

1982

## Industrial safety and technologicalization: An analysis of the management of industrial safety programs in Saudi Arabia

Abdulla Rashad Jastaniah  
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INDUSTRIAL SAFETY AND TECHNOLOGICALIZATION: AN ANALYSIS  
OF THE MANAGEMENT OF INDUSTRIAL SAFETY PROGRAMS IN SAUDI  
ARABIA

*University of Northern Iowa*

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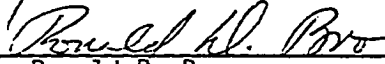


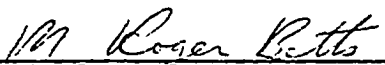
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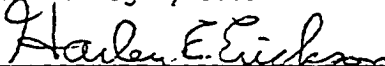
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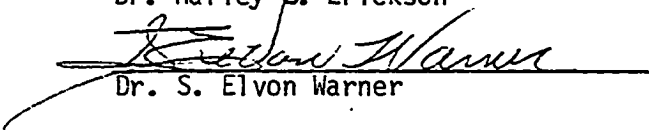
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## Dedication

To His Royal Highness Colonel  
Khalid Bin Sultan Bin Abdulaziz  
for without his support  
and encouragement  
this would have not been possible

الله

الذي صعدت الشجرة الملك  
العقيد الزكي  
خالد بن سلطان بن عبد العزيز  
الذي بروه شجيرة ومساندته لم يكن هذا ممكنا

## ACKNOWLEDGEMENTS

The completion of this dissertation would not have been possible primarily without Allah's will and the support, time, and help of many people. The writer wishes to extend his utmost gratitude to his major advisor, Dr. Michael R. White, for his unmatched support, encouragement, and advice for the successful completion of this study. The writer also wishes to thank his co-advisor, Dr. Ronald D. Bro for his guidance, advice and support in completing this project.

The writer extends his sincere appreciation and gratitude to his committee members, Dr. S. Elvon Warner, for his time, effort, and help during this study project, and Dr. M. Roger Betts, for his support and understanding. The writer is indebted to Dr. Harley E. Erickson, for his advice, help and the ample time spent in the statistical analysis of this study. His patience and wit was unmatched.

The writer also wishes to extend his thanks to his colleagues at the Saudi Air Defense Command for their help and assistance in translating, producing, and processing the returns of the data collection instruments. Also, the management of private industry and government officials who provided the data that made the completion of this study possible, deserve credit for their time and cooperation. The panel of experts who validated the data collection instruments also deserve the writer's appreciation for their time and effort to respond.

Finally, the writer reserves his gratitude for his parents and his wife, whose prayers, encouragements, emotional and moral support were unlimited. A special thank you to my two sons, Wa'il and Wasil, who were patient while they were deprived of my attention, obligations, and time during the last six years.

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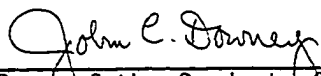
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An Abstract of a Dissertation  
Submitted  
In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Industrial Technology

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University of Northern Iowa  
December 1982

## ABSTRACT

The problem of this research was to determine the present industrial safety measures in selected Saudi Arabian industries, and to determine the status of government activity and involvement in industrial safety.

The procedural methods that were incorporated in this research were:

1. An intensive review of the literature was conducted concerning the management principles and theories of industrial safety programs.

2. Two data collection instruments were designed. The questionnaire was designed to determine: (a) the status of industrial safety procedures, (b) the practices of management regarding safety, and (c) the extent of management acceptance of responsibility for industrial safety in accordance with the basic elements of any safety program. The second instrument was an interview schedule and it was designed to determine the status of government activities and to provide information concerning the extent of the government's involvement, practice and responsibility for industrial safety.

3. The questionnaires were personally delivered to 119 industries and personally collected from 103 industries--a return rate of 86.6%.

4. Interview sessions were held with 20 government officials in both administrative and educational branches of the government.



The findings indicated:

1. Lack of leadership in managing the safety function by industry's management.
2. Inadequate management knowledge of its responsibility and function for accident prevention.
3. Inadequate safety training for supervisors and employees, and of making safety training an organizational requirement.
4. Insufficient records on work-related injuries, lost work time, and cost of accidents.
5. Insufficiency of clearly established procedures and defined requirements for physical surveys.
6. Absence of medically trained personnel in industrial facilities.
7. Lack of management's activities in motivating workers in safety and promoting safe work habits.
8. Inadequate government support and activities for industry regarding safety.
9. Inadequacy of government involvement in safety.
10. Insufficient government accident records.
12. Absence of a government industrial safety policy.

The conclusions drawn from the study were that the management of Saudi Arabian industry evidenced a minimal leadership role in managing the safety functions of their organizations. Management's knowledge of its responsibility for preventing accidents was insufficient. The government's current practices, activities and safety measures for the prevention of industrial accidents were minimal. In addition, there

was an apparent insufficient involvement and coordination among the many different government ministries and agencies in industrial safety. Efforts should be initiated to bring about greater awareness and activity on the part of industry and government in respect to safety programming and accident prevention.

CHAPTER I  
INTRODUCTION

The social, economic, and political transformation of developing countries like Saudi Arabia is inconceivable without massive technologicalization. Weidner (1968) observed that industrial development plans and policies are principal independent variables in the process of modernization. The justification for industrial development in these change-oriented countries could be explained in terms of ambitious "century-skipping" social and economic aspirations (Sigelman, 1971). Saudi Arabia is one example of these kinds of countries and it has put great emphasis on establishing a diversified industry, infrastructure, and socially and politically institutionalized technology (Farsy, 1980). Industrialization through acquisition and institutionalization of technology has, therefore, become a top priority for the modernization of Saudi Arabia. The country's three Five-Year Plans provide the direction for this modernization.

In the earlier stages of industrialization there are many indications that the level of accidents tends to be quite high (Florio, Alles, & Stafford, 1979; Gordon, Akman, & Brooks, 1971; Simonds & Grimaldi, 1956). The National Safety Council (NSC, 1977) reported that it took the West nearly a hundred years to realize the psychological and economical impacts of industrial accidents on society. Industrial accidents weaken the country by squandering the human and material resources that form its economic base (Florio, et al., 1979).

Saudi Arabia suffers from certain major constraints associated with industrialization; these constraints are: (a) small population of 7,012,642 (Saudi Arabia Central Department of Statistics, 1974), (b) lack of technological and management know-how, and (c) lack of technical and skilled manpower (Algozaibi, 1977). Hence, there is an overdependence on a foreign work force to supply some of the labor and managerial talents required to industrialize the country.

The Saudis do not have the luxury of permitting industrial safety programs to evolve at a slow rate. In a country like Saudi Arabia, which is faced with an increasing demand for talented trained people, it becomes even more imperative to introduce measures of industrial safety so that experienced as well as inexperienced personnel are not decimated due to a lack of an effective industrial safety program.

#### STATEMENT OF THE PROBLEM

The problem of this research was to determine the present industrial safety measures in selected Saudi Arabian industries, and to determine the status of government activity and involvement in industrial safety.

#### SIGNIFICANCE OF THE PROBLEM

In the United States the incidence rate and tangible costs of accidents is on the rise (Accident Statistics that Jolted OSHA, 1978; NSC, 1980). More than 13,000 workers are killed each year as the result of industrial accidents. More than two million workers are injured on the job. On any given workday, over 50 employees will be

killed, and 8,800 will be disabled (NSC, 1980). Over 500,000 workers are disabled by occupational diseases from the effect of materials and chemicals such as asbestos, lead, silica, carbon monoxide, cotton dust, and dyes (Gordon, et al., 1971; Flippo, 1976). The economic loss reached \$27 billion and 245 million man-days lost in 1979 (NSC, 1980).

Although these accident statistics are high, evidence shows that work accidents have had a considerable decline of 71% between 1912 and 1976, and the work force is now twice as large and produces more than seven times as much (Florio, et al., 1979). Since the turn of the century a great deal of emphasis has been placed on industrial safety. This was due in part to the poor working conditions and high accident rates during and after the industrial revolution (Heinrich, Petersen, & Roos, 1980).

Saudi Arabia is presently undertaking massive industrialization and technologicalization programs as evidenced by its three Five-Year Plans. Since the level of accidents tends to be high in the early stages of industrialization and Saudi Arabia has a small population and suffers from the lack of skilled workers, industrial accidents could seriously hamper Saudi Arabia's development. Therefore, determining, developing or improving and incorporating industrial safety measures into Saudi Arabia's industrialization programs would be appropriate to one of the goals of its third Five-Year Plan (1980-1985): to increase the availability of national manpower.

The Saudi Arabian Standards and Measurements Organization is currently involved in establishing industrial safety standards. The

organization has a contract with an American firm for the development of such standards (Mullah, Note 1).

In an internal report to the Department of Environmental Health of the Saudi Ministry of Health (Hasanain, Note 2), it was indicated that there are present deficiencies in the following areas:

(a) availability of specialized occupational health personnel and facilities, (b) rules and regulations for the prevention of occupational hazards in most industrial organizations and small businesses, (c) availability of plans for all branches of the government that supervises the protection of workers, and (d) a unified national plan in the prevention and treatment of occupational hazards.

As the industrialization process within a country becomes more complex, the implementation of industrial safety measures may become more difficult to incorporate into the industrial system. Therefore, Saudi Arabia may find it advantageous to determine its industrial safety measures as an integrated part of its rules and regulations at an early stage of industrialization. This research could contribute to that end.

#### PURPOSE OF THE RESEARCH

The purpose of this research was to determine the safety measures employed in Saudi Arabia, compare these to the literature and offer some recommendations for improvement which might help as the Saudi authorities plan and work toward solving the problem of increasing the availability of national manpower through effective industrial

safety programs. More specifically answers to the following questions were sought:

1. How does management in Saudi Arabian industry show leadership for accident prevention?
2. How does management hold lower echelons accountable for accident prevention in Saudi industry?
3. What safety training does management provide for workers in Saudi industry?
4. What systems of accident reporting and recording are practiced by Saudi industry?
5. How often are physical surveys of plant facilities conducted and who is responsible for them in Saudi industry?
6. What medical support systems are employed in Saudi industry?
7. What safety motivational activities does management promote in Saudi industry?
8. What industrial safety measures are currently being practiced by the Saudi government for preventing industrial accidents?

#### LIMITATIONS OF THE RESEARCH

This research was limited to:

1. Availability of documented industrial accident data from government and industrial sources.
2. The willingness of the government and industrial sources to provide information to the researcher.

3. Industrial organizations in Jeddah and Riyadh which accounts for 57 percent of total operational private industries in Saudi Arabia (Saudi Arabian Ministry of Industry, 1980).

4. Data from these industries from the last two years (1980-81) of industrial operations.

#### ASSUMPTIONS OF THE RESEARCH

This research was conducted under the assumptions that:

1. The respondents would honestly provide information regarding their industrial safety program.
2. The responses of the industrial representatives were descriptive of the actual industrial safety practices.

#### DEFINITION OF TERMS

For the purpose of this research the following terms were defined:

Safety is "the minimization of injury and loss resulting from nondeliberate acts such as accidents and natural calamities" (Worick, 1975, p. 2).

Accident is "an unplanned and uncontrolled event in which the action or reaction of an object, substance, person, or radiation results in personal injury or the probability thereof" (Heinrich, et al., 1980, p. 23).

Injury is "any cut, fracture, sprain, amputation, etc., which results from a work accident" (Daubenspeck, 1974, p. 18).

Minor injury is an injury which does not result in lost time to the employer.



Lost time is a time of half a day or more lost to the employer as a result of work injuries.

Unsafe act is "the departure from an accepted, normal, or correct procedure or practice, an unnecessary exposure to a hazard, or conduct minimizing the degree of safety normally present" (DeReamer, 1958, p. 19).

Unsafe condition is "any physical condition that if left uncorrected may lead to an accident" (DeReamer, 1958, p. 19).

Technologicalization is a process of implementing modern systems of efficient production and manpower utilization which may include hardware and/or software.

Industrialization is a process of creating all types of industry for the production of durable and consumable goods which include both large- and small-scale production.

Measures are the governmental and managerial functions of planning; organizing; coordinating; directing; controlling by appropriate restraints, regulations, standards; and the motivating activities and practices of industry for the purpose of preventing industrial accidents.

#### ANALYSIS AND EVALUATION

Analyses, evaluations, and interpretations of data were based on descriptive statistics. Since this research was concerned with the status of industrial safety in Saudi Arabia, descriptive analysis of the data was appropriate. Best (1977) reported that descriptive statistical analysis is employed as a means to reach generalizations

about a particular group of individuals and limits generalizations to that group only, in this case Saudi industry in the two major cities of Jeddah and Riyadh. Valuable information about the nature of that group will be provided by this method of analysis.

Statistical analyses and interpretations of the survey results were performed by calculating frequencies, percentages, means and standard deviations, where appropriate, of the responses. Evaluation, analysis, and interpretation of the interview questions are presented in Chapter IV. Results of the interview questions were used to augment the results of the survey. Conclusions and recommendations were drawn based on the analyses and interpretations of the data from both the survey and the interview results.

CHAPTER II  
REVIEW OF RELATED LITERATURE

In the Middle East, Saudi Arabia is a unique country in many ways. In terms of Gross Domestic Products (GDP) it has the 16th highest in the world. Its per capita income is the sixth highest in the world (Reader's Digest Association, 1981). It has proven petroleum reserves of 173 billion barrels and produces between 8.5 to 10 million barrels per day, depending on world economy and demands (Department of State, 1979). It occupies most of the Arabian Peninsula. The total area of Saudi Arabia proper is 865,000 square miles. It is one of the most bleak desert countries in the world. It has no rivers, no perennial streams, and no lakes (Stacey International, 1978). Its political structure consists of a monarchy committed to the maximization of the welfare of the people at large within the shortest possible time without rupturing the religious and moral values of the country (Saudi Arabia Ministry of Planning, 1975).

Revenues from oil have given Saudi Arabia a unique opportunity to raise the material and social standards of living of its people. The magnitude of these funds has propelled its leaders with the ambition to put Saudi Arabia within the ranks of the most advanced societies.

The Saudi leadership--well aware of its only natural resource, petroleum, and that it will run out within a few decades--made plans to move away from relying on a finite source to an industrial-based economy. Three developmental plans that provide the direction for modernizing Saudi Arabia, in the shortest possible time, were drawn up.

