lowest nonsubscription rates with 20% and 28% respectively (Research and Oversight Council,1996, p. 7). Forty percent of manufacturing firms were found to be nonsubscribers with the proportion of employees working in this category at 12%. This reflects the fact that larger employers, regardless of industry, are more likely to obtain workers' compensation coverage (Research and Oversight Council,1996, p. 8). Cost is cited as the primary reason nonsubscribers decide not to carry workers' compensation insurance (Research and Oversight Council,1996, p. 11). For nonsubscribers with 50 or more employees, 38% reported having at least one lawsuit in the last five years as a result

of an occupational injury. Correspondingly, fear of a lawsuit was given the most frequently as the primary reason for purchasing workers' compensation insurance (Research and Oversight Council,1996, p. 29).

Workers' compensation has been under fire from business due to escalating medical costs, widespread fraud and abuse, cumbersome regulations, and a convoluted system of administering claims and benefits. With the advent of managed care networks to lower medical insurance payments, workers' compensation is described as the last "fee for service" medicine. Nationally, workers' compensation costs began spiraling upward in 1975 when the annual costs approached $2 billion. In 1992 costs topped out at $60 billion with $16.7 billion of this total for medical costs. Many states are beginning to set up or allow for the setting up of workers' compensation medical care networks to lower the medical costs (Cerne, 1994, p. 51). As efforts to control workers' compensation costs through improved utilization and managed care concepts are growing, the prevention side, primarily in the form of occupational safety and health programs has continued to develop as well. The prevention side truly holds the most economic value for business. Attempts to manage medical care are strictly attempts at pure cost control whereas occupational safety and health is truly preventive in nature. When the indirect and direct costs of accidents are taken into account safety programs increase in their relative impact on the bottom line versus the strictly medical cost containment programs.

When companies in Texas elect not to carry workers' compensation insurance many implications can be made as to why this action occurred. The typical number one

issue is a desire to save money from the workers' compensation premium. Another reason companies opt out of the system is to seek an alternative benefits plan for their employees (Research and Oversight Council, 1996, p. 11). What this perhaps in reality means is the employer wants to have direct management and control of its occupational injuries with injured employees only ultimate recourse being a lawsuit with no state appeal boards, rights to certain choices in providers, etc. This again is an economic reason for nonsubscription. It is my premise that when a responsible nonsubscriber takes on the added risk of not having workers' compensation insurance protected by an exclusive remedy system, the responsible nonsubscriber will strive for prevention of loss through strong employee occupational injury and illness programs. In the management of a company, what often tends to get management's attention the most are those items viewed as controllable and as having direct bottom line impact. Businesses look for ways to save on costs and increase profit margins. Many companies today find strong employee safety and health programs as a way to reduce expenses and increase profit margins (Crown-Cyr & Fleming, 1997, p. 10). A responsible nonsubscriber feels the impact of injuries in a more direct way, as each injury may typically be paid for out of a departmental budget. A company under traditional workers' compensation sees an annual bill for premium costs with this usually being reflective of all accident losses combined from the previous year.

Research Questions

The major research focus of this study compared nonsubscriber safety programs to Texas Workers' Compensation Commission recommended guidelines and analyzed

responses from management representatives of nonsubscribers regarding the perceived effect of their self insured status on injury frequency, severity, claim costs, and management attention to safety.

Definition of Terms

Nonsubscriber- An employer who rejects the state's workers compensation system in favor of their own, self managed method.

Responsible nonsubscriber- A nonsubscriber to workers compensation who offers an alternative injury benefit program which is often similar in design to traditional workers compensation benefits. Employers often will register their alternative benefit programs under the Federal Employee Retirement and Income Protection Act (ERISA), effectively shielding themselves from state intervention.

"Going Bare"- A nonsubscriber to workers compensation who does not offer an alternative to traditional workers compensation benefits. They take their chances with employee injuries in the court system under the negligence doctrine.

TXANS- Texas Association of Responsible Nonsubscribers.

ERISA- Employees Retirement and Income Security Act. Federal Law governing benefit packages set up by corporations. Helps companies avoid state intervention with their benefit's packages.

OSHA- Federal Occupational Safety and Health Act or Agency.

Oversight and Research Council- State sponsored group that studies subscriber and nonsubscriber issues and makes recommendations to the legislative bodies concerning

workers compensation reforms.

TWCC- Texas Workers Compensation Commission

Review of Literature

Although various research studies have been completed on Texas nonsubscribers few to date have specifically focused on employee safety programs. The one that has come the closest in similarity to my project is titled "A Study of Nonsubscription to the Texas Workers Compensation System: The Employee Perspective" by the Public Policy Research Institute of Texas A & M University for the Texas Workers' Compensation Center in August 1994. The study focused primarily on the employee's perception of whether alternative benefits were available and the employee's understanding of these benefits. A secondary focus was on the nonsubscriber and subscriber employee's perception of employer efforts to encourage safety. Surveys were done of subscriber employees in order to set a baseline of comparison for the nonsubscriber responses. Seventy-one percent of employees of subscribers and 57% of employees of nonsubscribers surveyed saw their employers as likely to expend a "great deal" of effort to make their workplace safer. Additionally, 60% of employees of subscribers and 48% of employees of nonsubscribers reported that their employers conducted safety training or safety meetings (Public Policy Institute, 1994, p. 2).

A study by Richard Butler of the University of Minnesota published in the September 1996 Journal of Risk Management titled "Lost Injury Days: Moral Hazard Differences Between Tort and Workers' Compensation" compared the injury frequency

rates of subscribers and nonsubscribers. Butler's results showed nonsubscribers to have slightly higher injury rates, but shorter lost-work day durations, and fewer sprains and strains reported than those companies in the workers' compensation sector (Butler, 1996, p. 1). In order to reduce possible bias in reporting of accidents Butler also compared fatality rates between subscribers and nonsubscribers. His reasoning was that fatalities are always reported whereas there may be great discrepancies in the reporting of injuries and illness. Butler describes fatality rates as the "real" measure of workplace safety and he found the "real" level of workplace safety to be slightly better for nonsubscribers with the exception of mining, transportation, and finance (Butler, 1996, p. 4). Butler attempts to explain the workplace safety advantage enjoyed by nonsubscribers as being a result of the possibility of tort actions by employees. Butler interviewed several nonsubscribing firms and found that many larger nonsubscribing firms have adopted safety measures that have substantially reduced the real level of job risk at their firms (Butler, 1996, p. 22). Butler examines in-depth the concept of workers compensation having inherent "moral" hazards in that employees and medical providers may use the system to their distinct economic advantage whereas the nonsubscriber community has certain immunities from moral hazards by maintaining more direct control of work related injuries.

A survey of responsible nonsubscribers in 1995 by Abilene Christian University found that of those who responded to the survey 93.1% had a written safety plan, 94.1% had formal workplace training programs, 93.1% held regular safety meetings, 77.5% reported their safety programs to be better than when they were subscribers to workers

compensation. Likewise respondents indicated the use of safety meetings, training, and safety personnel increased when they became nonsubscribers (School of Business-Abilene Christian University,1995).

A 1995 comprehensive membership survey conducted by TXANS leadership showed that 64% of respondents said better job safety was a very important factor in keeping the company out of the Texas Workers' Compensation system. Four percent reported this as the most important factor with the majority reporting high worker compensation premiums as the most important reason for staying out of the traditional workers' compensation system. Ninety- three percent reported having a written safety program, 70% reported using safety incentive programs, 96.1% reported that the safety plan was communicated to employees, 79.8% reported the company holds regular safety meetings for supervisors, and 90.2% reported to hold regular safety meetings for employees. Sixty- two of the respondents said they use safety committees, and 61.7% utilize the services of a safety professional or industrial hygienist (TXANS, 1995)

In 1988 the W.E. Up john Institute for Employment Research completed a major study of workers' compensation claims for the State of Michigan. The study concluded that considerable variation exists in worker compensation claim's incidence and that a significant portion of the variance among employers is due to policy and behavioral differences that are under the organization's control (Spieler, 1994, p. 156). This study also concluded that low claims employers engage in systematically different patterns of behavior to prevent and manage work related injuries. The introduction of this report

notes that accident prevention is the key element in controlling occupational injuries. The Up john study indicates that workers' compensation costs and claims experience are within the autonomous control of organizations but the study does not attempt to explore why the corporate culture and safety practices of some employers differ markedly from others (Spieler, 1994, p.157).

In 1993 the Insurance Research Council completed a mail survey of 3,200 U.S. small business owners in order to better understand how employers view their role in workplace safety. Thirty-three percent of respondents indicated that the most important motivation for taking safety actions was to increase profits by reducing losses (Insurance Research Council, 1995, p. 3). Fifty-nine percent rated the cost of workers' compensation as a "very important" factor in motivating actions to improve workplace safety (Insurance Research Council, 1995, p. 19). Eighteen percent rated costs as "very important" reason limiting additional safety measures (Insurance Research Council, 1995, p. 21). Forty-five percent of business owners surveyed believed that workplace safety is a significant management issue (Insurance Research Council, 1995, p. 29). This survey shows the importance of economic factors in the implementation of workplace safety programs and control measures.

Nine prior studies have shown that increasing workers' compensation benefits is significantly correlated with increases in injury rates (Spieler, 1994, p. 128). Worral and Appel (1982) estimated that a 10% increase in the wage replacement rate for injured workers will lead to a six percent increase in the number of indemnity claims relative to

medical only claims (Butler, 1996, p. 21). These studies bring to light the negative consequences of inherent "moral hazards" associated with workers' compensation systems. Moral hazards arise when the availability of a monetary benefit leads to increased attempts to obtain it by employees and medical providers as well (Butler, 1996, p. 21).

Case Study[1]

Some of the studies discussed in the literature review show various trends observed in the nonsubscriber population but to really understand the dynamics of the Texas workers' compensation issue it is valuable to look at the experiences of a single nonsubscriber. Atco Rubber Products, Inc. is a nonsubscriber to the Texas workers' compensation act. Atco Rubber Products, Inc. manufactures flexible air duct and operates 13 manufacturing plants in the U.S. with 1,100 employees. Atco's corporate headquarters is located in Fort Worth, Texas along with two production plants that support a total Fort Worth employee base of 450. Another production plant is located in Houston with 30 employees. The company has had a presence in Texas since 1978 when the corporate headquarters was relocated from Michigan. The company has undergone steady growth since its inception approximately 30 years ago. Texas has played a major role in the success of the company.

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[1] Information contained in the case study was derived from interviews and discussions with Atco management as well as my personal experiences as the Corporate Safety Coordinator of Atco Rubber Products, Inc. (1995 to current).

The majority of duct components are made in Fort Worth and are shipped to smaller assembly plants located strategically around the United States. The company faced a workers' compensation crisis in Texas during the late 1980's when it was facing a premium of nearly $1,000,000 per year to finance its coverage for just Texas locations alone. Loss experience had not been favorable through the 1980's and the archaic Texas Workers' Compensation system was not helping the situation. Loss experience for Texas companies as a whole was not favorable either which further fueled the fire for increased premiums as casualty carriers struggled to maintain their profits in this state. Atco had actually been denied workers compensation coverage due to its unfavorable risk status in 1990 and was faced with joining the state's assigned risk pool at the expense of a large premium. The company was aware of the growing trend in Texas for companies to reject the state's workers' compensation act and elect to carry a deductible with an excess risk insurance carrier or carry the risk in its entirety and fight any injury lawsuits on their own. Companies who rejected the act could also elect to set up their own injury benefit plans under the Employees Retirement and Income Security Act- in order to avoid state intervention- or provide no benefits at all. Generally those who provide benefits are viewed as responsible nonsubscribers.

Atco faced a significant decision in 1990. They could pay the high premium for coverage in Texas which ultimately would have stunted the company's future growth and success, elect to reject the act and carry excess risk with a large deductible, or shift its production capacity out of the state of Texas and relocate in states with more favorable

workers' compensation systems and premiums. The company president elected to reject the Texas Workers' Compensation Act, pick up some excess risk insurance with a large deductible, set up an ERISA registered occupational injury benefits plan, and take his chances with the Texas courts. The ERISA benefits plan for industrial injury is similar in concept to regular workers' compensation with a slightly better indemnity package of 85% of weekly wage versus the state's 70% schedule for any lost time injuries.

The decision was made primarily by balancing the perceived advantages with the possible disadvantages. The primary advantage was a significant immediate cost savings by using the large deductible in lieu of paying the standard workers' compensation insurance premium. If employee injuries could be effectively prevented and managed, the self insurance option with the excess risk coverage would have a decisive economic advantage for the company. This would be accomplished primarily through the employee safety program. The company realized by rejecting the exclusive remedy solution of traditional workers' compensation that significant loss exposure could occur if accident frequency and severity were not effectively managed. To date, the economic benefits of the change have far exceeded the risks involved. A workplace culture has evolved that places a strong management emphasis on employee safety and health. In order to deal with the increased risks of self insurance, the company's safety program has received ever increasing amounts of management attention, resources, and support. What was primarily an informal program in the 1970's and 1980's has progressed into a more formal occupational safety and health management program under the direction of a full-time

and lost days severity before nonsubscription were 4.2, 2.6, and 99.0 respectively. The mean frequency, severity, and lost day's severity after nonsubscription were 14.8, 2.4, and 48.9 respectively and the standard deviations for the same variables and time period were 2.5, 1.7, and 48.9.

Were the safety enhancements that occurred at Atco after their transition from the traditional workers' compensation system to self insurance just an anomaly or could this be a definable pattern among other nonsubscribers in Texas? This is a complex question with many variables to identify and control. Positive results would indicate the need for a closer look at the responsible nonsubscriber way of doing business as a viable alternative for a broken workers' compensation system on a national level.

METHODS

Research Design

The objective of this project was to evaluate nonsubscriber safety programs as compared to TWCC guidelines and to analyze the effect of nonsubscription on management attention to safety, total losses, injury frequency rates, and injury severity rates. As a starting point for further evaluation of this question of workplace safety programs a group of Texas nonsubscribers was nonrandomly selected and surveyed with the goal being to analyze their occupational health and safety programs qualitatively and to evaluate management perceptions regarding the effect of self insurance on injury frequency, severity, claims, and management attention to safety. The comparison target is the Texas Workers' Compensation Commission guidelines for model safety programs. The TWCC safety program guidelines represent widely accepted views by both industry and government. The TWCC guidelines listed in Table C1 have a basic formal framework that includes management commitment, written documentation of the plan, monitoring of work performance, integration of safety into management planning activities, contractor safety, review of production changes, inspections, employee input, accident investigation, employee training, medical treatment, professional coordination of the program, written safety rules, emergency planning, facility maintenance, use of employee safety committees,

formal program evaluations, and record keeping (Occupational Safety and Health Division, 1997). The TWCC guidelines are mirrored by Federal OSHA safety program guidelines for small business and for Voluntary Protection Plan, also known as the VPP certification. The OSHA small business guidelines include recommendations for a four-point program which includes management commitment and employee involvement, worksite analysis, hazard prevention and control, and training for employees, supervisors, and managers (U.S. Department of Labor, 1990). OSHA VPP certification requirements include the listing from Table C1 and very strongly resemble the TWCC guidelines for safety programs. Private industry opinion on safety programs can be seen also to parallel the TWCC guidelines. The National Safety Council's Safety Priorities Survey in 1992 showed that the very best occupational safety programs included the items listed in Table C1 as most important to success. The National Safety Council survey results again parallel the TWCC guidelines (Fearn & Planek ,1993, p. 18). Proposed International Standards Organization (ISO) occupational safety and health management standard includes the basic items in the TWCC guidelines as their framework- see Table C1 (Dyjack & Levine, 1997 ,p. 293). The impact of implementing a safety program which includes the items of top management commitment, written program, professional management, safety committees, hazard elimination, and incentives is seen in the study results of Missouri Workers' Safety Program of the Missouri Division of Workers Compensation. The 1993 study showed that companies which were certified to having met the state's safety program guidelines showed a 50% decrease in total number of injuries and illness

1989,p. 245). The frequency and severity rates are often divided by a standard number of work hours such as 200,000 or 1,000,000 to allow for comparison between various industries and employers. Total dollar costs of injuries and illnesses are often calculated in terms of medical and indemnity losses (Grimaldi & Simonds, 1989, p. 246). Even though these losses are sometimes insured they are still a good indicator of the level of safety performance due to their impact on management's attention to the bottom line. The null hypothesis includes the assumption that decreasing injury frequency rates, decreasing severity rates, and decreasing total losses after becoming a nonsubscriber do not significantly support the perception that nonsubscription increased management's attention to workplace safety. If the survey respondents have low safety program intensity scores and report no change or increases in accident rates the opinion that nonsubscribers have increased levels of management attention to safety would have failed this statistical analysis. In other words, the perception would have to be explained by something other than safety program intensity and accident rates.