The planning in its real sense started with the introduction of the second Five-Year Plan. The Government's first Five-Year Plan 1970 to 1975 was a mixed broad plan and not every program in it was fully implemented. The plan, for all practical purposes, was an exercise in future thinking and experience gained by the Ministry of Planning. Also, the real boost in the Saudi economy came after the 1973 oil embargo, and the new price structure of petroleum (Farsy, 1980; Crane, 1978).

The Saudi Government's second Five-Year Developmental Plan 1975 to 1980 identified three goals. First, is the diversification of the Kingdom's economic base by establishing new industries through the construction of large petrochemical factories, petroleum refining, steel and iron, and glass and aluminum complexes in the towns of Jubail and Yanbu on the East and West coasts respectively. These towns will ultimately become the major industrial areas with the objective of exporting petroleum and petrochemical products throughout the world. Second, the plan focused on improving and enlarging its manpower base by emphasizing vocational and technical training, and third, the development of non-petroleum industries throughout the country. The plan provides for the establishing of various industries such as canning, minerals, construction material, textile, leather, fisheries, and synthetics (Saudi Arabia Ministry of Planning, 1975).

To accomplish these goals the plan called for spending \$146 billion and a requirement of total labor force of 2.33 million workers. The actual labor force employed during the plan was 2.471 million workers of whom 43% or 1.06 million were non-Saudis (Saudi

Arabia Ministry of Planning, 1975, 1980). The thrust of the second Plan was toward the establishment of the infrastructure and the industrial base. This was needed in order to attain the crucial objectives of diversifying the sources of the Saudi national economy and national self-sufficiency.

The Saudi Government's third Five-Year Plan 1980 to 1985 identifies the following three major goals. The first goal of the plan has three interrelated subgoals: (a) conservation of oil and gas for the longest possible time so as to increase the long-term potential by fixing the level of crude production, (b) accelerating the diversification of economic development by giving priority of investment to the private sector of agriculture, industry, and mining, and (c) giving particular attention to the development of infrastructure for the support of the hydrocarbon-based industrial complexes of Jubail and Yanbu.

The second goal of the plan emphasizes high growth more selectively, and aims to consolidate rather than expand the foreign labor force. This will be done by the government in encouraging and assisting all members of the Saudi society to make an effective contribution to the development of the nation, reducing both the numbers and roles of foreign manpower, and assisting the Saudi society in dealing with the problems of rapid economic and social change. The government will give particular attention to adult education for the goal of total eradication of illiteracy within the shortest possible time.

The third goal of the plan is concentrating on maximizing the utilization of domestic and foreign skilled manpower through

emphasizing capital-intensive development in hydro-carbon and other manufacturing industries in agriculture and mining.

The third Five-Year Plan emphasizes that "this will accelerate diversification which is one of the dominant structural objectives of the whole economic development process" (Saudi Arabia Ministry of Planning, 1980, p. 16). Manpower development has the highest national priority and is the key element in the whole strategy of the third Plan. The objectives for manpower development in the plan are: (a) to increase the total number of available national manpower, (b) to increase the productivity of manpower in all sectors, (c) to deploy manpower to those sectors with the greatest potential for growth and highest productivity, and (d) to reduce dependency on foreign manpower. The plan calls for spending \$230 billion and a requirement of a total labor force of 2.626 million workers of whom 41% (1.068 million) are foreign (Saudi Arabia Ministry of Planning, 1980).

The focus of the third Plan is the conservation of oil and gas and accelerating the process of economic diversification through participation of the private sector in manufacturing industries in agriculture and mining. The increasing of Saudi and the reduction of foreign manpower is the key element in the whole strategy of the third Plan. Since Saudi Arabia has a small population, a lack of technological and management know-how, and a lack of technical and skilled manpower, industrial accidents may add to this problem.

Accidents have both economic and social impacts. The economic impacts may include the cost of training, retraining, loss of machines

and facilities, higher insurance rates, medical expenses, compensation and so forth. The non-economic impacts of accidents are thought to be of a psychological and social nature. The psychological impacts of accidents are on the individual and his family and the suffering they have to experience--especially if the accident was serious and resulted in impairment or death. The social impacts of accidents are the burden that society bears in supporting welfare and rehabilitation programs, and the replacement of a trained worker by one who may be less trained or less experienced. In Saudi Arabia the social impact of such accidents, in addition to the above, is the increased dependence on the imported labor (Simmonds & Grimaldi, 1956; Hiernich, 1959; Petersen, 1975).

#### SAFETY MANAGEMENT'S PRINCIPLES AND THEORIES

Eliminating industrial accidents is vitally important to the public interest because such accidents are costly to industry and society. Accidents hamper individual and group productivity, wasting manpower and resources. They also produce economic and social loss and a slowdown in the advancement of standards of living in addition to the physical and mental anguish caused by the accident (NSC, 1977).

Practical safety measures could prevent almost all hazards or accidents. The following are the reasons for preventing accidents:

1. Needless destruction of life and health is a moral evil.
2. Failure to take necessary precautions against predictable accidents involves moral responsibility for those accidents.

3. Accidents severely limit efficiency and productivity.
4. Accidents produce far-reaching social harm. (NSC, 1977, pp. 2-3)

Industrial accidents also caused far-reaching social harm in the early days of western society when the birth of industrial power and industrial safety were not simultaneous. In their book Industrial Accident Prevention, Heinrich, Petersen and Roos (1980) discuss the history of industrial safety measures in western societies, which shows that fatal and disabling accidents were common during the early industrial days. Accidents were accepted as part of industry and neither employers nor employees were aware of the societal and moral losses from industrial accidents.

No legislative steps were taken to prevent accidents and little was done until plant management began to insist on safe working practices. Then, progress was made in plant safety and people began to realize that society as a whole benefits from good plant safety practices or loses with lax practices. All too often this realization and the legislation did not occur until after some plant catastrophe because of poor safety practices. Only then did people understand that the loss of property, and especially the loss of human potential, diminishes the whole of society (Heinrich et al., 1980).

Industrial accidents and their costs have a ripple effect on an entire society from the plant management down to the worker's family. The cost of accidents has an impact on the individual and his family, on the rising cost of a product through paying higher insurance premiums, and on training and welfare.



In Saudi Arabia, an additional societal cost and impact is the increase in the foreign labor presence. If Saudi Arabia is to meet the government's plan to increase the availability of national manpower and reduce foreign labor, industrial safety and accident prevention must be part of the plan to assure safe, healthful working conditions and to preserve Saudi human resources.

#### Objectives of Accident Prevention

Simonds and Grimaldi (1956) in Safety Management: Accident Cost and Control say the primary purpose of accident prevention is to halt personal injury and death. They cite four possible unhappy consequences from personal injuries: the immediate suffering of the person who has been hurt; the possibility of some permanent impairment; the economic effects of injuries on the workers and their families which could result in loss of income or breakup of family; and a country's loss of human resources.

A second objective of accident prevention is to reduce production or operating costs for the sake of profits. Cost reduction provides a direct reason for preventing all kinds of accidents from those that result in injuries, to those that disrupt production or cause property damage (Simonds & Grimaldi, 1956).

Accidents do make a difference in the cost of doing business. Accidents interrupt the orderly process, they require that new personnel be trained, they mean breakdowns and a general disturbance of the coordinated work efforts (Simonds & Grimaldi, 1956).

H. W. Heinrich in his book Industrial Accident Prevention (1959) directed greater attention not only to "accident causes" but also to the large family of accidents that could result in property damage but did not involve personal injury. He postulated this relationship: 1 to 29 to 300--that is, one disabling injury to 29 of the minor injury type to 300 of the noninjury type. This huge group of noninjury-type accidents are erroneously referred to as near-miss accidents, even though they are accidents and may involve a tremendous amount of property damage.

Injuries and industrial accidents are like an iceberg. The small part that is seen above the surface of the water is only part of the real problem. The larger part is hidden under the surface of the water and this is where the real problem is (Wilkinson, 1979). It is believed that for every disabling or fatal industrial accident there are 32 lost-time injuries, 350 near-misses which could have been lost-time cases, and 2,800 minor injuries like hand cuts or abrasions. These 2,800 cases are considered to be the under the water part of the iceberg (Wilkinson, 1979). Most safety specialists reviewed in the literature feel that industrial organizations should pay close attention to these minor injuries and their causes.

Heinrich's study clearly pointed out that the frequency of accidents that do not involve injury is much greater than the frequency of those that do. This is interpreted as a call for action, as a need to direct the safety program to this broader base, as motivation to include all accident types and not only eliminate a greater proportion of the practices and conditions that cause

accidental injury but also remedy the causes of extensive economic losses in property damage (Heinrich, 1959).

Simonds and Grimaldi (1956) also state that frequent accidents can cause workers to lose confidence in their leaders. Frequent accidents may suggest incompetent or an unconcerned management who do not aspire to effective leadership. Such management will also find it more difficult to hire and retain workers. Prospective employees may tend to stay away from a company with a poor accident record unless other compensations like higher wages or shorter hours are offered.

The NSC (1977) Accident Prevention Manual reports that companies that ignore safety efforts, whether those companies are large or small, will probably have more than their share of work accidents and injuries. However, small companies with fewer than 100 employees have more industrial accidents in proportion to their size than do larger corporations (NSC, 1977).

#### Causes of Accidents

Worick (1975) and Florio et al. (1979) classify accident causes into five general areas:

1. Inadequate knowledge--Knowledge is essential for developing desirable attitudes toward safe behavior. Today, when technology changes so rapidly creating potential new hazards, education and training are important to help people cope and understand technological advances and accident prevention.

2. Insufficient skill--Accidents occur when people try to perform tasks beyond their skill level. This is affected by such factors as the person's strength, vision, emotions, attitudes and fatigue.

3. Improper attitudes and habits--Accidents can be reduced by improving habits and attitudes such as carelessness, irresponsible and selfish conduct, or the idea that accidents are caused by fate. Changing behaviors first usually results in an attitude change. However, management must work diligently to change workers' behavior in order to affect attitude changes.

4. Unsafe behavior--Failure to develop proper habits, behaviors and knowledge about safe conduct and practices will result in more accidents.

5. Environmental hazards--Even though modern technology is engineered for safety, hazards, in part due to new technologies, still exist. Management must make sure that operations and environments are engineered to minimize and eliminate the hazards.

In summary, accidents are "caused," they do not "just happen." It is not uncommon to find educated professionals like lawyers and doctors, trained to think and look for causes, who believe accidents are uncontrollable and can be attributed to "an act of God," or bad luck (DeReamer, 1980).

Managers and employees must be convinced that accidents are caused and that steps can be taken to prevent them. If people believe in those two ideas plus the fact that the same type of accident will recur if not corrected, this will strengthen the conviction that

accidents are caused. The need for immediate corrective action should be emphasized again and again (Petersen, 1975).

The problem of industrial safety in organizations is immense. Research into the causation of accidents is no simple matter. As researchers begin to look closely at specific accidents it becomes apparent that accidents are the result of a complex combination of events and that it's quite difficult to pinpoint one cause as the prominent accident factor (Stilkind, 1977). However, effective prevention of accidents for the future is contingent upon the determination of the causes of past accidents (DeGreene, 1970). Careful analysis of past accidents can lead to the prediction and elimination of future accidents (DeGreene, 1970).

#### Axioms of Industrial Safety

H. W. Heinrich was one of the pioneers of industrial safety. In 1931, he spelled out for the first time, and again in 1980, a foundation for industrial safety programs. His foundation was a set of principles or axioms.

#### The Axioms of Industrial Safety

1. The occurrence of an injury invariably results from a completed sequence of factors, the last one of these being the accident itself. The accident in turn is invariably caused or permitted directly by the unsafe act of a person and/or a mechanical or physical hazard.
2. The unsafe acts of persons are responsible for a majority of accidents.
3. The person who suffers a disabling injury caused by an unsafe act, in the average case has had over three hundred narrow escapes from serious injury

as a result of committing the very same unsafe act. Likewise, persons are exposed to mechanical hazards hundreds of times before they suffer injury.

4. The four basic motives or reasons for the occurrence of unsafe acts provide a guide to the selection of appropriate corrective measures. They are:
  - Improper attitude
  - Lack of knowledge or skill
  - Physical unsuitability
  - Improper environment
5. Four basic methods are available for preventing accidents:
  - Engineering revision
  - Persuasion and appeal
  - Personnel adjustment
  - Discipline
6. The severity of an injury is largely fortuitous--the occurrence of the accident that results in injury is largely preventable.
7. Methods of most value in accident prevention are analogous with the methods for the control of quality, cost and quantity of production.
8. Management has the best opportunity and ability to initiate the work of prevention; therefore, it should assume the responsibility.
9. The supervisor or foreman is the key man in accident prevention. His application of the art of supervision to the control of worker performance is the factor of greatest influence in successful accident prevention. It can be expressed as a simple four-step formula:
  - Identify the problem
  - Find and verify the reason for the existence of the problem
  - Select the appropriate remedy
  - Apply the remedy
10. The humanitarian incentive for preventing accidental injury is supplemented by two powerful economic factors:
  - The safe establishment is efficient productively and the unsafe establishment is inefficient.
  - The direct employer cost of occupational injuries for compensation claims and for

medical treatment is but one-fifth of the total cost which the employer must pay. (Heinrich et al., 1980, p. 21)

### The Domino Theory

Heinrich's principles or axioms led to the evolution of the Domino Theory which most safety texts have used to develop new theories. Heinrich (1980) said, "The occurrence of an injury invariably results from a complete sequence of factors, the last one of these being the injury itself. The accident, which caused the injury, in turn is invariably caused or permitted directly by the unsafe act of a person and/or a mechanical or physical hazard" (p. 21).

He linked this sequence to a series of five dominoes standing on edge and called this the Domino Theory, and labeled each one as follows:

1. ancestry or social environment
2. fault of a person
3. unsafe act or condition
4. accident
5. injury. (Heinrich et al., pp. 22-23)

Removing the middle domino will stop the sequence which results in the injury. The domino theory simply summarizes that, if you are to prevent loss, remove the unsafe act or the unsafe condition.

Petersen (1978) states that removing the unsafe act or unsafe condition is only removing the symptom, not the cause of accidents. This means the root cause remains and can lead to another accident. Root causes often relate to the management system--management's policies and procedures, supervision effectiveness, training, lack of

inspection procedures, undefined responsibilities, etc. Correcting root causes would have permanent results on the single accident being investigated and on future accidents and operational problems. This is the main idea of the multiple causation theory.

### Multiple Causation Theory

There are many causes of accidents each with contributing factors that alone probably would not mean an accident, but together add up to a "cause" of an accident. Because there are so many closely related contributing factors to accident causes, accident victims may violate safety rules for years without creating an accident. But, this does not guarantee that an accident would not occur on a first-time violation or later (Petersen, 1978).