Multi variate analysis will be used in the treatment of the data to determine if the variables of injury rates, severity rates, safety program intensity score, and total losses have a significant relationship with the respondent's perception of management attention to workplace safety. Logistic regression analysis of the dependant response and its relation to the independent variables will be performed using SPSS software (Norusis, 1993, p. 1).

Specific Procedures

Surveys were distributed to management representatives of select Texas nonsubscriber employers. Due to the lack of financial resources and to the difficulty in identifying and reaching the target population random methods of selecting participants were not utilized in this study. An exemption was granted from University of North Texas Health Science Center in Fort Worth Institutional Review Board for the Protection of Human Subjects. Two hundred seventy-seven surveys were attempted by direct contact of nonsubscribers primarily in the Dallas/Ft. Worth metroplex selected from the state listing of nonsubscribers. Methods used to conduct the surveys included mailing, faxing, phoning, and direct interviewing. The state listing includes more than 80,000 firms who registered with the state by sending in the Texas Workers' Compensation Commission Form 5 which is a mandatory requirement of the state's workers' compensation law. The registration of nonsubscribers began in 1990 and it still a requirement if a firm elects to opt out of the workers' compensation system. The survey population of nonsubscribers tended to over represent manufacturing firms and organizations with greater than 50 employees. This was done intentionally with the assumption that the effect on safety would be more pronounced or observable in organizations where hazards are more apparent as is the case in manufacturing environments and organizations with a large base of employees. The manufacturing sector had both the highest injury frequency rate and severity rate in 1994 as compared to other

sectors such as retail, transportation, mining, and services (Texas Workers Compensation Commission, 1996, p. 3-5). Since the nonsubscriber listing from the state shows organizations who opted out starting in 1990, only those organizations whose current address could be verified in the phone book were put on the attempted survey list. Additional surveys were distributed at TXANS chapter meetings in Dallas, Fort Worth, and Houston. The TXANS organization agreed to insert the survey in its Fall 1997 newsletter. The newsletter insert went to all 1200 members of the TXANS association of responsible nonsubscribers. Follow up on surveys was conducted by phone and fax in order to encourage a higher response rate. A total of 1477 surveys were attempted in this study including the TXANS newsletter enclosure.

Research Population

TXANS membership includes companies representative of all major aspects of the economy except government. Companies were selected from the state's nonsubscriber listing based on size and type of business activity. Organizations in the transportation, manufacturing, retail, and services were of a primary focus in this study although the survey population was not necessarily representative of each major sector's presence in the economy. The 1200 members of TXANS employ more than 300,000 workers. Generally smaller employers with primarily office bound staff were avoided in this study. Although model safety programs have value for all employers and could be implemented in any workplace regardless of size small office bound employers generally have much less risk and therefore much less motivation to implement employee safety programs.

Survey Instrument

As displayed in Appendix D the survey instrument consists of 25 closed end multiple choice questions, one yes/no question, and two open- ended questions regarding employment size and type of business. The questionnaire takes approximately 5 to 10 minutes to complete if the management representative is familiar with the company's safety program. If the representative is not familiar with the safety program and loss experience, more time may be needed for completion of the survey.

Question responses 1 to 20 are used to rate the overall elements of the safety program against Texas Workers' Compensation Commission recommendations. Three answer choices are available to the respondent for each program element covered. The three answer choices will rate the particular program element as nonexistent, present but in an informal fashion, or formally present and evidenced by written documentation.

Question 21 asks the respondent to check one of four ranges for 1996 total worker compensation costs. The total workers' compensation costs include all medical and indemnity payments. Questions 22 to 25 ask the respondent to rate the effect of nonsubscription on management attention to safety, injury costs, injury frequency, and injury severity. Question 26 asks for the year that the organization became a nonsubscriber. Question 27 asks for the respondent to classify their employer's status as to whether they are a "responsible" nonsubscriber or not. Questions 28 and 29 ask for company size in terms of location, total employment, and business type respectively. Appendix D contains the survey instrument and the cover letter which were

used in this study.

Data Scoring

The management representative will have to compare the injury frequency rate, injury severity rate, total direct dollar losses, and management attention to safety in the years before the firm became a nonsubscriber to the years after becoming a nonsubscriber. Questions 1-20 each contain three multiple choice answers. Each of the three answers reflects how formal the management element is in the organization. The answer that reflects the management element to be present in a formal way receives two points. The element that reflects the management element being present in an informal way receives one point and if the respondent rates the element not to be present in the safety program that answer receives zero points. Total points received for questions 1-20 reflect the intensity of the safety management program. A score of 40 points would indicate a well developed, model safety management system. A score between 20 and 40 points would indicate a program that is both somewhat formal and informal or perhaps a developing program. A score below 20 points would indicate a poor safety management system or one that is nonexistent. For questions 22-25 the respondent circles the answer which best describes what has happened to injury frequency rates, severity rates, total dollar losses, and management attention to safety since the organization became a nonsubscriber. The answer choices for questions 22-25 includes increasing, decreasing, no difference, or unknown (for question 25 only). Leaving "unknown" off of questions 22-24 was done to encourage the firm to research its injury and loss rates to see what the trend has been since

the firm became a nonsubscriber. The answers to questions 22-24 were rated as follows: increasing was assigned the number zero, decreasing was assigned the number one, no difference was given the number two, and unknown was assigned the number three. The answer to question 25 was assigned the number zero for the increasing response and the number one for all other responses listed. Question 21 asked the respondent to check the range of values which best fit the firm's previous year (1996) injury total costs. Zero to $50,000 was assigned the number one. Fifty thousand dollars to $100,000 was given number two. One hundred thousand to $500,000 was given the number three and losses of $500,000 or greater were given the number four. Question 26 asks whether or not the organization is a responsible nonsubscriber. Questions 28-30 asks for information concerning the number of employees and the type of business engaged in by the organization.

RESULTS

Survey Response

As of 10/3/97 seventy-two surveys had been completed giving an overall response rate of five percent. Surveying began on 8/5/97. Table E1 shows the coded data obtained from the completed surveys. Total number of persons reported to be employed by the surveyed organizations was 77,486.

Treatment of Data

SPSS Windows-based software was used in the data analysis. As shown in table E1 the survey responses were coded to facilitate the use of logistic regression. In logistic regression the probability of a binary event occurring is directly estimated from a set of independent variables (Norusis, 1993, p. 1). In this case the binary dependant variable is defined from the survey responses as either "yes=0" or "no=1" for question number 25 in regards to the status of management attention to safety and whether attention "increased" after the organization became a nonsubscriber. The independent variables that were tested for significance in influencing and predicting the dependent response included the safety program intensity score which is the total score on questions 1-20, total annual losses, total annual OSHA frequency rate, and total annual OSHA severity rate. Forward stepwise selection was used to input each independent variable into the probability equation. The likelihood-ratio test was selected for determining the variables to be

removed from the model. Forward stepwise selection for logistic regression yields the model which best fits the prediction of the dependent variable.