A. L. Thygerson in Safety: Principles, Instruction, and Reading (1972) cites the following three sets of factors which interact to cause an accident: (a) host or human factor which includes a consideration of age, sex, marital status and physical condition, (b) agent factor which may be described as the object most closely associated with the accident or those things which inflict injury, and (c) environmental factors which include time, weather, season, location or place, and geography.

Thygerson (1972) says that once the host, agent and environmental factors have been identified, corrective measures can be taken to:

1. Make the "host" less susceptible to accident by education, training and use of protective equipment.



2. Make the "agent" less hazardous by engineering and modifications.
3. Modify the "environment" by layout changes, better lighting, placing guards, etc. (p. 38)

### The Anatomy of an Accident

In almost every situation, there is an interplay of many environmental and people factors that must come together in the right combination to produce an accident. Generally, eliminating or changing any one factor in the accident chain can keep an accident from happening (DeReamer, 1980).

The anatomy of even simple accidents may represent a combination of immediate and contributing causes that include:

- The environment
- The training
- Discipline
- Lack of skill
- The psychological impulse
- A point in time
- The physical and mental condition of those involved
- The condition of the equipment involved
- The location of other equipment and individuals
- The attitude and alertness of others nearby
- The unsafe act
- The unsafe condition. (DeReamer, 1980, pp. 55-56)

### Components of the Accident Chain

It is vitally important to identify and evaluate each of the components in the anatomy of an accident, to make in-depth studies and analyses of the accident. This will help safety personnel and managers select a point of attack for accident prevention work. DeReamer (1980) suggests that safety personnel and managers should

deeply study and analyze the accident, results of the accident, immediate cause, and contributing causes. A detailed example of these four components was given by DeReamer.

### Components of the Accident Chain

1. The Accident
  - a) fall
  - b) slip
  - c) slide
  - d) collision
  - e) being caught in or between
  - f) eruption or explosion
  - g) burn
  
2. Result of the Accident
  - a) annoyance
  - b) production delays
  - c) reduced quality
  - d) spoilage
  - e) property damage
  - f) minor injuries
  - g) disabling injuries
  - h) fatality
  
3. Immediate Causes of Accidents
  - a) unsafe acts
    1. protective equipment or guard provided but not used
    2. hazardous method of handling
    3. improper tools or equipment used
    4. hazardous movement
    5. horseplay
  - b) unsafe conditions
    1. ineffective safety devices
    2. no safety device although one is needed
    3. hazardous housekeeping
    4. defective equipment, tools or machines
    5. improper apparel for job
    6. improper illumination, ventilation, and so on
  
4. Contributing Causes of Accidents
  - a) supervisory safety performance
    1. safety instruction inadequate
    2. safety rules not enforced

3. safety not planned as part of the job
4. infrequent employee safety contacts
5. hazards not corrected
6. safety devices not provided

b) mental condition of person

1. lack of safety awareness
2. lack of coordination
3. improper attitude
4. slow mental reaction
5. inattention
6. lack of emotional stability
7. nervousness
8. temperamentalism

c) physical condition of the person

1. extreme fatigue
2. deafness
3. poor eyesight
4. lack of physical qualification for job
5. hearing condition
6. crippling or other handicap. (DeReamer, 1980, pp. 56-57)

### Responsibility for Accident Prevention

Management in a business concern is expected to take whatever steps are necessary to achieve certain goals which may include a long-run profit, benefiting society and regarding the welfare of the employees. Accident prevention is seen as a major task that management should try to achieve by establishing operating principles. Company management should view safe working conditions and practices as fundamental in a fair and cooperative relationship with labor and society. Employee education and engineering techniques are some ways to prevent major accidents and keep a low accident record (Simonds & Grimaldi, 1956).

As suggested by Simonds and Grimaldi (1956), the company owners or board of directors should establish adequate objectives and assign the chief executive the task of implementing the goals. Where top management is personally involved in safety, the whole organization is aware of this and usually that company can successfully prevent accidents.

### Accident Prevention Principles

Hodnick (1980) reports that many industrial organizations are still following the old approach to safety, i.e., the accident that caused an injury is caused either by an unsafe act or an existing unsafe condition. However, it is believed that some of the new methods of safety management systems, which are emerging from the studies and practices of the leading safety authorities, should be adopted by concerned industries and enterprises.

Petersen (1975), an authority in the field, identified five such methods or principles of accident prevention.

These principles are:

1. An unsafe act, an unsafe condition, and an accident are all symptoms of something wrong in the management system.
2. We can predict that certain sets of circumstances will produce severe injuries. These circumstances can be identified and controlled.
3. Safety should be managed like any other company function. Management should direct the safety effort by setting achievable goals and by planning, organizing, and controlling to achieve them.
4. The key to effective line safety performance is management procedures that fix accountability.

5. The function of safety is to locate and define the operational errors that allow accidents to occur. This function can be carried out in two ways: (a) by asking why accidents happen-- searching for their root causes, and (b) by asking whether certain known effective controls are being utilized. (pp. 22-25)

These principles suggest that a safety program is designed to search out the "management" system problems that allow accidents, rather than the "people" problems that cause accidents. These principles also suggest the analysis of the following areas of a company safety program:

1. Safety policy
2. Organization
3. Safety department function
4. Safety's place in the organization
5. Relationship between staff personnel
6. Definition of responsibility
7. Definition of accountability
8. Supervisor's safety measurement
9. Employee's selection
10. Employee's training
11. Supervisor's motivation
12. Management's motivation (Petersen, 1978).

Safety professionals agree that the best approach a company can take is to integrate safety in its operations. This would be a built-in safety system. In other words, it would be a safe production, not production and a safety program, or production and safety.

Management's goal is to reach efficient production which maximizes profits. To reach this goal, management influences two basic resources: (a) employees and (b) facilities, equipment and materials. Management influences employees through training, selection and placement, health programs and employee relations practices. Facilities, equipment and materials are influenced by maintenance, research and engineering (Petersen, 1978).

These influences and basic resources are brought together through various procedures, one of which is safety. The function of safety is to:

1. build safety into these procedures
2. continually audit the carrying out of these procedures to ensure that the controls are adequate. (Petersen, 1980, p. 28)

Safety carries out its function by asking why certain acts and conditions are allowed and whether or not certain known controls exist.

#### Effective Factors in Controlling Accidents

Simonds (1973) notes that the company with a full-time safety director has a big edge in safety. When company-wide safety supervision is a part-time personnel duty, it often becomes secondary to other immediate matters. Making safety the only responsibility of one person ensures that the safety manager will constantly be alert to hazards and will continually remind, persuade, and prod others about them. Of course, it is not practical for many small companies to have a full-time safety specialist. Perhaps this failure to appoint one person with safety as the full assignment is a major reason that the

worst accident records are most often found in small firms (NSC, 1977; Simmonds, 1973).

After the safety manager, the first-line supervisor has the primary safety responsibility. Supervisors are key people in accident control. They are on the spot when accidents occur; they direct the actual operations; and they know the workers, the equipment, and the materials. As accidents become more costly, top managers will probably notice their occurrence. When this happens, those supervisors directly involved will be encouraged, from above, to follow better safety practices (Steele, 1974).

When an accident does occur, it indicates that somewhere along the line someone has not done a good job of accident prevention.

DeReamer (1980) in Modern Safety and Health Technology offers the following steps to control contributing causes of accidents:

1. Supervisor's Safety Performance
  - a) job-hazard analysis
  - b) enforcement of safety rules
  - c) adequate safety knowledge
  - d) promotion of employee participation in safety
  - e) proper job placement
  - f) development of safe working conditions
2. Mental Condition of Person
  - a) regular safety contacts by supervisor
  - b) adequate safety indoctrination and on-the-job safety training
  - c) safety promotions and publicity
  - d) employee participation in safety program
  - e) regularly scheduled safety meetings
  - f) adequate supervisor/employee communication on all matters concerning safety of the employee

### 3. Physical Condition of Person

- a) preplacement physical examination
- b) periodic reexamination
- c) proper job placement
- d) adequate medical facilities
- e) careful check of physical condition of worker on all transfers and changes in job
- f) recognition of the physical limitations of workers, new to a job, especially if heavy work is involved. (pp. 58-59)

#### Safety Management Concepts

Safety has been recognized as an operating function that is every bit as essential to an overall operation as engineering, finance, marketing, personnel, production, and transportation. Therefore, the safety function can be managed most effectively using methods comparable to those used in the other management functions (Marcum, 1980).

One of the methods for managing safety functions strongly recommends using managers and supervisors to implement safety programs, rather than assigning the safety function as an unimportant side job of any person in the organization. Individuals operating independently are seldom able to initiate and maintain safe performance patterns. Instead, the formulation, implementation and maintenance of needed safety plans must be recognized as the responsibility of management personnel. Such plans can best be issued and continued as a comprehensive safety management system (Marcum, 1980).

Most literature reviewed indicated that if management does not support a safety program, there are probably two main reasons why:  
(a) the safety program activity is not of sufficient high quality to



demand management's attention, or (b) management is not fully aware of the safety function's potential to improve the process of decision making (Marcum, 1980; Hodnick, 1980; Baldwin, 1976).

Effective safety management may require formal education to make management more aware of the potential of safety activities. Practical managers are finding out that success or failure of a broad accident prevention program depends on how well managers manage. Pope (1981) reports that educators, safety professionals and leaders in government, industry and labor all stress the need to integrate industrial safety management education into business administration courses.

Effective safety management must be an integral part of a company's strategy at all levels (Baldwin, 1976). To make this possible, top management must establish a strong safety philosophy. Instead of approaching safety problems as individual occurrences, a company should have an integrated or complete safety program.

Baldwin (1976) reports that a safety management system that measures safety performance and demands accountability from all management levels will decrease a company's operating costs. Other sources show that accident reduction is generally accompanied by cost savings greater than the safety expenditures, including workmen's compensation insurance and statistically measurable uninsured costs, as well as many intangibles (Simonds, 1973).

### System Approach to Safety

A system is composed of many components such as machines, tools, materials, environmental factors, people and documents. All components are interconnected and depend on each other for the system to function properly. A failure in any one component degrades the performance of the whole system (Worick, 1975). In a system's approach to safety, all components of the system--people, machines and materials--must be made safe to keep the system functioning optimally (Worick, 1975).

Training is an important element in a safe working environment for employees. In developing countries, many occupational accidents happen because workers without training or preparation are taken from a rural environment to an industrial urban environment. The same kind of problem also arises in industrialized countries, although to a lesser degree. Workers have a lack of knowledge and literacy and have difficulty adapting to the industrialized setting (International Labor Office, 1976). Management, then, must try to create a safe working environment. This means meeting physical and emotional needs of the workers because environmental aspects can both enhance or adversely affect employees' health at work and outside the work environment (Gardner & Taylor, 1975).

The work environment may be the cause of occupational diseases, or the two elements--work environment and disease--may only, by chance, be found together. When the time interval is short between cause and effect of environment and sickness, it is usually easy to see the causal relationship between event(s) and diseases or injuries.

However, many occupational diseases take time to develop, and it is sometimes difficult for a physician to discover if a disease is related to a person's occupation (Gardner & Taylor, 1975).

#### Development of Safety Awareness

A lack of safety awareness is a significant factor in the cause of accidents. As the change is made from considering only the immediate causes of accidents (unsafe acts and unsafe conditions) to also considering contributing causes of accidents (supervisory safety performance and the person's mental and physical condition), managers and supervisors will want to concentrate more on developing safety awareness. The aim is to help people develop a sixth mental "safety" sense so whenever there is an element of danger, the worker will react the safe way (DeReamer, 1980).

Affecting changes in safety awareness can be done through training, repetition and constant correction. Once the work group sees that a system of rules is necessary for an organization to function effectively, they will understand that adhering to acceptable standards of performance is good for them. There will be no confusion about what management expects of workers and there will be few rule violations.

However, some employees may react negatively to safety rule enforcement. DeReamer (1980) lists three reasons why safety rules are not followed:

1. Rules at fault.

2. Employees at fault--a lack of knowledge, a physical limitation, poor judgment, and faulty attitude may be the basis for any employee's failure to conform to existing safety rules.
3. Supervisors at fault. (pp. 177-184)

Some negative reactions from employees should not deter management from establishing safety rules. A system of rules is necessary for an organization to function effectively.

The National Emphasis Program Defined (1976) indicated that any long-term reduction in injuries and exposure to material which is hazardous to health will only be obtained through a well-designed and fully implemented safety and health program matched by an improved employee education and training program in order to increase the awareness of the workplace hazards.

#### Characteristics of Low-accident Organizations

One of the most consistent findings in the reviewed literature was that factories with successful safety programs had a strong management commitment to safety. This commitment was exhibited in several ways. Cohen, Smith and Cohen (1975) and Mobley (1974), all found that in low-accident companies, top management was personally involved in safety activities on a routine basis; whereas such a commitment was conspicuously absent in high-accident companies. Cleveland, Cohen, Smith and Cohen (1978) reported that in low-accident companies safety matters were given high priority in company meetings and production scheduling. These companies viewed safety as an integral part of the production system and felt accidents were actually symptoms of system design faults.

A study assisted and directed by Simonds (1973) showed that in firms with lower work injury frequency and severity rates, top management was highly interested and involved in the company's overall safety program. Top management actively participated in and supported safety activities. In firms with better safety records, the chief executive put more emphasis on personal audit and inspection than did those in firms with poorer records. Top management, in the successfully safe firms, also showed more interest in safety plans and held review and analysis meetings to evaluate their progress. Another expression of management commitment that separated high- and low-accident companies was the rank and status of safety officers. In the better performing companies, the safety officers had a higher status. This finding was reported by Cohen et al. (1975), Davis and Stahl (1964), and Planek, Driessen and Vilardo (1967).

A second highly consistent organizational characteristic discriminating between companies was the emphasis put on safety training. In companies with good safety records, safety education was either an integral part of new workers' training (Cohen et al., 1975; NSC, 1977; Mobley, 1974) or was used in follow-up and periodic retraining for workers and supervisors (Davis & Stahl, 1964; Planek et al., 1967). A third characteristic was the existence of open communication links and frequent contacts between workers and management (Cohen et al., 1975). Another expression of open communication was found in companies where appropriate personnel carried out frequent safety inspections (Cohen, 1977).

General environmental control and good housekeeping was the fourth consistent characteristic. Orderly plant operations, controlled environmental conditions, and high usage of safety devices were found in low-accident companies (Smith, Cohen, Cohen, & Cleveland, 1975). A fifth characteristic was a stable work force with older workers and less turnover (Cleveland et al., 1978; Cohen et al., 1975; Davis & Stahl, 1964). Although not specifically studied, this factor reflected better industrial relations and elaborate personnel development practices.

Finally, low-accident companies showed distinctive ways of promoting safety. These included guidance and counseling rather than enforcement and admonition, individual praise or recognition for safe performance, and enlisting workers' families in safety promotion (Cleveland et al., 1978; Davis & Stahl, 1964; NSC, 1977).

By integrating all of these characteristics, one can form a coherent organizational pattern of a highly safe company where management is actively involved in safety programs. Management creates an administrative climate (Grimaldi, 1970) which results in increased performance reliability of workers, good housekeeping, and high design and maintenance standards for work environments. Such a climate includes well-developed safety programs, communication channels regarding production and safety matters that are kept open between workers and managers, and a general management philosophy that is production oriented and people oriented.

### Essential Managerial Functions for Implementing Safety Programs

To implement a safety program, there are three critical management functions--communicating, motivating and training (Bird & Germain, 1966).

#### Communicating

To communicate, a manager must try to get others to understand what he has in mind and also get himself to understand other's goals. Communicating is a two-way street of understanding between manager and workers. Bird and Germain (1966) point out that for good communication what is spoken must be listened to, interpreted and understood; what is written must be read, interpreted and understood; and what is done must be observed, interpreted and understood. Communicating is more than a one-way street so that listening, reading and observing are just as important as the speaking, writing and behaving (Hersey & Blanchard, 1977).

#### Motivating

Managers inspire, encourage and move others to take action by creating conditions that cause people to do things willingly and enthusiastically. Bird and Germain (1966) also discussed the motivation principle of reciprocal interest. That is, people are motivated to accomplish desired results to the degree that a manager shows interest in the desired results. Thus, a manager wishing to motivate people should directly relate the desired results to the people's needs, interests and goals.

The motivation principles of participation and recognition also help increase motivation. People who are asked for their ideas, suggestions, and views about decisions affecting their work are more strongly moved to positive action than when decisions are forced on them (Davis, 1977). Since motivation and communication are partly logical but mostly psychological, mental and emotional, managers should feel free to show enthusiasm, appeal to needs, wants, wishes, drives, desires and dreams of other people. Friction, frustration and failure result from misunderstanding and often lack of motivation (Aldag & Brief, 1979).

In accident prevention and other activities, the manager can view motivation as a three-way process:

Up--must motivate superior  
Down--must motivate subordinates  
Across--must motivate others at same level.  
(Bird & Germain, 1966, p. 91)

Bird and Germain (1966) also report that the manager must be self-motivated, self-disciplined and self-propelled to convert plans to actions. Managers may have to face formidable odds and break down barriers. Those actions are part of a manager's job, however, and an important part.

### Training

Training is necessary in all activities of accident prevention to improve people's attitudes, skills and knowledge. Training is a form of communication and motivation (Bird & Germain, 1966).



Creating awareness of the accident prevention problem is one of the manager's first and biggest challenges in training. This job may include collecting and analyzing data, appraising all possible courses of action, synthesizing fragments into a total program, implementing, making a progress report and evaluating the program. To communicate these ideas and actions, the manager may want to use charts, graphs, photos, films, tape recordings, movies and other audio-visual aids to make people aware of the importance and savings' potential of accident prevention (Flippo, 1976).

Creating awareness needs to be followed by moving people to action. A first action step would be the examination and possible revision of existing policies, procedures, regulations and rules, or issuing new ones. For instance, new employees could clearly understand the importance of accident prevention by having an orientation program that stresses total safety (Bird & Germain, 1966).

#### THE IMPACT OF THE OCCUPATIONAL SAFETY AND HEALTH ACT

At one time it was considered reasonable for an industrial worker to be responsible for his own safety. The employer/manager's job was to create a profitable business to pay the workers' wages. It was not acceptable to cut into that profit to protect a careless worker from the inevitable hazards of any industrial enterprise (Bamber & Fraser, 1977). Many corporate managers still believe that careless workers are to blame for accidents (Cortz, 1972).

Fortunately, more farsighted people studied the industrial safety problem. Over the years their work has gradually reduced the loss of

human life and suffering. The pattern of study and problem resolution was quite well defined and progressed through regulation and control (Bamber & Fraser, 1977).

One of the most important regulations implemented was the Occupational Safety and Health Act (OSHA) of 1970. With its passage, the federal government became involved in comprehensive safety matters for the first time (Bamber & Fraser, 1977).

The implications of OSHA were generally "to assure so far as possible every working individual safe and healthful working conditions and to preserve the human resources" (Weren, 1971, p. 41). To accomplish this, the act authorized the Labor Department to set up safety and health standards. It gave government officials the authority to conduct inspections, issue citations, and impose penalties if a safety or health standard violation was found. Finally, the act provided all employees with the means for participating in the process, should the need arise. Such enforcement participation can be assured in two main ways: (a) by employees personally reporting violations of standards or hazardous conditions to the Labor Department, and (b) by reporting such situations to a compliance office during an inspection (Weren, 1971).

Since OSHA became effective in April, 1971, companies surveyed have made significant changes. They have increased their expenditures for safety-related equipment and devices, issued stronger and more numerous safety policy statements, and most recently, started shifting the safety responsibility upward within a company, usually to a vice president of personnel or an industrial relations manager. In

addition, several companies have centralized the safety function at the corporate level to achieve more company uniformity in safety and health standards. The majority of the companies surveyed recognize that OSHA has fostered an increased awareness of safety and health in employees and management (Petersen, 1973).

A Lou Harris poll estimates that six out of 10 companies who now have a safety and health program, did not have a comparable one before OSHA (Sheridan, 1975). In addition, line managers, who before OSHA rarely considered possible occupational hazards, are now more likely to formally check work place conditions for safety standards. The act also stimulated research and educational programs including new professional specialities in the occupational safety and health field (McClay, 1977).

Not only were safety matters being scrutinized in the United States, but also in the United Kingdom where, in 1970, Lord Robens was asked to find ways to improve safety in occupational fields. His insightful 1972 report de-emphasized regulations and emphasized the idea that workers should participate and take responsibility for safety programs. His report stressed the attitude that workers "get it right, so far as is reasonably possible," rather than a mandatory "do it this way" attitude (Bamber & Fraser, 1977, p. 19).

The subsequent 1974 Health and Safety at Work Act of the United Kingdom put the Robens recommendations into law and was a great step forward in the safety field. It placed legal responsibility for safety on the management of work and not merely on its execution (Bamber & Fraser, 1977).

The act advocated an overall organization and management plan rather than mere technical specification. It demanded that everyone on the payroll be involved and responsible for safety, "so far as reasonably practical," but stressed that the ultimate responsibility for safety rested completely with management (Bamber & Fraser, 1977, p. 19).

Even with the passage of OSHA, Cox (1977) points out that large numbers of workers are continuing to be exposed to a variety of potentially harmful chemicals and physical agents. This problem exists because of the introduction of new technologies and chemicals that have not been carefully studied, considered, and understood before their use in industry. Cox added, even when health risks are known, industry at times is reluctant to take the necessary steps to protect workers.

#### SAFETY PROGRAM ORGANIZATION

Safety program organization is defined as the method management uses to share and assign responsibility for accident prevention and to ensure performance of that responsibility (NSC, 1977).

A safety program must be an integral part of company operations; it must be built into every process, product design and operation. It is not a responsibility to be imposed on a company (Anton, 1979). The prevention of accident and injuries is basically achieved by controlling the working environment and people's actions. Only management can implement such control.

The majority of the literature reviewed agreed that the following elements are essential to an effective safety program for any size organization (Anton, 1979; Flippo, 1976; NSC, 1977; Petersen, 1975, 1978, 1980):

1. Management leadership
2. Accountability and assignment of responsibility
3. Training
4. Accident reporting and recording
5. Physical support
6. Medical surveys
7. Motivation

#### Management Leadership

Top management's attitude and approach toward accident prevention is almost always reflected in the supervisors' attitudes. Supervisors will not be interested in preventing accidents if top management is not genuinely interested. Therefore, if management wishes to have employees' cooperation and participation, they must announce and demonstrate their interest in an accident control program (NSC, 1977). They must thoroughly convince employees that they are concerned about accident prevention. This concern must be continually sustained, rather than becoming a temporary involvement when an accident occurs (Hammer, 1981).

If top management wants an acceptable safety performance, they must issue and publish a safety policy to express the direction the organization will follow. More than most other management policies,

a safety policy requires some action from each individual in the organization--from the president to the lowest ranked workers. Only through policy will workers know management's desires concerning safety. The safety policy must be put in writing and publicized so every employee is aware of it, regardless of how other policies are handled (Petersen, 1978).

### Safety Policies

A safety policy is management's first step toward setting a direction and organizing its safety awareness goals. It is best to have a written policy so employees understand the management's direction and assignment of responsibility. Safety policies vary between organizations and are usually tailored to fit each organization. However, the following areas ought to be included as minimum points in a safety policy:

1. Management intent. What does management want?
2. The scope of activities covered. Does the policy pertain only to on-the-job safety? Does it cover off-the-job safety also? Fleet safety? Property damage? Public safety? Fire? Product safety?
3. Responsibilities--who is to be responsible for what?
4. Accountability--where and how is it fixed?
5. Staff safety assistance. If there is staff safety, how does it fit into the organization? What should it do?
6. Safety committees. Will there be committees? What will they do? Why do they exist?
7. Authority--who has it, and how much?
8. Standards--what rules will the company abide by? (Petersen, 1978, p. 35)

Petersen (1978) outlines three general purposes of a written policy:

1. To assert management's will
2. To state responsibility and activities
3. To specify what staff assistance will be provided. (p. 48)

However, even with a written policy, the average company does not design a procedure to measure the safety effectiveness of a line manager's performance. Until companies have such evaluation procedures, safety cannot be accomplished.

#### Accountability and Assignment of Responsibility

The three terms "responsibility," "authority," and "accountability" are closely related. They are sometimes used interchangeably, although they should not be. To have a better understanding of these terms, their definitions are given.

Responsibility is "one's obligation to perform the functions assigned to the best of one's ability in accordance with direction received" (Flippo, 1976, p. 66). Superiors delegate responsibility, but this does not reduce their amount of responsibility. The superior retains full and complete responsibility even though the execution of a task has been largely relegated to others.

Authority "is the right to decide what should be done and the right to do it or to require someone else to do it" (Flippo, 1976, p. 67). The principle of coequal authority and responsibility governs this relationship. This principle states that a commensurate amount of authority should accompany a delegation of responsibility. That

is, a person should have responsibility before receiving authority. Just as responsibility is derived from functional analysis, authority is derived from responsibility (Flippo, 1976).

Accountability is "the requirement of answerability for one's performance" (Flippo, 1976, p. 67). It is the opposite of responsibility--responsibility is delegated downward, while one is accountable upward to some superior. If one has been delegated an amount of authority commensurate with responsibility, one can be held accountable for results (Flippo, 1976).

While top management has the ultimate responsibility for safety, it delegates authority for safety operations commensurate with responsibility through all management levels and holds managers accountable for the results. The company safety policy must detail the procedures for responsible authority and accountability.

Petersen (1978) notes that, "The key to effective line safety performance is management procedures that fix accountability" (p. 48). This is the most important principle in safety. Since safety affects the entire organization, a definite policy is needed for all managers to use to control problems. Safety professionals report that a written management policy, signed by top executives, is the best way to ensure line compliance with safety programs.

### Training

The importance of training to a business firm or any other organization cannot be underestimated. Increased productivity, heightened morale, reduced supervision, reduced accidents, and



increased organizational stability are the major values of training. Training means increasing the knowledge and skill needed to do a particular job. The major burden for training falls upon the particular business organization. Education, on the other hand, increases general knowledge and understanding of the total environment. Both training and education help personnel develop the desired level of skill, knowledge and attitude (Simonds, 1973).

Training is a powerful influence and motivator in safety (NSC, 1977). An effective accident prevention and occupational health hazard control program is based on proper job performance. Safe job performance is encouraged by developing safe work procedures, by teaching the procedures effectively, and by insisting that they be followed (NSC, 1977). People trained to do their jobs properly will do them safely.

#### Accident Reporting and Recording

Record keeping is one of the most basic elements of an accident prevention program. Accident records are a primary way any company can measure the effectiveness of its accident prevention program. Records supply the necessary information to change haphazard, costly, and ineffective safety work into a planned safety program that controls the conditions and acts contributing to accidents. Good record keeping is the basis for a scientific approach to occupational safety (NSC, 1977).

Safety records provide information concerning how many accidents are occurring, where and how they happen, and their severity and cost.

These data help company managers estimate accident costs, compute accident frequency and severity rates, and identify the department and work activities where accidents occur. Accident data also help determine the causes of accidents so that corrective actions can be taken.

The responsible company executive should receive periodic summary reports on the safety program. These data will tell him where accidents occur in the plant operation and give him a method for evaluating the progress made in eliminating accidents (NSC, 1977). When an accident does happen, management should take the opportunity to learn from the mistake. The accident should be recorded, reported, and analyzed in all aspects: the person, the job on which the accident occurred, the tools and equipment involved, the particular act, the department in which it happened, and the manner in which the employee was injured (Flippo, 1976).

### Physical Surveys

A safe and healthy place to work is the foundation of every successful safety program. Therefore, controlling the physical environment and providing a safe work place should be conditions of organizing and administering every safety program. It is management's responsibility to make every effort to provide a safe work place (Anton, 1979).

A safe work place is important because most industrial injuries are caused by an unsafe physical condition and/or an unsafe act. The unsafe physical condition is often a product of the environment. Improving the environment can help eliminate the unsafe physical

condition and improve working conditions, leading to better production (Anton, 1979).

Inspections are one way to improve the environment. Inspection procedures have two basic objectives:

1. to maintain a safe working environment and control the unsafe actions of people, and,
2. to maintain operational profitability.  
(NSC, 1977, p. 71)

Top management holds the ultimate responsibility for inspecting the work place. The authority for carrying this out extends down through all levels (Anton, 1979). If inspection is used as a measurement tool, the line manager will inspect work areas more often to ensure safe conditions and fewer unsafe acts (Petersen, 1978). This means inspecting the physical environment for hazardous conditions and inspecting people for performing unsafe acts.