Analysis of research questions

Figure F1 compares the mean safety intensity scores by industry classification. The safety intensity score was derived by adding the coded responses to questions number 1 to 20. A safety intensity score above 30 points would indicate a well developed, model safety program which closely resembles the TWCC criteria. A safety intensity score of 20 to 30 points would indicate a developing or informal safety program. A safety intensity score below 20 points would indicate a very informal or nonexistent safety program. SPSS software was used to perform the logistic regression function with management attention to safety serving as the dependent variable and reported losses, frequency rate, severity rate, and safety intensity score serving as the independent variables. SPSS software was also used to perform a correlation analysis between organizational size in numbers of employees and the safety intensity score.

Results

Use of forward step-wise logistic regression with an alpha level of $p=0.05$ found the independent variable of safety program intensity score, Wald (1)=10.1992, $p=.0014$ to be a significant predictor of increased management attention to safety. The model developed from the frequency rate and the safety program intensity score variables were found to have a highly significant impact on explaining the dependent variable response of increased management attention to safety, Chi-Square (3)=24.653, $p=.0001$. Logistic

regression was used with just the dependent response and each independent variable alone in the model. Using this method the independent variables of decreasing loss rates and decreasing severity rates (Wald (1)=7.3747, p=.0066 and Wald (1)=6.3332, p=.0119, respectively) were both found to be significant predictors of increased management attention to safety when they were entered into the logistic regression equation individually with no other independent variables present. Decreased frequency rate was found to not be a significant predictor of increased management attention to safety even when entered into the logistic regression model without any other independent variables present.

Organizational size in terms of total employees was found to be significantly correlated with the safety intensity score, Spearman correlation, r=.604, p=.01. As depicted by Figure F1 nondurable manufacturing companies and transportation firms were both found to have the highest mean safety intensity score ($\bar{x}$=33, n=6, SD=4.8) with construction firms showing the lowest mean score ($\bar{x}$=27, n=3, SD=6.1). Figure F2 compares the mean safety intensity scores by size of organization in terms of number of employees. Those organizations with 500 or more employees had the highest mean safety intensity ($\bar{x}$=35, n=18, SD=3.6) while those with zero to ten employees had the lowest mean safety intensity score ($\bar{x}$=16, n=5, SD=6.7). This gives evidence that larger organizations may be better equipped to implement comprehensive safety management programs than the smaller employer. Figure F3 shows the breakdown by industry classification of those organizations who participated in the study. Durable goods

manufacturers accounted for 40.3% of the respondents while transportation and construction were somewhat under represented at 2.8% and 4.2% respectively. Service industries accounted for the second largest group of respondents with 27.8% representation. Figure F4 shows the breakdown by employment size of those organizations who responded to the survey. The largest segment at 31.9% was the employer with 11 to 50 total employees. Large employers with 501 or more employees were represented by 25% of the respondents. The smallest category of employment size was the zero to ten employees which was represented by 6.9% of all respondents. Figure F5 shows that 80.6% of all organizations participating in this study reported that management attention to workplace safety had increased after the company became a nonsubscriber to workers' compensation. The overall population results (N=72) found a mean safety program intensity score ($\bar{x}$=30, SD=8.9) that indicated safety programs that scored in the formal and well-developed sector (30 to 40 points). The mean number of employees was calculated to be $\bar{x}$=1076 (N=72, SD=2843.2).

DISCUSSION

Limitations of Study

The purpose of this project was to survey select Texas nonsubscribers in order to evaluate nonsubscriber safety programs as compared to TWCC guidelines and to analyze the effect of nonsubscription on management attention to safety, total losses, injury frequency rates, and injury severity rates. Historically nonsubscribers have been a difficult group to study unless you come under the umbrella of an official state or federally sponsored study. The target group of this study is Texas responsible nonsubscribers only. Those who "go bare" and do not offer alternative workers compensation benefits to injured workers are of no particular concern of this study. In order to effectively reach this group discussions had to take place with the largest and only trade association which represents responsible nonsubscribers (TXANS). The TXANS leadership was interested in this study, as they often are seeking ways to enhance their political situation in order to ensure a future which allows for the continued legal rejection of the Texas workers compensation act. TXANS is made up of 1,200 member companies. The TXANS membership directory was requested for this study but was not available since it is a confidential database. Nonsubscribers in Texas are required to register with the state and this database was purchased for the purposes of identifying more survey respondents. Limiting factors involved with using the state listing included the lack of a contact person,

telephone or fax number, and the sometimes outdated information found in the database such as address and company name. As the surveying progressed it become obvious that potential respondents were concerned about the legalities of completing the surveys which in essence gave a written evaluation of their workplace health and safety activities. Despite assurances of anonymity and extensive attempts at avoiding the use of company identifying information on the surveys some companies were reluctant to complete the survey for fear of creating evidence that could be used against them in a liability lawsuit and/or OSHA intervention.

Unanticipated Results

Use of forward step-wise logistic regression found the independent variables of decreased frequency rate, decreased severity rate, and decreased total losses to not be significant predictors of the dependent response of increased management attention to safety with an alpha level of p=0.05, Wald (1)=.0073,p=.9321, Wald (1)=.0090, p=.9245, and Wald (1)=.3454, p=.5567 respectively. Using various methods of logistic regression such as simultaneous entry of all independent variables, entry of variables by forward step-wise regression, and entry of variables by back word regression did not produce a model with all independent variables contributing a significant effect on predicting the dependent response. Individual entry of the independent variables of decreased loss rates and decreased severity rates found these variables to be significant predictors of increased management attention to workplace safety.

Conclusions

The purpose of this project was to survey select Texas nonsubscribers in order to evaluate nonsubscriber safety programs as compared to TWCC guidelines and to analyze the effect of nonsubscription on management attention to safety, total losses, injury frequency rates, and injury severity rates. The research findings indicate that for the population of nonsubcribers sampled a significant relationship exists between reports that management attention to workplace safety had increased after the organization became a nonsubscriber and the response variable of safety program intensity score. In other words the response by nonsubscribers that management attention to workplace safety had increased was supported by responses that indicate self reported safety program intensity scores that were significantly higher than companies that reported no change in management attention to safety. The responses regarding reports of decreased frequency rate, decreased severity rate, and decreased total loss rates after the organization became a nonsubscriber did not have a significant impact on explaining the nonsubscriber responses that management attention to workplace safety had increased when entered into the logistic regression model. Decreased loss rates and decreased injury severity rates when entered individually into the regression model were found to be significant predictors of increased management attention to safety. In other words, when all independent variables were analyzed together only the safety program intensity score was found to be a significant predictor of the dependent response. When the independent variables are entered into the logistic regression model individually the variables of decreased losses and

decreased injury severity rates become significant predictors of the dependent response. A majority of the organizations surveyed stated that management attention to workplace safety had increased after the company became a nonsubscriber to traditional workers' compensation insurance.

Implications

The results from the nonsubscriber population sampled in this study indicate that there is supporting evidence in the form of well developed, model safety programs for those firms that reported management attention to workplace safety had increased after the organization had become a nonsubscriber. This gives evidence that nonsubscription to traditional workers' compensation insurance may serve as an impetus for better employee safety programs with decreased losses and decreased injury severity rates verifying this success. The lack of a significant relationship between management attention to safety and injury frequency rates may indicate that improved safety management programs may not cause reductions in accident rates or more time and accident experience is needed for adequate subscription versus nonsubscription comparisons to be made.

Recommendations

Prevention of workplace accidents and illness in the workplace is a key element in seeking to reduce human suffering and achieve lower workers' compensation insurance costs (National Conference of State Legislatures, 1994, p. 21). Many nonsubscribers in Texas have realized improvements in workplace safety since becoming nonsubscribers. Joint efforts by government, employers, and employees can enhance workplace safety and

health. The traditional workers' compensation system was designed to provide incentives for employers to invest in workplace safety and health. Various states have attempted to use worker compensation systems to encourage more proactive stances to prevent job injury, illness, and death. Some of these efforts include mandatory safety and health committees, written safety programs, special deductible plans, education, and research (National Conference of State Legislatures, 1994, p. 21). Only Texas allows employers to reject the traditional state run workers' compensation system. If improvement in workplace safety is a goal, as most experts would identify it as, the effect of self insurance on improving safety deserves further attention and research as a viable alternative to the traditional workers' compensation system. The original framers of state workers' compensation programs argued that the sacrifice of common law rights to sue employers for negligence in exchange for a guarantee of compensation would serve to improve workers' well being. Allowing employees to sue their employers for negligence while still receiving workers' compensation benefits would increase an employer's expected cost from an injury and would encourage greater safety efforts. This type of system would represent a hybrid model involving aspects of both the nonsubscriber methods and the traditional workers' compensation systems. Negligence suits could also encourage greater workplace safety by expanding compliance with OSHA's safety and health standards since courts often interpret OSHA violations has evidence of negligence (Kniesner & Leeth ,1991, p. 69).