#### Medical Support

Occupational health programs are concerned with all aspects of a worker's health and his relationship with his environment. If an industrial worker is to perform his tasks safely and efficiently, he must be in good health. Any company, regardless of its size, should have some type of medical program (Flippo, 1976).

Occupational health services may range from a full-time staff of physicians, nurses, and technicians housed in a model dispensary to only a first-aid kit with an adequately trained person to render first aid (NSC, 1977). Whatever the scope of health service, every company

should maintain adequate provision to give prompt first-aid treatment in all cases of injury or illness.

Good administration of first-aid is an important part of every safety program. A careful record of first-aid should be kept and an injury investigation report should be sent to the injured person's supervisor when the first aid is administered (NSC, 1977). Small establishments that cannot economically hire a qualified medical professional can use a first-aid attendant who follows a doctor's prescribed procedures and treatments (NSC, 1977).

#### Motivation

Motivation is defined as the "skill in aligning employee and organizational interests so that behavior results in achievement of employee wants simultaneously with attainment of organizational objectives" (Flippo, 1976, p. 390).

Through its policies, management may decide that a safe performance from employees is desired. Management cannot, however, force a safe performance. Based on their knowledge, skills, and group attitude toward a problem, employees will decide for themselves whether they will work, how hard, and how safely (Petersen, 1978). Their attitudes toward themselves, their environment, management, and the company shape their decision. Therefore, it is necessary to motivate employees to perform their work safely and, if necessary, to persuade them to change an opinion, attitude or point of view.

An effective program of safety promotion must be persuasive; it must motivate employees to get involved in the safety activities.

Frederick Herzberg recommends motivating an employee by giving him the stimulus of challenging, responsible work. It follows that if a safety manager develops a safety program that is challenging and encourages employee responsibility, there is a good chance that the employee will do what the manager wants him to do--work safely (McHugh & Sutton, 1968).

Motivating workers to perform in a given way cannot be accomplished unless workers are supervised in the correct procedure. Managers seen promoting safety are an excellent example to employees. Also, training employees to work safely will encourage the safe working performance that management wants (Baldwin, 1976).

Management must provide a safety program that will attract and maintain all employees' interest and awareness. In the final analysis, management's goal is to reduce the injuries and the property damage due to unsafe acts. Barenklau (1976) suggested that management must set the example for employee's motivation as one of the best means of promoting safety. "Why should a worker be required to follow safety rules. . .that management people ignore" (p. 66).

#### SUMMARY

The review of the literature defined the purposes behind industrial safety and its benefits to society. Theories and the historical background of industrial safety were reviewed. The basic elements of safety programs were considered as the tool that management uses in sharing, fixing, and assigning responsibility and accountability for accident prevention. The impact of establishing

the occupational safety and health agency was of great significance in fostering an increased awareness of safety and health in employees and management and resulted in a decline of work accidents.

In conclusion, the review of literature indicated that management's commitment to safety is believed to be a major controlling influence in attaining success in industrial accident prevention. Open communication between workers, supervisors, and management; motivation of top, middle, and lower levels of the organization; and training of supervisors and workers are all considered to be of great significance. Overall, the nature of all these factors suggest that maximally effective safety programs in industry will be dependent on practices that can successfully deal with "people" variables.

### CHAPTER III DESIGN OF THE STUDY

This chapter provides background information regarding the study population, sample selection, development of the data collection instruments, and distribution and collection of the data. The chapter also provides background information regarding the content validation of the data collection instruments as well as treatment of the data.

#### POPULATIONS OF THE STUDY

The participants in this study were drawn from two populations. The first population consisted of 594 operational Saudi industrial organizations in the two cities of Jeddah and Riyadh. The second population consisted of 20 Saudi government officials in the administrative and educational branches of the government.

#### Survey Sample Selection

The population frame was identified from a 1980 published list of licensed industries by the Ministry of Industry and Electricity (Saudi Arabia Ministry of Industry and Electricity, 1980). This list included 254 operational factories in Jeddah and 340 operational factories in Riyadh which gave a total number of 594 factories in the two cities. The following procedures were followed:

1. The list was arranged in alphabetical order.
2. Nominal numbers were assigned to each industry.

3. The sample size was determined according to the following formula:

$$n = \frac{p(1-p)}{\left(\frac{e}{z}\right)^2 + \frac{p(1-p)}{N}}$$

where, n = sample size

N = population size

\* p = estimated sample response proportion

\*\* e = percent of accepted estimated error

\*\*\* z = confidence level (Clover & Balsley, 1979).

\* The estimated sample response proportion that was assumed in this case was that 50 percent of the responses will be in one direction and 50 percent will be in the opposite direction. This percentage was assumed due to lack of experience and statistics in the field of industrial safety. This assumption was statistically valid when such cases existed (Lesikar, 1977).

\*\* A ten percent maximum error was assumed.

\*\*\* A 95% confidence level was assumed.

4. The sample was selected randomly using a random number table.

5. Proportions of industries were chosen from Jeddah and Riyadh according to their relative proportions in the two cities. The total industries in these two cities were: (a) 254 (43%) factories in Jeddah, and (b) 340 (57%) in Riyadh.

Using the above formula the sample size was found to be:

$$n = \frac{(0.5)(0.5)}{\left(\frac{0.1}{1.96}\right)^2 + \frac{(0.5)(0.5)}{594}} = 84 \text{ factories}$$

This sample size corresponded to 14% of the total population. A



safety factor of 6% of the total population was assumed and added to the sample size. In other words, 20% of the total population was selected to make the sample size equal to 119 factories.

### Interview Sample Selection

The population of government officials was identified from field data collected in the summer of 1981, by this researcher, during a visit to Saudi Arabia. Twenty ministries, agencies, institutions, and organizations were identified as being involved, or thought to be involved, in occupational safety and health matters. The sample for the interview consisted of the entire identified population.

### DEVELOPMENT OF THE SURVEY AND INTERVIEW INSTRUMENTS

A questionnaire was developed to determine: (a) the status of industrial safety procedures, (b) the practices of management regarding safety, and (c) the extent of management acceptance of responsibility for industrial safety. The following elements are essential to an effective safety program regardless of the size of the organization (NSC, 1977):

1. Management leadership
2. Accountability and assignment of responsibility
3. Training
4. Accident reporting and recording
5. Physical survey
6. Medical support
7. Motivation

Contents of the questionnaires were created and compiled from industrial safety literature in the form of books, journal articles, Occupational Safety and Health Administration publications and circulars, National Safety Council publications and circulars, and safety manuals of a few American companies.

The questionnaire was designed and internally validated by the jury of experts to probe and sense the awareness and the extent of present industrial safety measures of Saudi Arabian industry. More specifically, the questions were designed to quantitatively evaluate the seven variables (elements) of industrial safety programs in the Saudi industry. The questionnaire was divided into nine categories which included the seven variables and two categories entitled "Background" and "General."

An interview schedule was developed to collect data and pertinent information from the appropriate officials of the government. The overall objectives of the interview were to determine the status of government activities and the extent of the government involvement, practice, and responsibility for industrial safety. The interview was internally validated by a jury of experts.

Contents of the interview schedule were drawn ~~and compiled~~ from the literature of industrial safety in the form of books, journal articles, Occupational Safety and Health Administration publications and circulars, the National Safety Council publications and circulars, and Saudi Government documents.

## CONTENT VALIDATION OF SURVEY AND INTERVIEW INSTRUMENTS

The content validity of the survey and interview instruments were assessed by a jury of experts. Both instruments were mailed to a jury of six experts in the field of industrial safety. Five replied and these replies validated the contents of both instruments with minor changes. Revision of the survey and interview instruments was made according to the experts' recommendations. The panel of experts was composed of the following:

1. Rocco Barbuto  
Manager, Occupational Safety and Health  
Missile Systems Division  
Raytheon Company  
Andover, Massachusetts
2. Richard H. Niedert  
Safety Department Manager  
John Deere Component Works  
Waterloo, Iowa
3. Daniel L. Wu, Ph.D., C.I.H.  
Staff Consultant  
National Safety Council  
Chicago, Illinois
4. Claude J. Bresson  
Project Manager  
Manufacturing Engineering Services  
John Deere Component Works  
Waterloo, Iowa
5. Richard Merrow  
Director, Occupational Safety and Health  
Executive Affairs  
Raytheon Company  
Lexington, Massachusetts
6. Gene P. Grillo, Ph.D.  
Consultant, Environmental Health Engineering  
Western Electric Company and,  
Adjunct Professor  
Environmental Health Sciences  
Boston University

## PREPARATION, DISTRIBUTION AND COLLECTION OF THE QUESTIONNAIRE

The following activities were followed:

1. The validated questionnaire was first approved by the researcher's advisory committee.
2. An introduction that explained the purpose of the survey and procedures for completing the questionnaire was prepared and then approved by the advisory committee.
3. Since this researcher was employed by the Saudi Air Defense, an introductory cover letter from the Saudi Air Defense Projects and Planning Directorate was also attached to the questionnaire, as was customary. The purpose of the letter of introduction was to promote the cooperation of each individual industry in completing the survey questionnaire. The content of the cover letter was approved by the advisory committee and is shown in Appendix A.
4. A copy of the questionnaire, its purpose and answering instructions, and the introductory cover letter was sent to the Graduate School of the University of Northern Iowa along with the required form for clearance and was approved by the Human Subjects Review Board.
5. The questionnaire and its introduction was translated into Arabic by two professional translators.
6. The two translators were selected by this researcher for the purpose of obtaining a translated questionnaire that had the same content validity as the English version and that was free from any semantic or syntax errors.

7. The content of the questionnaire is shown in Appendix A; however, the actual instrument was a single 25½" x 11" sheet of paper for the Arabic as well as the English version.

8. A copy of the Arabic and English questionnaire was delivered personally by the researcher to each individual industry in both Jeddah and Riyadh. This was done due to time limitation and to assure higher response returns in the time allowed.

9. A period of one to two weeks was given each industry for completing the questionnaire.

10. The researcher personally collected the questionnaires from the individual industries. All questionnaires were reviewed before leaving each industry to verify that all questions were answered or to determine if the particular industry needed more clarification in order to complete unanswered questions.

11. The great majority of the respondents responded in Arabic. The responses were translated into English by the researcher.

12. Facsimiles of the questionnaire in both English and Arabic are shown in Appendix A.

#### THE INTERVIEW SESSION

The following activities were followed:

1. A letter of introduction explaining the purpose of the interview was generated. The letter was signed by either the General Chief of Staff of the Ministry of Defense and Aviation or the Air Defense Projects and Planning Director. The individual whose signature appeared on the letter was dependent on the title and

position of the officials concerned. It was customary that such a letter be generated by the employment agency of the researcher. The purpose of this letter of introduction was to promote the cooperation of government officials in conducting and completing the interview.

2. A copy of the letter of introduction was presented to and approved by the researcher's advisory committee.

3. A copy of the interview schedule and the interview letter of introduction was sent to the Graduate School of the University of Northern Iowa along with the required form for clearance and was approved by the Human Subjects Review Board.

4. The interview schedule and the introduction letter were translated into Arabic by two professional translators. Two translators were selected by this researcher for the purpose of obtaining a translated version that had the same content validity as the English version and that was free from any semantic or syntax errors.

5. The interview was conducted in Arabic. The responses to the interview were translated into English by the researcher.

6. Copies of the interview schedule and the letter of introduction are shown in both languages in Appendix B.

The interview was conducted with the appropriate officials of the following government Ministries, Agencies, Institutions, and Organizations:

1. The Central Inspection Department of the Ministry of Labor and Social Welfare.

2. The Occupational Health Division of the Ministry of Health.

3. The Central Industrial Security Organization of the Ministry of Interior.

4. The Civil Defense Department of the Ministry of Interior.

5. Deputyship for Supply Affairs of the Ministry of Commerce.

6. Foreign Capital Investment Organization of the Ministry of Industry and Electricity for Industrial Affairs.

7. The Research Division and Technical Audit for Companies of the Ministry of Industry and Electricity for Electrical Affairs.

8. The Standards Division of the Standards and Measurements Organization.

9. Vocational Training Department of the General Directorate of Technical Education and Vocational Training.

10. Vocational Trainers and Visual Vocational Aids Center Institute of the General Directorate of Technical Education and Vocational Training in Riyadh.

11. The Royal Technical Institute of the General Directorate of Technical Education and Vocational Training in Riyadh.

12. The Higher Technical Institute of the General Directorate of Technical Education and Vocational Training in Riyadh.

13. The Ideal Industrial Institute of the General Directorate of Technical Education and Vocational Training in Jeddah.

14. Riyadh Vocational Training Center of the General Directorate of Technical Education and Vocational Training.

15. Jeddah Vocational Training Center of the General Directorate of Technical Education and Vocational Training.

16. Research and Development and Business Administration Department of the College of Economics and Management of King Abdulaziz University in Jeddah.

17. Academic and Students' Affairs Department of the College of Engineering of King Abdulaziz University in Jeddah.

18. The College of Management Sciences of King Saud University in Riyadh.

19. The College of Engineering of King Saud University in Riyadh.

20. The Department of Projects of the Saudi Basic Industries Corporation.

#### SURVEY QUESTIONNAIRE RETURN

A great deal of effort was put into the assurance of a high percentage return of the survey questionnaire. These efforts included personal deliveries by the researcher to 51 industrial organizations in Jeddah and 68 in Riyadh. In addition to the cover letter from the Air Defense Projects and Planning Directorate that urged industries' cooperation and the introduction to the questionnaire that assured their anonymity, this researcher stressed verbally with each industry the importance of the research for industry itself and the Saudi society. Follow-up telephone calls and frequent trips were made urging a response.

Returns of the questionnaire were collected personally by the researcher. A return of 46 questionnaires in Jeddah and 57 in Riyadh was obtained. The total rate of return was 86.6%.



## TREATMENT OF THE DATA

The returned survey questionnaires were given to the Air Defense Command Computer Center in Jeddah, Saudi Arabia. The questionnaires were coded and placed on computer tape. Frequencies, percentages, means, and standard deviations were computed. Subjective questions were grouped and summary statistics were calculated. The researcher analyzed and summarized the interview data. Summary statistics were calculated manually by the researcher due to the small number and subjectivity of the questions. Tables were constructed for statistical presentation. These tables are shown in Chapter IV.

CHAPTER IV  
FINDINGS, ANALYSES AND INTERPRETATIONS OF THE DATA

This chapter contains the presentations, analyses and interpretations of the data compiled from the survey and interview instruments. The chapter is composed of two parts: (a) findings, and (b) analyses and interpretations of the major findings.

FINDINGS

One hundred and three returns (86.6%) from the survey instrument are reported under nine headings:

1. Organization's Background
2. Management Leadership
3. Accountability and Assignment of Responsibility
4. Training
5. Accident Reporting and Recording
6. Medical Support
7. Physical Survey
8. Motivation
9. General Support Information

Interviews with 20 government officials were conducted. Tabulation and groupings of their responses are reported under three headings:

1. Responses to Questions Common to Both Officials in the Administrative and Educational Branches of the Government.

2. Responses to Questions Common Only to Officials of the Administrative Branches of the Government.

3. Responses to Questions Common Only to Officials of the Educational Branches of the Government.

### The Survey

#### Organization's Background

Question number one asked the respondents to identify their major industrial operation. Industrial operations were identified as: manufacturing, distribution, service, and construction. Each of these operations had ten categories. These categories were identified as: mechanical, electrical, chemical, metal work, wood work, paper products, petrochemical, food products, cement products, and other.

The data in Table 1 showed that 77 organizations or 74.76% were in manufacturing only, 22 or 21.36% were in manufacturing and distribution, 2 or 1.94% in manufacturing and service, and 2 or 1.94% were in manufacturing, distribution, and service. The data in this table indicated that the great majority of organizations surveyed were involved only in one function, i.e., manufacturing. Less than one-third of the organizations surveyed were involved in two or more types of operation. Less than 2% were involved in manufacturing and service, and in manufacturing, distribution and service. A very small minority, only 3.88% of the total surveyed, included service with manufacturing.

Table 1  
Types of Industrial Operations

Responses	Manufac- turing	Distri- bution	Service	Construc- tion	Mfg./ Dist. Serv.	Mfg./ Dist. Serv.	Mfg./Dist./ Serv.	Total	Percent
Mechanical	3.18					1		4.18	4.06
Electrical	4.18				0.33			4.51	4.38
Chemical	10.35				0.33			10.68	10.37
Metal work	31.52			2	0.33			33.85	32.86
Wood work	.59						.59		.57
Paper products	1.59			1	1			3.59	3.49
Petrochemical	8.59			7				15.59	15.14
Food products	4			6				10	9.71
Cement products	3			4				7	6.80
Furniture	1			1				1	.97
Building material	1							1	.97
Textiles	1							1	.97

Table 1 (continued)

Responses	Manufac- turing	Distri- bution	Service	Construc- tion	Mfg./ Dist.	Mfg./ Serv.	Mfg./Dist./ Serv.	Total	Percent
Leather	1					1		2	1.94
Brushes	1							1	.97
Tires-re-cap	1							1	.97
Glass	1							1	.97
Gypsum	1							1	.97
Castings	1							1	.97
Clay	1				1			2	1.94
Marble machining	1							1	.97
Total	77				22	2		103	
Percent	74.76				21.36	1.94			100.00

Table 2  
Number of Workers in Organization

Number of workers in organization	Number of organizations	Percent
10-49	38	36.89
50-99	30	29.13
100-249	21	20.39
250-Up	<u>14</u>	<u>13.59</u>
Total	103	100.00

The data in Table 2 showed the response to the request of providing the total number of workers at each location. The results indicated that 36.89% of the sample surveyed had less than 50 employees, 66.02% had less than 100 employees, 86.41% had less than 250 employees, and 13.59% had over 250 employees working in their organizations.

The data in Table 3 showed the response to the request to provide the title of the person answering the survey. The responses were grouped into 11 categories as shown and they indicated that 66.01% of the surveys were answered by either plant/general manager, production/technical manager or owner/manager while 25.25% were answered by either the accountant, personnel manager, or the administrative manager. Only three were answered by a safety officer, one by plant physician, and one by the training officer. The remaining 3.88% were answered by either the economic advisor or store keeper/foreman.

Table 3  
Position Title of Persons  
Answering the Survey

Position title	Number of organizations	Percent
Plant/general manager	48	46.60
Production/technical manager	16	15.53
Accountant	12	11.65
Administrative manager	11	10.68
Owner/manager	4	3.88
Personnel manager	3	2.92
Safety officer/supervisor	3	2.92
Economic advisor	2	1.94
Store keeper/foreman	2	1.94
Plant physician	1	.97
Training officer	<u>1</u>	<u>.97</u>
Total	103	100.00

#### Management Leadership

The data in Table 4 showed the response to the question: Is industrial safety considered to be one of the objectives of your organization? The results indicated that 91.26% of the sample surveyed considered industrial safety to be one of their organizational objectives while 8.74% did not.

Table 4  
 Consideration of Industrial Safety as an  
 Organizational Objective

Response	Number	Percent
Considered	94	91.26
Not considered	<u>9</u>	<u>8.74</u>
Total	103	100.00

The data in Table 5 showed the response to the question: Does your organization have a written safety policy? The results indicated that 25.24% of the sample surveyed had a written safety policy while 74.76% did not.

Table 5  
 Availability of Written Safety Policy

Response	Number	Percent
Available	26	25.24
Not available	<u>77</u>	<u>74.76</u>
Total	103	100.00

The data in Table 6 showed the response to the question: Does your organization have a safety department? The results indicated that 94.17% of the sample surveyed did not have a safety department and only 5.83% did have a safety department. Of those who indicated



the absence of a safety department, 80.41% have assigned the responsibility of accident prevention to someone in the management or supervisory levels as shown in Table 7, and 19.59% did not assign it to anyone. Those who assigned accident prevention responsibilities to someone in the management or supervisory levels were asked if this assignment was full- or part-time.

Table 6  
Existence of Safety Department

Response	Number	Percent
Exists	6	5.83
Does not exist	<u>97</u>	<u>94.17</u>
Total	103	100.00

Table 7  
Assignment of Accident Prevention to  
Management or Supervisory Levels

Response	Number	Percent
Assigned	78	80.41
Not assigned	<u>19</u>	<u>19.59</u>
Total	97	100.00

Table 8  
Full-time vs. Part-time Assignment of Responsibility  
for Accident Prevention

Response	Number	Percent
Full-time	13	16.67
Part-time	<u>65</u>	<u>83.33</u>
Total	78	100.00

The data in Table 8 showed that 83.33% of the organizations who assigned accident prevention responsibilities to someone in the management or supervisory levels assigned it as a part-time activity, while 16.67% assigned it as a full-time activity. Those who assigned the responsibility as a part-time activity of another job were asked to indicate what percentage of time was spent on safety.

The data in Table 9 showed that 60% of those organizations who assigned accident prevention as a part of some manager's or supervisor's responsibility assigned it as 10% or less, 12.31% of the organizations as 20%, 15.38% as 30%, and 12.31% as 40% or 50%.

Table 9

Assignment of Responsibility for Accident Prevention as a  
Part-time Activity of Someone's Job

Assignment percent	Number	Percent of total number
50	6	9.23
40	2	3.08
30	10	15.38
20	8	12.31
10	25	38.46
5	11	16.92
2	1	1.54
1	<u>2</u>	<u>3.08</u>
Total	65	100.00

The data in Table 10 showed the answer to the question: What level(s) of management is/are responsible and accountable for safety in your organization? Only the 84 respondents who responded to this question were listed in Table 10. The data showed that 32.14% of the sample had top management and other lower levels responsible and accountable for safety, and 44.05% had middle management and other lower levels responsible and accountable. The data also showed that the supervisory level was responsible and accountable for safety in 17.86% of the organizations surveyed. Very few have assigned it to only the foreman level--5.95% of the organizations.

Table 10  
Levels of Management Responsible  
and Accountable for Safety

Response	Number	Percent
a) Top management	20	23.81
b) Middle management	33	39.29
c) Supervisory level	15	17.86
d) Foreman	5	5.95
a, b, c and d	4	4.76
a, c and d	1	1.19
a and d	2	2.38
b and c	1	1.19
b, c and d	<u>3</u>	<u>3.57</u>
Total	84	100.00

Table 11  
Defining Accident Prevention Responsibilities  
in Writing

Response	Number	Percent
Defined in writing	28	27.18
Not defined in writing	<u>75</u>	<u>72.82</u>
Total	103	100.00

The data in Table 11 showed the answer to the question: Are the accident prevention responsibilities in your organization defined in writing? The results indicated that 72.82% of the sample surveyed have not defined accident prevention responsibilities in writing, while 27.18% had.

Table 12  
Frequency of Safety Meetings with Employees

Response	Number	Percent
Never	52	50.49
Four times/year	10	9.71
Three times/year	4	3.88
Twice/year	7	6.80
Once/year	1	.97
Twice/month	4	3.88
Once/month	10	9.71
Once/week	6	5.83
Other: When needed	7	6.79
Constantly	<u>2</u>	<u>1.94</u>
Total	103	100.00

The data in Table 12 showed the answer to the question: How often are safety meetings by management or supervisors held with personnel they directly supervise? The results indicated that 50.49% of the managers or supervisors of the sample surveyed have never conducted

safety meetings with employees they directly supervise, while 49.51% conducted those meetings with the frequency shown.

The data in Table 13 showed the answer to the question: To what extent are you aware of your organization's accident record? The results indicated that 50.49% of the sample surveyed kept no records of any kind while 29.12% had some type of records for the organization or department. Only 20.39% of the sample had detailed records for each department.

Table 13  
Extent of Awareness of Organization's Accident Records

Response	Number	Percent
Have no records	52	50.49
Have some records for the organization	28	27.18
Have some records for some departments	2	1.94
Have detailed records for each department	<u>21</u>	<u>20.39</u>
Total	103	100.00

The data in Table 14 showed the answer to the question: How often do you prepare or have you prepared an accident analysis of your organization for your superior? The results indicated that 70.87% of the sample surveyed had never prepared an accident analysis report of any kind, while 29.13% of the organizations did prepare an accident analysis report in the frequencies shown.

Table 14  
Accident Analysis Preparation by or  
for Management

Response	Number	Percent
Never	73	70.87
Four times/year	3	2.91
Three times/year	2	1.94
Twice/year	2	1.94
Once/year	9	8.74
Once/month	7	6.80
Other: When required	<u>7</u>	<u>6.80</u>
Total	103	100.00

The data in Table 15 showed the answer to the question: Who has a set of safety rules and/or safety procedures in your organization? The results indicated that 59.22% of the sample surveyed did not provide safety rules and/or procedures to the different levels of their organization, while 14.56% of the organizations provided safety rules and/or procedures to all supervisors, 8.74% to all middle managers, 6.80% to all foremen, 5.83% to all middle managers and all supervisors, and 4.85% to a mixture of the levels shown in the table.

Table 15  
Availability of Safety Rules and Procedures at  
Different Levels of Organization

Response	Number	Percent
a) No one	61	59.22
b) All middle managers	9	8.74
c) All supervisors	15	14.56
d) All foremen	7	6.80
e) All workers	1	.97
b and c	6	5.83
b, c and d	1	.97
b and d	1	.97
c and d	1	.97
c, d and e	<u>1</u>	<u>.97</u>
Total	103	100.00

The data in Table 16 showed the answers to the question: In your organization, what type of injury occurs most frequently? (Mark only the three most frequent). 1 = highest frequency; 2 = second highest; 3 = third highest. The results indicated that cut, laceration, puncture, and abrasion were checked as the type of injury that occurred most by 50.49% of the sample surveyed; bruise and contusion as the second highest 29.13%; and cut, laceration, puncture and abrasion again as the third highest. Eight organizations did not respond to the question.



Table 16  
Frequency and Percent of Occurrence for the  
Three Most Frequent Types of Injuries

Types of injury	Frequency					
	Highest	Percent	Second highest	Percent	Third highest	Percent
Amputation	6	5.83	1	.97	8	7.77
Burns and heat	8	7.77	17	16.50	7	6.80
Chemical burn	5	4.85	4	3.88	3	2.91
Concussion						
Crushing injury			6	5.83	4	3.88
Cut, laceration, puncture, abrasion	52	50.49	18	17.48	13	12.62
Bruise, contusion	16	15.53	30	29.13	11	10.68
Occupational illness	3	2.91	4	3.88	6	5.83
Sprain, strain	1	.97	5	4.85	11	10.68
Fracture	2	1.94	7	6.80	5	4.85
Hernia					2	1.94
Other	2	1.94	1	.97	2	1.94
No answer	8	7.77				

The data in Table 17 showed the answers to the question: Of all the above injuries which has the greatest severity regardless of frequency? The results indicated that 33.98% of the sample surveyed responded that cuts, lacerations, punctures, and abrasions were more severe than the other injuries; 17.48% reported amputations were

severest, while burns and heat, bruises and contusions, and fractures ranked third through sixth in severity with 9.71% and 8.74%, 8.74%, and 6.80% respectively.

Table 17  
Severity of Injuries

Types of injuries	Number	Percent
Amputation	18	17.48
Burns and heat	10	9.71
Chemical burn	9	8.74
Concussion	1	.97
Crushing injury	3	2.91
Cut, laceration, puncture, abrasion	35	33.98
Bruise, contusion	9	8.74
Occupational illness	1	.97
Sprain, strain	1	.97
Fracture	7	6.80
Hernia	0	00
None	<u>9</u>	<u>8.74</u>
Total	103	100.00

#### Accountability and Assignment of Responsibility

The data in Table 18 showed the answer to the question: In which of the following manner does your company assign accident prevention responsibilities? The results indicated that 41.75% of the sample

surveyed assigned accident prevention responsibility verbally, 28.16% assigned it written and verbal, and 12.62% assigned it in written form. The results also indicated that 17.48% of organizations surveyed did not assign accident prevention responsibilities at all.

Table 18  
Manner of Assigning Accident Prevention Responsibilities

Response	Number	Percent
Written	13	12.62
Verbal	43	41.75
Written and verbal	29	28.16
None	<u>18</u>	<u>17.48</u>
Total	103	100.00

The data in Table 19 showed the answer to the question: In which way do you verify that the supervisors understand their accident prevention responsibilities? The results indicated that 50.49% of the sample surveyed relied on oral feedback from supervisors as means of verification that the supervisors understood their accident prevention responsibilities. The results also indicated that 19.42% relied on supervisors rating from the superior as means of verification, while 26.21% did not rely on any form of verification. Only 3.88% indicated that they depended on other means of verification as shown in the table.