Evidence indicates that OSHA has had very little impact on safety during the 1970's and at best a marginal impact of severity reduction of 2 to 5 percent in the 1980's (Kniesner & Leeth ,1991, p. 70). OSHA lacks the resources to adequately enforce and drive home the value of safety to workplace management but the Texas workers' compensation nonsubscribers view safety as a necessity in order to avoid negligence per se lawsuits. Negligence per se is the legal definition meaning that negligence occurred because a recognized standard (i.e. OSHA) was violated. Negligence per se is the driving force behind the nonsubscriber's compliance with OSHA standards. This concept would seem to hold promise as a motivator for workplace safety but a paradigm shift would have to occur in all state run workers' compensation systems. The paradigm shift would involve a changeover to a negligence-based system while at the same time mandating employer managed benefit systems. In a negligence-based system employers must answer questions regarding whether or not diligence was used in providing employee training, chemical hazard communication, workplace inspection and hazard control, and provisioning of proper tools and machine guards. State legislators need to realize that attempts to address workers' compensation injuries are incomplete if the prevention of workplace injuries and illnesses is not considered. Workplace injuries and illnesses are the factors giving rise to workers' compensation costs. By preventing workplace death and disease we would avoid more than just human suffering but also we would escape never ending political debates regarding the distribution of costs, adequacy of compensation, and the tensions between employees who file claims and their employers. The superior value

of prevention- over compensation- is obvious (Spieler, 1994, p. 127). Focusing cost reduction efforts on medical and indemnity benefits after an injury occurs overlooks significant opportunities to control costs and actually ignores the social responsibility of the workers' compensation system to promote a safe and healthful workplace (National Conference of State Legislatures, 1994, p. 21). Safety professionals have studied the question of how to effectively improve management attention to workplace safety for many years. The focus is often on increasing standards and regulations. This approach has fallen short in reducing work related injuries and illness. Management attention to workplace safety can be increased and improved without government intervention as demonstrated by the responsible nonsubscribers in Texas.

The 75th State of Texas Legislature adjourned June 2, 1997 without workers' compensation becoming mandatory. State's looking to bring runaway workers' compensation costs under control should give safety and return-to-work programs the highest priority. The Pioneer Research Institute advocates that states should promote the formation of self-insurance groups with rigorous safety standards needed for admittance. Employers who self insure pay all of their own costs associated with mandated workers' compensation benefits like Texas nonsubscribers are apt to do. Self insurance results in the purest form of experience rating with the self insured employers' costs tied directly to their incurred losses. Government organized self insurance plans are available in some states but the rigorous admittance requirements deter most employers. Yet those who have opted to self insure are most often credited with aggressive safety and claims

reducing programs (Spieler, 1994, p. 189). Texas has attempted to deregulate workers' compensation premiums by allowing for lower premium schedules for employers they believe to be good risks. Rate deregulation reinforces the statutory emphasis on worker safety (Pioneer Institute for Public Policy, 1995, p. 3). Oregon workers' compensation reform requires employers with 10 or more employees to set up worker-management safety committees (Pioneer Institute for Public Policy, 1995, p. 4). An occupational safety and health division was added to the Texas Workers' Compensation Commission during its reform in 1989 with a recognition that prevention is the key to cost control. The new system in Texas seems to have controlled costs, brought a reduction in worker compensation insurance premiums, and reduced workplace injuries rates (Texas Sunset Advisory Commission, 1994).

On a typical day 154 U.S. workers die of work related disease or injury with 9,000 disabled. In 1993 the National Safety Council estimated that for injuries alone, medical costs and losses of productivity and wages totaled $112 billion. This toll is preventable, but not without investing in the research needed to identify the causes and to develop adequate controls (National Institute of Occupational Safety and Health). Responsible nonsubscription deserves more research as a possible method of increasing management attention to workplace safety and therefore creating substantial savings when injuries and illnesses decline.

APPENDIX A

DIAGRAMS OF NONSUBSCRIBER VERSUS SUBSCRIBER

Figure A2

Diagram of Nonsubscriber Injury Management

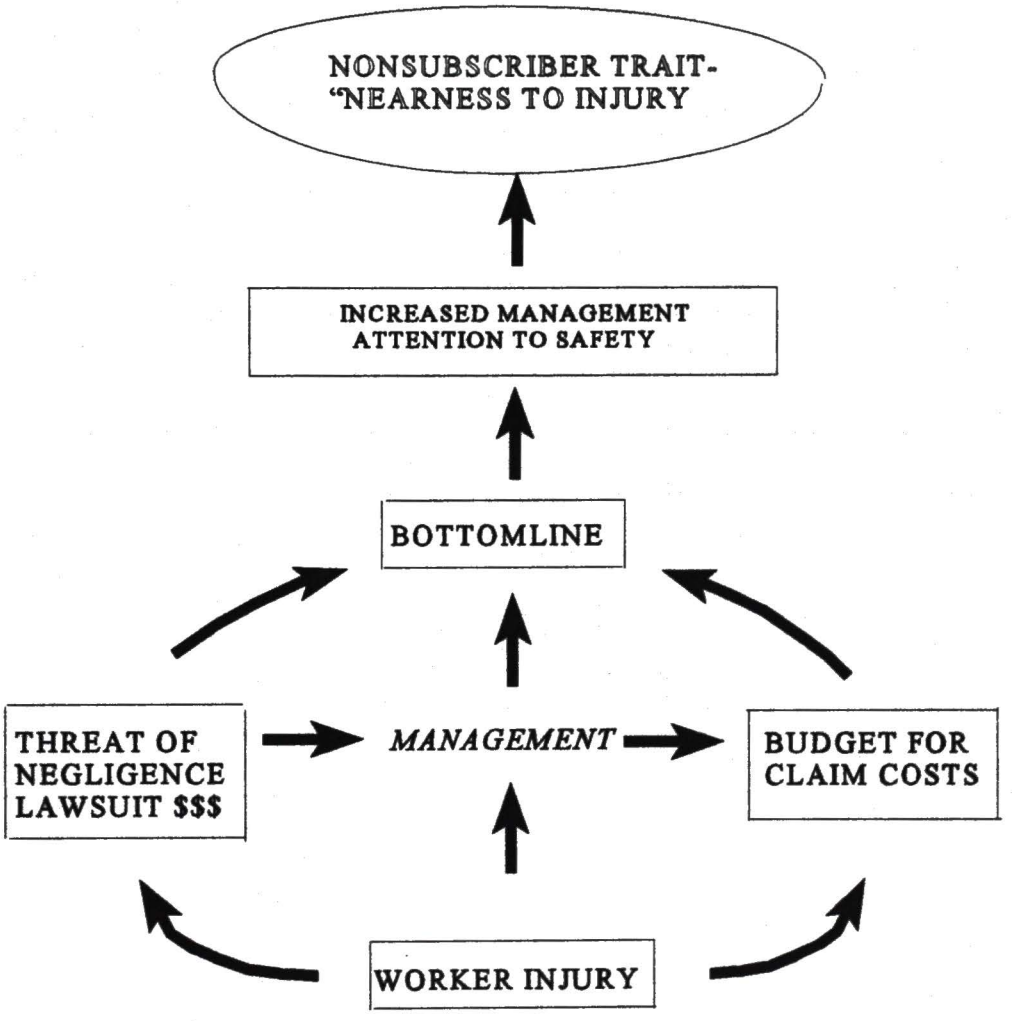


Table B1

Atco Data- Before and After Self-Insuring

Year	Frequency[b] Rate	Severity Rate[c] (Cases)	Severity Rate[d] (Lost Days)	Total Claim[e] Costs
1983	17.0	14.04	232.08	Not Available
1984	27.45	10.56	153.45	Not Available
1985	24.80	14.75	384.80	Not Available
1986	19.15	14.05	171.11	$58,094
1987	17.63	9.12	120.40	$106,691
1988	17.37	8.69	182.42	$118,599
1989	23.06	9.60	336.32	$297,068
1990	17.42	1.49	113.0	$31,914
1991	16.17	3.00	91.02	$228,180
1992	14.52	1.18	21.19	$17,071
1993	10.16	2.22	112.13	$125,086
1994	15.57	5.60	117.70	$85,298
1995	13.26	2.65	22.70	$26,924
1996	16.43	.54	11.85	$56,422

[b] (Number of OSHA recordable cases) x (hours worked)/ 200,000 hours.