Table 19  
Verification of Assignment of Accident  
Prevention Responsibilities

Response	Number	Percent
Do not verify	27	26.21
Oral feedback from supervisors	52	50.49
Supervisor's rating from superior	20	19.42
Other: No accidents	2	1.94
By reports	1	.97
Constant inspection	<u>1</u>	<u>.97</u>
Total	103	100.00

The data in Table 20 showed the response to the question: Are supervisors counseled on their safety performance? The results indicated that 45.63% of the sample surveyed counseled their supervisors on safety performance while 54.37% did not.

Table 20  
Supervisor's Safety Performance Counseled by Management

Response	Number	Percent
Counseled	47	45.63
Not counseled	<u>56</u>	<u>54.37</u>
Total	103	100.00

The data in Table 21 showed the response to the question: Is there any follow-up with supervisors who have the poorest departmental safety performance? The results indicated that 47.57% of the sample surveyed did make a follow-up with supervisors who have the poorest safety performance, while 52.43% did not.

Table 21  
Follow-up of Supervisor's Safety Performance by Management

Response	Number	Percent
Followed-up	49	47.57
Did not follow-up	<u>54</u>	<u>52.43</u>
Total	103	100.00

Table 22  
Supervisor's Safety Performance Recognized  
by Management

Response	Number	Percent
Recognition given	34	33.01
Recognition not given	<u>69</u>	<u>66.99</u>
Total	103	100.00

The data in Table 22 showed the response to the question: Is there recognition given to supervisors with good safety performance? The results indicated that 66.99% of the sample surveyed did not give

recognition to supervisors with good safety performance. Only 33.01% of the organizations surveyed did give some form of recognition.

Table 23

## Inclusion of Supervisor's Safety Record in Performance Review

Response	Number	Percent
Included	32	31.07
Not included	<u>71</u>	<u>68.93</u>
Total	103	100.00

The data in Table 23 showed the response to the question: Is the supervisor's safety record included for consideration in his performance review? The results indicated that 68.93% of the sample surveyed did not include the supervisor's safety record for consideration in their performance reviews. Only 31.07% of the organizations surveyed did include the supervisor's record for consideration in their performance reviews.

Table 24

Assessment of Supervisor's Safety Attitude/  
Performance Regarding Safety

Response	Number	Percent
Assessed	46	44.66
Not assessed	<u>57</u>	<u>55.34</u>
Total	103	100.00

The data in Table 24 showed the response to the question: Do you assess the supervisor's safety attitudes/performance regarding safety? The results indicated that 55.34% of the sample surveyed did not assess the supervisor's safety attitudes/performance, but 44.66% did.

Table 25

Title of Person Responsible for Enforcement  
of Safety Rules and Regulations

Response	Number	Percent
Production manager	22	21.36
Plant manager	20	19.42
Tech supervisor	15	14.56
Foreman	12	11.65
Safety officer/supervisor	10	9.71
General manager	6	5.83
Administrative manager	5	4.85
Maintenance manager	2	1.94
No one	<u>11</u>	<u>10.68</u>
Total	103	100.00

The data in Table 25 showed the response to the question: Who enforces safety rules and regulations within the plant area? The results indicated that 66.99% of the sample surveyed had the safety rules and regulations enforced by either the production manager, plant manager, technical supervisor or foreman. Only 9.71% of the organizations surveyed had the safety rules and regulations enforced

by a safety officer/supervisor. General managers, or administrative managers enforced safety rules and regulations within the plant area in 10.68% of the organizations surveyed while 10.68% of the sample had no one to enforce safety rules and regulations within the plant area.

Table 26

Management's Actions Regarding Supervisor's Failure to  
Correct an Unsafe Practice

Response	Number	Percent
Nothing	12	11.65
Verbal warning	65	63.11
Written warning	20	19.42
Other: Discussions	5	4.85
Reminding	<u>1</u>	<u>.97</u>
Total	103	100.00

The data in Table 26 showed the response to the question: What do you do if you observe a supervisor failing to correct an unsafe practice? The results indicated that 63.11% of the sample surveyed gave verbal warning to supervisors failing to correct an unsafe practice while 19.42% of the organizations gave a written warning. The results also indicated that 11.65% of the organizations did nothing to those supervisors who failed in correcting an unsafe practice. Five out of six organizations mentioned discussions with supervisors while the sixth mentioned only reminding the supervisors.



The data in Table 27 showed the response to the question: Do you encourage receiving safety recommendations from employees? The results indicated that 92.23% of sample surveyed encouraged receiving safety recommendations from employees while 7.77% did not. Those who encouraged receiving recommendations were asked the following question: From which group of employees do most safety recommendations come? The data in Table 28 showed that 36.84% of the sample surveyed received recommendations from supervisors/foremen, 20% from all workers, 14.74% from production, 6.32% from maintenance, and 6.32% from workers in paint, welding, furnace, and packaging. The data also showed that 4.21% received recommendations from no one in their organization while 6.32% of the organizations did not answer the question.

Table 27  
Encouragement Given to Receive Safety  
Recommendations from Employees

Response	Number	Percent
Encouraged	95	92.23
Not encouraged	<u>8</u>	<u>7.77</u>
Total	103	100.00

Table 28  
Source of Safety Recommendations

Response	Number	Percent
Supervisors/foremen	35	36.84
All workers	19	20.00
Production	14	14.74
Maintenance	6	6.32
Management/administration	5	5.26
Paint, welding, furnace, packaging	6	6.32
None	4	4.21
No answer	<u>6</u>	<u>6.32</u>
Total	95	100.00

### Training

The data in Table 29 showed the response to the question: Have your supervisors been trained in accident prevention techniques? The results indicated that 64.08% of the supervisors of the sample surveyed were not trained in accident prevention techniques while 35.92% were trained.

Table 29  
Training of Supervisors in Accident  
Prevention Techniques

Response	Number	Percent
Trained	37	35.92
Not trained	<u>66</u>	<u>64.08</u>
Total	103	100.00

Table 30  
Safety Training Requirements for Supervisors

Response	Number	Percent
Required	22	21.36
Not required	<u>81</u>	<u>78.64</u>
Total	103	100.00

The data in Table 30 showed the response to the question: Does your organization require that your supervisors attend safety training courses? The results indicated that 78.64% of the sample surveyed did not require that their supervisors attend safety training courses, while 21.36% of the organizations did. Those who required supervisors to attend safety training were asked the following question: Are these safety training courses offered in your organization? The data in Table 31 showed their responses.

Table 31  
Safety Training Offered in the Organization

Response	Number	Percent
Training offered	6	27.27
Training not offered	15	68.18
No answer	<u>1</u>	<u>4.55</u>
Total	22	100.00

Of those 22 organizations that required their supervisors to attend safety training courses, only 27.27% offered these courses in their organization while 68.18% did not. One organization did not respond to the question.

Table 32  
Non-Industrial Safety Training Sources

Response	Number	Percent
Local schools	0	0
Government training centers	3	20.00
Other: None available	<u>12</u>	<u>80.00</u>
Total	15	100.00

Those who did not offer training were asked to answer the following question: Where do your supervisors attend safety training? Their responses, in Table 32, indicated that of the 15 organizations

that did not offer training courses in their organization, 80% indicated no schools outside their organizations were available. Only three organizations indicated that their supervisors attend government training centers for their safety training.

Table 33  
Provision of Accident Prevention  
Training for New Employees

Response	Number	Percent
Provided	53	51.46
Not provided	<u>50</u>	<u>48.54</u>
Total	103	100.00

The data in Table 33 showed the response to the question: Do new employees receive accident prevention training? The results indicated that 51.46% of the sample surveyed provided accident prevention training for new employees while 48.54% did not provide such training. Those organizations which provided accident prevention training for new employees were asked to identify the title of the position for the individual who conducts the accident prevention training. Their responses are shown in Table 34.

The data in Table 34 showed that 58.49% of those organizations that provide safety training for new employees reported that supervisors and foremen conducted accident prevention training for new employees. Training was conducted by plant managers for 15.09% of the organizations, by fellow workers in 3.77%, and by a training

officer in one organization. Only 13.21% of those who provide safety training to new employees had safety supervisors performing the activity of safety training. The data indicated that four organizations did not respond to the question.

Table 34

Position Title of the Individual who Conducts  
the Accident Prevention Training

Response	Number	Percent
Supervisors	20	37.74
Foremen	11	20.75
Plant manager	8	15.09
Safety supervisor	7	13.21
Fellow workers	2	3.77
Training officer	1	1.89
No answer	<u>4</u>	<u>7.55</u>
Total	53	100.00

Those organizations who provided accident prevention training were asked again to identify the type of the training. Their responses are shown in Table 35.

The data in Table 35 showed that 71.70% of those organizations who provided accident prevention training provided it on the job; 7.55% at breaks; 3.77% in formal settings; 3.77% on the job and at breaks; 1.89% on the job, at breaks and in formal setting; 5.66% on

the job and in formal setting. Only one organization provided accident prevention training in formal settings with written material provided. Two organizations did not respond to the question.

Table 35  
Forms of Safety Training

Response	Number	Percent
1) On the job	38	71.70
2) At breaks	4	7.55
3) In formal setting in plant	2	3.77
4) Written material given	0	.00
5) Other	0	.00
1 and 2	2	3.77
1, 2 and 3	1	1.89
1 and 3	3	5.66
3 and 4	1	1.89
No answer	<u>2</u>	<u>3.77</u>
Total	53	100.00

The data in Table 36 showed the answer to the question: Does the new employee's supervisor follow up initial orientation training with a discussion of rules and procedures and safe work practices? The results showed that 61.17% of the sample surveyed indicated their supervisors included discussions of rules and procedures of safe work

practices in initial orientation training for new employees while 38.83% did not.

Table 36  
Inclusion of Safety Rules and Procedures in  
Initial Orientation for New Employees

Response	Number	Percent
Included	63	61.17
Not included	<u>40</u>	<u>38.83</u>
Total	103	100.00

The data in Table 37 showed the response to the question: Have written job descriptions been prepared? The results indicated that 61.17% of the sample surveyed had not prepared job descriptions while 37.86% had; one organization did not respond to the question.

Table 37  
Existence of Written Job Description

Response	Number	Percent
Exists	39	37.86
Does not exist	63	61.17
No answer	<u>1</u>	<u>.97</u>
Total	103	100.00



Those organizations who prepared written job descriptions were asked the following question: Do these job descriptions include safe work practices and a list of personal protective equipment? Their responses are shown in Table 38. The results indicated that 51.28% of those organizations who had prepared job descriptions had included in it safe work practices and protective equipment list while 46.15% did not; one organization did not respond to the question.

Table 38

Inclusion of Safe Work Practices and Personal Protective  
Equipment List in Job Descriptions

Response	Number	Percent
Included	20	51.28
Not included	18	46.15
No answer	<u>1</u>	<u>2.56</u>
Total	39	100.00

The data in Table 39 showed the response to the question: Does your organization provide personal protective equipment? The results indicated that 95.15% of sample surveyed provided personal protective equipment to workers while 4.85% did not. Those who provided personal protective equipment were asked the following question: Which of the following personal protective equipment is provided? The data in Table 40 showed that all the 98 organizations provided personal protective equipment to their workers; goggles were provided by 88.78%

of the organizations, welding helmets and respirators or masks by 72.45%, welding hand shields and face shields by 66.33%, safety shoes by 46.94%, ear muffs by 37.76%, safety helmets by 33.67%, and hand gloves by 16.33%.

Table 39  
Provision of Personal Protective Equipment

Response	Number	Percent
Provided	98	95.15
Not provided	<u>5</u>	<u>4.85</u>
Total	103	100.00

Respondents that provided personal protective equipment were also asked the following question: Does the organization enforce the use of safety equipment? Their responses are shown in Table 41. The results indicated that 89.80% of those organizations who provided personal protective equipment did enforce their use while 9.18% did not. The data also showed that one organization did not respond to the question.

Those who provided personal protective equipment were again asked to answer the following question: Does the organization have a program for maintaining safety equipment? Their response is presented in Table 42. The results indicated that 47.96% of those organizations who provided personal protective equipment did have a program for their maintenance while 50% did not have a program, and 2.04% did not respond to the question.

Table 40

Types of Personal Protective Equipment Provided  
to Workers in 98 Organizations

Response	Number	Percent
Ear muffs	37	37.76
Welding helmets	71	72.45
Welding hand shields	65	66.33
Face shields	65	66.33
Goggles	87	88.78
Respirators or masks	71	72.45
Safety belts	14	14.29
Safety shoes	46	46.94
Safety helmets	33	33.67
Other: Hand gloves	16	16.33

Table 41

## Organizations Enforcing Safety Equipment Use

Response	Number	Percent
Enforced	88	89.80
Not enforced	9	9.18
No answer	<u>1</u>	<u>1.02</u>
Total	98	100.00

Table 42  
Availability of Maintenance Program for Safety Equipment

Response	Number	Percent
Available	47	47.96
Not available	49	50.00
No answer	<u>2</u>	<u>2.04</u>
Total	98	100.00

The data in Table 43 showed the response to the question: Does each supervisor have a list of the unsafe practices/conditions that apply to each job? The results showed that 74.76% of the sample surveyed indicated that their supervisors did not have a list of unsafe practices/conditions that apply to each job, while 25.24% of the organizations' supervisors did have such a list.

Table 43  
Supervisory Availability of Job's Unsafe Practices/Conditions

Response	Number	Percent
Available	26	25.24
Not available	<u>77</u>	<u>74.76</u>
Total	103	100.00

The data in Table 44 showed the response to the question: Have your employees been instructed in occupational hygiene? The results

indicated that 75.73% of the sample surveyed had not had their employees instructed in occupational hygiene while 24.27% had.

Table 44

## Employees Instructed in Occupational Hygiene

Response	Number	Percent
Employees instructed	25	24.27
Employees not instructed	<u>78</u>	<u>75.73</u>
Total	103	100.00

Table 45

## Percentage of Safety Training Cost in Respect to Total Training Costs

Response	Number	Percent
Less than 5%	57	55.34
5-10%	5	4.85
10-20%	2	1.94
20-30%	0	.00
More than 30%	0	.00
Other: Zero	<u>39</u>	<u>37.86</u>
Total	103	100.00

The data in Table 45 showed the response to the question:  
Approximately what percent of your training cost is allocated to

safety training? The results indicated that 55.34% of the sample surveyed allocated 5% or less of their training costs to safety training, and 37.86% allocated none. The data also showed that 4.85% of the sample allocated 5-10% of their training costs to safety training, and 1.94% allocated 10-20%. None of the sample surveyed allocated more than 20% of their training costs to safety training.