[c] (Number of lost day cases) x (hours worked)/ 200,000 hours.

[d] (Number of lost work days) x (hours worked)/200,000 hours.

[e] Total dollar losses from medical expenses and indemnity payments.

APPENDIX C

MODEL SAFETY PROGRAM CRITERIA COMPARISON

Table C1

Model Safety Program Criteria Comparison

TWCC Peer[a]	OSHA 4 Point[b]	OSHA VPP[c]	NSC Priorities[d]	Proposed ISO[e]
Management Commitment	Management Commitment	Low Accident Rates	Management Policy	Safety Policy
Written Plan	Worksite Analysis	Management Leadership	New Hire Training	Responsibility and Authority
Monitoring Work Performance	Hazard Prevention and Control	Employee Involvement	Supervisors Setting Example	Management Representative
Management Planning	Employee Training	Worksite Analysis	Monitoring Employee Performance	Resources
Contractor Safety		Hazard Prevention	Senior Management Setting Example	Safety Planning
Change Control		Employee Training	Rule Enforcement	Performance Goal
Inspections		Concurrent Support from Unions	Middle Management Setting Example	Continuous Improvement
Employee Input			Compliance	Design Control

[a] Occupational Safety and Health Division. (1997). Peer Review Safety Program Requirements. Austin: Texas Workers' Compensation Commission.

[b] U.S. Department of Labor. (1990). OSHA Handbook for Small Business.

[c] Occupational Safety and Health Administration, U.S. Department of Labor. OSHA Self-Assessment Check List. Available : http://www.osha.gov/oshprogs/vpp/original/self.html #SCOREBOX

[d] Fearn, K.T., & Planek, T.W. (1993, October). Reevaluating Occupational Safety Priorities 1967 to 1992. Professional Safety, 38, 16-21.

[e] Management System for an ISO 9000-Compatible Occupational Health and Safety Standard. AIHA Journal, 58, 291-298.

Accident Investigation			Integration into Production	Record keeping
Employee Training			Employee Compliance	Safety Training
Medical Treatment			Professional Coordination	Inspection
Professional Coordination of Program			Employee Training	Control of Nonconforming Process
Written Safety Rules			Advisory Role of Safety Manager	
Emergency Planning			Supervisory Training	
Facility Maintenance				
Safety Committees				
Program Evaluations				
Record keeping				

APPENDIX D

SURVEY INSTRUMENT AND COVER LETTER

NONSUBSCRIBER WORKPLACE SAFETY SURVEY

Research Conducted By: Matt Smitha, CSP

Safety Coordinator, Atco Rubber Products, Inc. (TXANS Member)

and Graduate Student, Public Health Program

University of North Texas Health Science Center at Fort Worth

Dear Fellow Nonsubscriber,

I NEED YOUR HELP!!!

A survey is being conducted of select Texas nonsubscribers in order to evaluate management perception of the effect of nonsubscription on employee safety programs. The survey is **anonymous** in that no company identifying information is required, only your honest appraisal of your workplace safety program and how being a nonsubscriber to traditional workers' compensation has affected injury rates. The results will contain valuable "bench marking" information concerning nonsubscriber safety programs and will be made available to you at no cost.

Please take a few minutes to complete the attached survey and return to me in the enclosed preaddressed envelope.

If you would like to receive a summary of the results please enclose your name, fax number and/or address.

THANK YOU FOR YOUR TIME AND ASSISTANCE WITH THIS PROJECT!!!

TEXAS NONSUBSCRIBER SAFETY PROGRAM SURVEY

PLEASE CHECK THE ITEM LISTED AFTER EACH STATEMENT WHICH BEST DESCRIBES YOUR SAFETY PROGRAM:

1. Your **safety program** has:
_____A formal, written safety and health management plan
_____ No written documentation of plan
_____Some written programs ,but is mostly informal

2. Organizational **responsibility** and **authority** for safety:
_____Verbally or informally assigned
_____Assigned and delegated in writing
_____Has not been addressed in this organization

3. Safe work **performance:**
_____Safety is a part of certain employee's performance review (i.e. supervisors only)
_____Safety is not a part of the employee's performance review
_____Safety is a part of all employee's performance review

4. **Upper management support** for employee safety is evidenced by availability of adequate resources (i.e. equipment, staff, budget)?
_____No
_____Sometimes
_____Yes

5. **Safety and health practices** are:
_____ Integrated into overall company management and planning activities
_____Not a part of management planning
_____Are sometimes a part of management planning if hazards are apparent

6. A **contractor** safety program:
_____Exists but is an informal program
_____Does not exist
_____Formal, written program followed

7. Review of facility, operational and/or **production changes** to identify and control safety/health hazards:
_____Projects are not reviewed during prestart-up stages
_____Projects are adequately reviewed during prestart-up stages
_____Projects are sometimes reviewed during prestart-up stages

8. Facility **inspections**:
_____Are done on a periodic basis with appropriate documentation and follow-up
_____Are not a part of the safety program
_____Are occasionally completed but not on a regular basis

9. Soliciting **employee input and suggestions** concerning workplace safety and health issues:

_____Suggestions not sought
_____A method is in place to ensure employee safety suggestions are received and reviewed
_____Suggestions sometimes are asked for if needed

10. Describe your **accident investigation** and follow-up program:

_____Only serious accidents are investigated
_____No investigations are done
_____A formal accident investigation program is utilized with appropriate follow-up

11. Describe your **supervisor training program:**

_____No training in safety and first aid/CPR
_____Supervisors are trained in first aid/ CPR and receive periodic safety training
_____Some training provided but not on a regular basis

12. Describe **Medical treatment** of work related injuries:

____Occupational health services utilized
____No special arrangements are made, just as needed
____Family clinic or an immediate care center used

13. Describe the management and coordination of your **safety program**:

_____An outside safety professional is utilized (i.e. consultant)
_____Program is not under the direction of a professional
_____Safety is coordinated by an in-house (staff) professional

14. Safety rules:

_____Do not exist
_____Written rules exist which include requirements for the use of personal protective equipment
_____ Some rules exist, but not all requirements are documented

15. Describe your **emergency response** program:

_____Written plan is in place with periodic updating and drills
_____No formal plan is in effect
_____An informal plan is in effect (no documentation and/or no periodic drills)

16. Describe your equipment and facility **maintenance** program:

_____As needed basis only
_____A formal preventative program is in place
_____No formal program, some preventative work done

17. Describe your **safety orientation** and employee safety **training** program:

_____Formal safety training program for all new hires and regular employees
_____No program in place
_____Training done, but on an informal or strictly on the job basis

18. Employee **safety committees:**
____ Used but on an occasional or as needed basis
____ Not used
____ Are regularly utilized
19. Formal safety **program evaluations** and performance audits:
____Are not conducted
____Are conducted on a regular and periodic basis
____Are conducted but on an infrequent or irregular schedule
20. **Record keeping**:
_____Documentation is kept on file of all important safety and health related programs, medical and training records, and activities
_____No safety /health records or program documentation is kept
_____Some documentation of records occurs but is not inclusive of all safety program activities
21. 1996 total medical and indemnity losses: __ **less than $50,000** __**$50,000 to $100,000**
(From work related injuries/illness) ____**$100,000 to $500,000** ____**$500,000 or up**

Questions 22-25: Since becoming a nonsubscriber would you say: (circle the most appropriate answer)
22. *Total annual injury costs for medical and indemnity have*: **increased decreased no diff.**
23. *Annual injury frequency rate (# of OSHA recordable cases) has*: **increased decrease no diff.**
24. *Annual injury severity rate (# of lost work day cases) has:* **increased decreased no diff.**
25. *Management attention to workplace safety has*: **increased decreased no diff. unknown**
26. Year your company became a nonsubscriber: _____
27. Would you classify your employer as a responsible nonsubscriber (i.e. one who provides injury benefits)? _____**YES** _____**NO**
28. Company size (of location surveyed): _____ = # *of employees,*
Overall company size=_____
29. *Circle type of business:* **Services Construction Manufacturing**
Transportation Retail Other:_____
If manufacturing please circle one: **Durable Goods Nondurable Goods**

APPENDIX E

TABLE OF SURVEY DATA

Table E1

Table of Survey Data

Survey #	1-20 [a]	#21[b]	#22[c]	#23	#24	#25[d]	#26[e]	#27[f]	#28[g]	#29[h]	#30[i]
1	30	2	1	1	1	0		y	2500	R	
2	34	1	1	1	1	0		y	100	C	
3	31	1	3	3	3	0		y	700	R	
4	37	3	1	1	1	0	90	y	500	M	D

[a] Answers to questions 1-20 receive two points for the formal response, one point for informal, and zero points for the nonexistent response. Maximum score possible is 40 points.

[b] Question 21 possible answers are assigned the number 1 to indicate losses in the zero to $50k range, assigned the number 2 to indicate losses in the $50k to $100k range, the number 3 to indicate losses in the $100k to $500k range, and the number 4 to indicate losses greater than $500k

[c] Answers to questions 22 to 24 were given the number zero to indicate the increasing answer, the number 1 to indicate the decreasing response, the number 2 to indicate the no difference response, and the number 3 to indicate the unknown response.

[d] Answers to question 25 were given the number zero to indicate increased management attention to safety and the number one for all other responses.

[e] Indicates year respondent indicated the organization became a nonsubscriber.

[f] "Y" indicates responsible nonsubscriber, "N" indicates nonsubscriber.

[g] Number of employees reported on the survey

[h] "R" indicates retail, "C" indicates construction, "S" indicates services, "M" indicates manufacturing.

[i] "N" indicates nondurable goods manufacturing, "D" indicates durable goods manufacturing

5	33	4	1	1	1	0	91	y	8000	R	
6	38	1	1	1	1	0	90	y	285	M	D
7	30	1	1	1	1	0	88	y	200	M	D
8	15	1	1	1	1	1	89	y	8	M	D
9	32	3	1	1	1	0	90		5000	R	
10	27	1	1	1	1	0	75	y		M	D
11	27	1	1	1	1	0	90	y	15	M	D
12	39	3	1	2	1	0	95	y	1838	S	
13	30	1	1	2	1	1	92	y	25	M	D
14	29	1	1	1	1	0	91		200	R	
15	29	1	1	1	1	0	94	y	20	M	D
16	37	1	1	1	1	0	95	y	350	S	
17	34	1	1	2	1	0	93	y	22	M	D
18	39	1	1	1	1	0	92	y	150	M	N
19	34	1	1	1	1	0	90	y	125	M	D
20	28	1	1	1	1	1	93	y	800	M	N
21	24	1	1	1	1	1	93	y	15	C	
22	29	1	1	2	2	0	91	y	75	S	
23	23	1	2	2	1	0	90	y	6	C	
24	27	1	2	2	2	1		y	30	M	D
25	39	1	2	2	2	0		y	150	S	
26	39	2	1	1	1	0	93	y	800	M	D
27	32	3	1	1	1	0	89	y	9000	S	
28	29	1	1	1	1	0	89	y	78	M	D
29	33	3	1	1	1	0	92	y	15k	R	

30	16	1	2	2	2	1	95	y	30	M	D
31	31	1	2	2	2	0	90	y	12	M	D
32	11	1	1	1	1	1	90	y	8	S	
33	40	2	1	1	1	0	94	y	175	M	D
34	23	1	1	1	1	0	90	y	16	M	D
35	34	1	1	1	1	0	93	y	40	M	D
36	36	1	1	2	2	1	90	y	35	M	D
37	3	1	3	3	3	1			25	S	
38	3	1	2	2	2	1		y	30	S	
39	40	1	3	3	3	1				S	
40	37	4	1	2	1	0	90	y	1500	T	
41	5	1	1	1	1	1	92	y	12	M	D
42	30	1	1	1	1	0	92	y	50	M	D
43	40	1	1	1	1	0	94	y	199	S	
44	35	1	1	1	1	0	92	y	140	S	
45	26	1	1	1	1	0	93	y	65	M	D
46	14	1	2	2	2	0	93	y	10	M	D
47	30	1	1	1	1	0	86	y	45	M	D
48	33	1	2	1	1	0	90	y	110	S	
49	19	1	2	2	1	1	94	y	19	S	
50	30	1	1	2	2	0	93	y	12	M	D
51	35	1	1	1	1	0	90	y	15	S	
52	34	1	2	1	1	0	90	Y	110	S	
53	37	1	1	1	1	0	90	Y	400	M	D
54	33	1	1	1	1	0	91	Y	700	M	D

55	19	1	2	2	2	0	78	Y	45	S	
56	29	1	1	1	1	0	90	Y	70	R	
57	39	3	1	0	1	0	90	Y	2124	S	
58	37	1	1	1	1	0	96	Y	1400	S	
59	40	1	1	1	1	0	91	Y	1200	R	
60	39	2	1	1	1	0	94	Y	750	M	D
61	36	2	1	1	1	0	92	Y	14K	R	
62	29	1	1	1	3	0	91	Y	42	T	
63	24	1	1	1	1	0	90	Y	20	S	
64	33	1	2	2	2	1			75	R	
65	11	1	1	1	1	0	91	Y	250	R	
66	35	1	1	1	1	0	93	Y	350	S	
67	22	1	1	1	1	0	91	Y	11	M	D
68	38	1	1	1	1	0	90	Y	100	M	N
69	35	1	1	1	1	0	91	Y	600	M	D
70	33	1	1	1	2	0	91	Y	30	M	N
71	38	1	1	1	1	0	91	Y	75	M	D
72	37	4	1	1	1	0	91	Y	6500	R	

APPENDIX F

ANALYSIS OF SURVEY DATA

Figure F1

Comparison of Mean Safety Intensity Scores by Industry

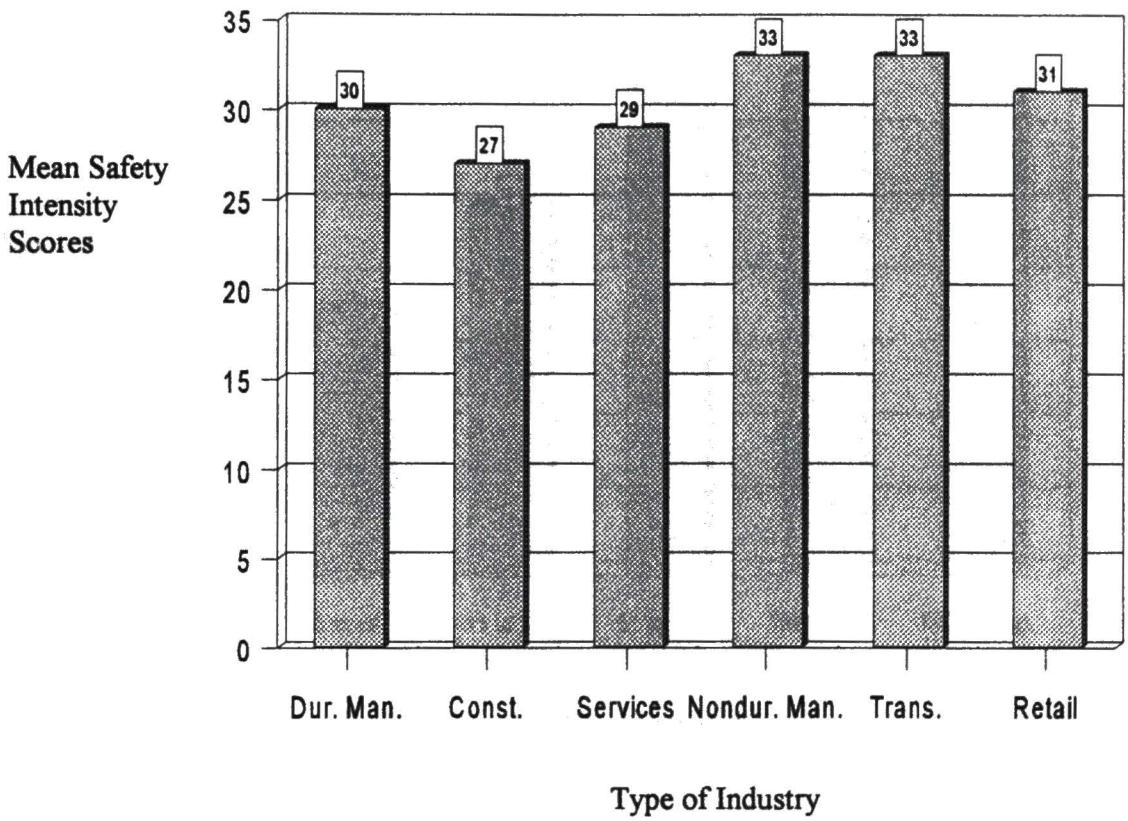


Figure F1. Mean safety intensity scores for Durable Goods Manufacturing (n=29, SD=8.6), Construction (n=3, SD=6.1), Services (n=20, SD=12.0), Nondurable Goods Manufacturing (n=6, SD=4.8), Transportation (n=2, SD=5.7), and Retail (n=12, SD=7.2).

Figure F2

Comparison of Mean Safety Intensity Scores by Size of Organization

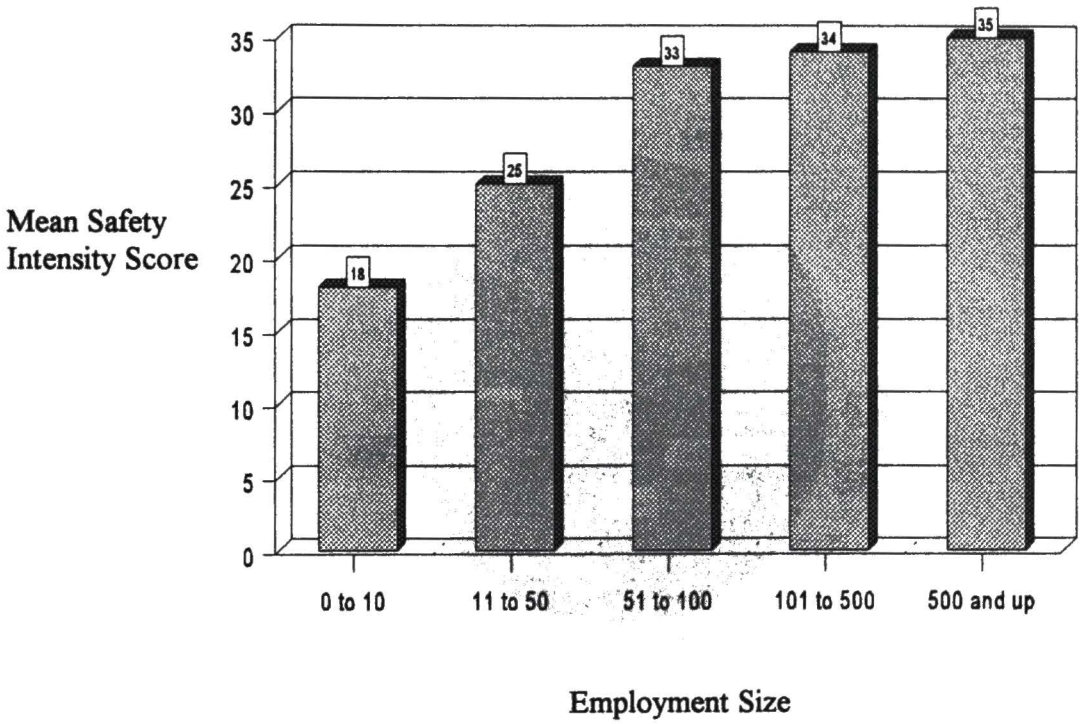


Figure F2. Mean safety intensity score by organizational size: 0 to 10 employees (n=5, SD=6.7), 11 to 50 (n=23, SD=9.9), 51 to 100 (n=11, SD=5.3), 101 to 500 (n=15, SD= 7.1), 501 and up (n=18, SD=3.6).

Figure F3

Make-up of Survey Population by Industry Classification

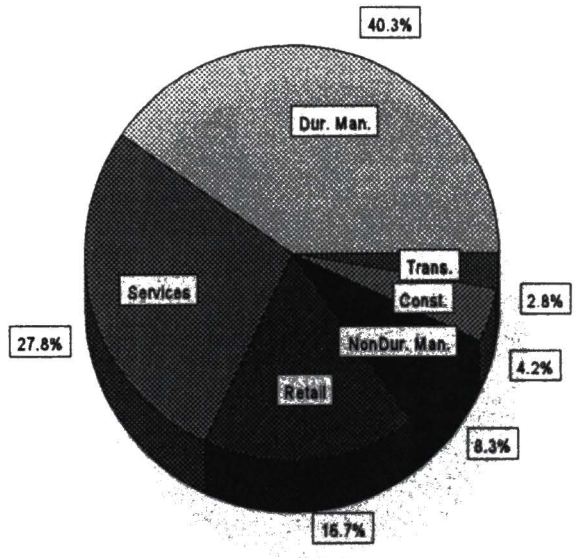


Figure F4

Make-up of Survey Population by Employment Size

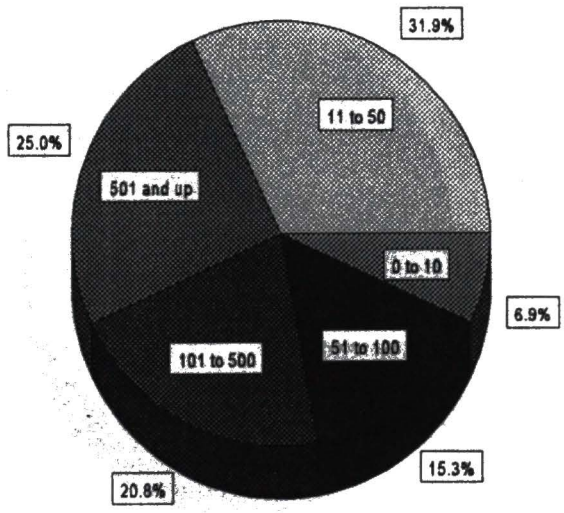
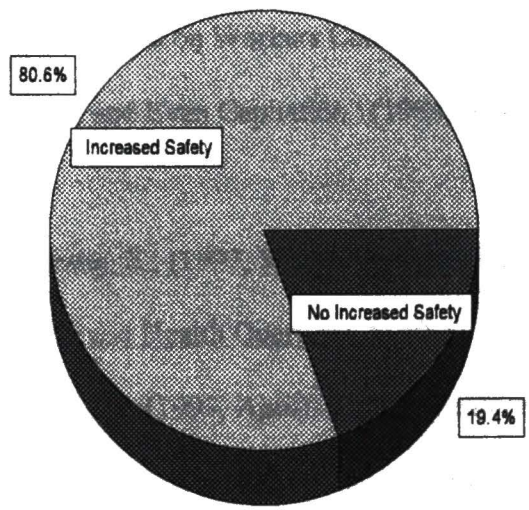


Figure F5

Percentage of Nonsubscribers Reporting Increased Management Attention to Safety



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