#### Accident Reporting and Recording

The data in Table 46 showed the response to the question: Do you maintain records on work related: (a) injuries/illness, (b) lost work time, and (c) accident costs? The results indicated that 69.90%

Table 46

Types of Records Maintained on Work-Related Injuries, Illnesses, Lost Work Time and Accident Costs

Record on work-related	Response	Number	Percent
Injuries/illness	Yes	31	30.10
	No	<u>72</u>	<u>69.90</u>
	Total	103	100.00
Lost work time	Yes	19	18.45
	No	<u>84</u>	<u>81.55</u>
	Total	103	100.00
Accident costs	Yes	21	20.39
	No	<u>82</u>	<u>79.61</u>
	Total	103	100.00

of the sample surveyed did not keep records on work-related injuries/illness while 30.10% did. In addition 81.55% of the organizations did not keep records on lost work time while 18.45% did. Finally, the data showed that 79.61% of the sample surveyed did not keep records on accident costs while 20.39% did.

Table 47  
Frequency of Injury Summary Reports From  
Supervisors to Management

Response	Number	Percent
Never	64	62.14
Three times/year	2	1.94
Twice/year	3	2.91
Once/year	4	3.88
Once/month	11	10.68
Once/week	1	.97
Others: When accident happened	<u>18</u>	<u>17.48</u>
Total	103	100.00

The data in Table 47 showed the response to the question: How often are injury summary reports provided by supervisors to management? The results indicated that for 62.14% of the sample surveyed supervisors did not provide management with injury summary reports, while 37.86% of the organizations' management received injury

summary reports from supervisors in the frequencies shown in the table.

Those respondents who responded "never" in Table 47 were asked to proceed to question number 39 of the survey which is reported in Table 51. Tables 48-50 will deal only with those who responded with the frequencies shown in Table 47.

The data in Table 48 showed the response to the question: Does the report show the cost of work injuries? The results indicated that 69.23% of the sample that responded to this question did not include in the injury summary report the cost of injuries while 30.77% did.

Table 48  
Inclusion of Injuries' Cost in  
Injury Summary Report

Response	Number	Percent
Included	12	30.77
Not included	27	<u>69.23</u>
Total	39	100.00

The data in Table 49 showed the response to the question: Does the report specify the area of the plant where the injury took place? For the organizations that responded 84.62% indicated their injury summary report specified the area of the plant where the injury took place, while 15.38% did not specify the area of the plant.



Table 49  
Location of Injury Specified in Summary Report

Response	Number	Percent
Specified	33	84.62
Not specified	<u>6</u>	<u>15.38</u>
Total	39	100.00

The data in Table 50 showed the response to the question: Do you think managers who receive the report understand it? The results indicated that 79.49% of the organizations thought that the managers understood the injury summary report, and 20.51% did not respond to the question.

Table 50  
Managers' Understanding of Injury Summary Report

Response	Number	Percent
Understood report	31	79.49
Did not understand report	0	.00
No answer	<u>8</u>	<u>20.51</u>
Total	39	100.00

The data in Table 51 showed the response to the question: When does the investigation usually take place in respect to time of

accidents? The results indicated that 64.08% of the sample surveyed investigated accidents immediately after the accident occurred, 12.62% investigated within two hours of the accident, 18.45% within the day, and 4.85% investigated accidents more than a week after they occurred.

Table 51  
Time of Accident Investigation

Response	Number	Percent
Immediately after the accident	66	64.08
Within two hours	13	12.62
Within the day	19	18.45
Within the week	0	.00
More than a week	<u>5</u>	<u>4.85</u>
Total	103	100.00

The data in Table 52 showed the response to the question: Who investigates accidents? Of the sample surveyed 27.18% indicated their plant managers conducted the investigations of the accident, 19.42% were conducted by production managers, 6.80% by general managers, and 6.80% and 5.83% by administrative and personnel managers respectively. Additionally, 22.33% of the sample had the supervisor conduct the accident investigations. Only 8.74% of the organizations had investigations performed by safety officers. Three organizations indicated no one investigates accidents in their facilities.

Table 52  
Investigators of Accidents

Response	Number	Percent
Plant manager	28	27.18
Production manager	20	19.42
General manager	7	6.80
Administrative manager	7	6.80
Personnel manager	6	5.83
Supervisor	23	22.33
Safety officer	9	8.74
No one	<u>3</u>	<u>2.91</u>
Total	103	100.00

The data in Table 53 showed the response to the question: What is the title of the highest executive or management representative who reviews the investigation reports? The results were that 48.54% of the sample surveyed indicated that their general managers reviewed accident investigation reports, 17.48% indicated that the plant manager did the reviews, 5.83% indicated personnel managers, 11.65% indicated administration managers, and 1.94% indicated supervisors. Additionally, 14.56% of the sample indicated no one reviewed accident investigation reports in their organization.

Table 53  
Title of Top Managers who Reviewed  
the Investigation Report

Response	Number	Percent
General manager	50	48.54
Plant manager	18	17.48
Personnel manager	6	5.83
Administrative manager	12	11.65
Supervisor	2	1.94
No one	<u>15</u>	<u>14.56</u>
Total	103	100.00

The data in Table 54 showed the response to the question: Who else gets a copy of the report? The results indicated that 21.36% of the sample surveyed have their general managers receive a copy of the accident investigation report, 14.56% were received by personnel managers, 6.80% by accountants, 8.74% by administrative managers, 5.83% by production managers, 1.94% by supervisors, and 2.91% by insurance companies. In addition, 37.86% of the sample indicated no additional persons received a copy of the accident investigation report.

The data in Table 55 showed the response to the question: Are employees required to report any potential safety hazards? The results indicated that 65.05% of the sample surveyed required their

employees to report any potential safety hazard, while 34.95% did not require their employees to report any potential safety hazards.

Table 54

Titles of Additional Persons Receiving Copy of  
Accident Investigation Report

Response	Number	Percent
General manager	22	21.36
Personnel manager	15	14.56
Accountant	7	6.80
Administrative manager	9	8.74
Production manager	6	5.83
Supervisor	2	1.94
Insurance company	3	2.91
No one	<u>39</u>	<u>37.86</u>
Total	103	100.00

Table 55

Employees Required to Report Potential  
Safety Hazards

Response	Number	Percent
Required	67	65.05
Not required	<u>36</u>	<u>34.95</u>
Total	103	100.00

Those who required their employees to report any potential hazards were asked the following question: In what form are they reported? The data in Table 56 showed that 76.12% of the sample who responded to the question received the potential safety hazard report in a verbal form while 23.88% received it in a written form.

Table 56  
Method of Reporting Potential Safety Hazards

Response	Number	Percent
In writing	16	23.88
Verbally	<u>51</u>	<u>76.12</u>
Total	67	100.00

Table 57  
Incentives for Reporting Potential Safety Hazards

Response	Number	Percent
Monetary	17	16.50
Recognition from management	48	46.60
Others: None	<u>38</u>	<u>36.90</u>
Total	103	100.00

The data in Table 57 showed the response to the question: What is the incentive for the employee who reports these hazards? The results

indicated that 46.60% of the sample surveyed gave only recognition to those employees who reported potential safety hazards, and 36.90% of the organization did nothing, while 16.50% of the sample gave monetary rewards to employees who reported potential safety hazards.

The data in Table 58 showed the response to the request: Please provide the following information, as accurately as possible, for the last two years. (If no accurate record was maintained, please provide a reasonable estimate.)

Table 58  
Industrial Respondents' Source of  
Accident Data

Response	Number	Percent
Records	14	13.59
Estimates	71	68.93
No answer	<u>18</u>	<u>17.48</u>
Total	103	100.00

The results showed that 13.59% of the sample surveyed provided the information shown in Table 59 from records, while 68.93% of the sample estimated their information. The results also showed that 17.48% did not provide any information regarding number of accidents. The majority of this 17.48% simply reported that they did not know.

Table 59  
Numbers and Types of Accidents

Response	RECORDS					
	1980			1981		
	No.	Mean	SD	No.	Mean	SD
Number of work-related injuries	14	15.86	24.31	13	19.69	41.72
Number of work-related injuries without lost workdays	8	12.13	10.55	8	14.38	17.25
Number of work-related injuries with lost workdays	9	13.56	21.74	8	17.13	34.83
Number of work-related illnesses	1	7.00	N/A	1	10.00	N/A
Number of work-related illnesses without lost workdays				1	1.00	N/A
Number of work-related illnesses with lost workdays	1	7.00	N/A	1	9.00	N/A
Number of disabling work injuries (no longer able to perform previous job)						
Number of fatal injuries (work-related)						
ESTIMATES						
Number of work-related injuries	57	16.53	25.53	69	20.07	36.06
Number of work-related injuries without lost workdays	36	16.97	29.15	48	17.00	32.33



Table 59 (continued)

Response	ESTIMATES					
	1980			1981		
	No.	Mean	SD	No.	Mean	SD
Number of work-related injuries with lost workdays	40	6.98	8.06	50	9.08	22.97
Number of work-related illnesses	17	13.12	11.82	23	10.52	12.11
Number of work-related illnesses without lost workdays	12	11.50	10.65	13	10.62	9.21
Number of work-related illnesses with lost workdays	8	8.00	5.61	13	6.38	7.16
Number of disabling work injuries (no longer able to perform previous job)	5	1.40	.89	8	1.38	.74
Number of fatal injuries (work-related)				2	1.00	.00
	RECORDS AND ESTIMATES					
Number of work-related injuries	71	16.34	25.15	82	20.01	36.73
Number of work-related injuries without lost workdays	44	16.09	26.70	56	16.63	30.53
Number of work-related injuries with lost workdays	49	8.18	11.75	58	10.19	24.70
Number of work-related illnesses	18	12.78	11.56	24	10.50	11.84

Table 59 (continued)

Response	RECORDS AND ESTIMATES					
	1980			1981		
	No.	Mean	SD	No.	Mean	SD
Number of work-related illnesses without lost workdays	12	11.50	10.65	14	9.93	9.21
Number of work-related illnesses with lost workdays	9	7.89	5.25	14	6.57	6.91
Number of disabling work injuries (no longer able to perform previous job)	5	1.40	.89	8	1.38	.74
Number of fatal injuries (work-related)				2	1.00	.00
	TOTAL INJURIES/ILLNESSES/FATALITIES					
	1980			1981		
Number of work-related injuries			1160			1641
Number of work-related illnesses			230			252
Number of disabling work injuries (no longer able to perform previous job)			7			11
Number of fatal injuries (work-related)			<u>0</u>			<u>2</u>
Total			1397			1906

Note. SD = Standard deviation  
No = Number of respondents

The results in Table 59 showed that 1160 total work-related injuries took place in 1980 by those organizations that responded to the request. The mean number of work-related injuries for 1980, from both records and estimates, was 16.34 injuries per organization. The data also showed that 230 total work-related illnesses, both estimated and recorded, took place in 1980, and seven disabling injuries. For 1981, both estimates and records, the total work-related injuries were 1641, with the mean number of the work-related injuries per organization being 20.01. The results also showed that for 1981 there were 252 work-related illnesses, 11 disabling injuries, and two fatal injuries. Finally, the data indicated that there was an increase of 509 or 36.44% in the number of accidents from 1980 to 1981.

#### Physical Surveys

The data in Table 60 showed the response to the question: Do you conduct routine safety inspections of your facilities? The results indicated that 72.82% of the sample surveyed conducted routine safety inspections of their facilities, while 27.18% did not conduct inspections. Those who did not inspect were asked to proceed to question 49 of the survey which is reported in Table 65. Those who inspected their facilities were asked the following question: Who makes the inspection? Their responses were grouped in Table 61. The results indicated that 25.33% of those organizations who inspected their facilities had their general managers perform the inspection, 22.67% had their plant managers, 18.67% their production manager, and

Table 60  
Routine Safety Inspections of Facilities

Response	Number	Percent
Inspected facilities	75	72.82
Did not inspect facilities	<u>28</u>	<u>27.18</u>
Total	103	100.00

Table 61  
Title of Persons Performing the  
Inspection of the Facilities

Response	Number	Percent
General manager	19	25.33
Plant manager	17	22.67
Production manager	14	18.67
Safety supervisor	8	10.67
Supervisor	7	9.33
Personnel manager	3	4.00
Maintenance manager	3	4.00
Store keeper	2	2.67
Physician/training officer	<u>2</u>	<u>2.67</u>
Total	75	100.00

10.67% and 9.33% had their safety supervisors and supervisors perform the inspection. The results also showed that 4% of the sample surveyed performed the inspection of the facilities by the personnel managers, 4% by the maintenance managers, 2.67% by the store keepers, and 2.67% by either the plant physician or the training officer.

Additionally, those organizations who inspected their facilities were also asked the following question: How often are inspections made? Their responses are shown in Table 62. The results indicated that 44% of those organizations who inspected their facilities performed the inspection daily, 26.67% weekly, 12% once/month, and 1.33% each twice/month, three and four times/year. The results also showed that 4% of the organizations who performed inspections indicated that they were done "when needed," 2.67% conducted "surprise checks," and 2.67% inspected "occasionally" or "less than once a year." Finally the results showed that 4% of the 75 organizations did not respond to this question.

Table 62  
Frequency of Safety Inspections

Response	Number	Percent
Daily	33	44.00
Once/week	20	26.67
Once/month	9	12.00
Twice/month	1	1.33
Once/year	0	.00
Twice/year	0	.00
Three times/year	1	1.33
Four times/year	1	1.33
Others: When needed	3	4.00
Surprise check	2	2.67
Occasionally	2	2.67
No answer	<u>3</u>	<u>4.00</u>
Total	75	100.00

The data in Table 63 showed the response to the question: Are inspectors given specific training for the inspection job? The results indicated that 80% of the responding organizations did not give any specific training for the inspectors, while only 20% did give specific training for inspection. Finally, those organizations who provided inspection training were asked: Who reviews the inspector's report? Their responses in Table 64 indicated that 40% of the organizations responding to this question had no one to review the inspection

report, while 20% were reviewed by general managers, 16% by plant managers, and 5.33% by production managers. The results also showed that 13.33% of the organizations had the inspection reports reviewed by the administration managers, and 5.33% by the personnel managers.

Table 63

## Provision of Inspection Training for Inspectors

Response	Number	Percent
Provided	15	20.00
Not provided	<u>60</u>	<u>80.00</u>
Total	75	100.00

Table 64

## Title of Persons Reviewing the Inspector's Report

Response	Number	Percent
General manager	15	20.00
Plant manager	12	16.00
Administration manager	10	13.33
Production manager	4	5.33
Personnel manager	4	5.33
No one	<u>30</u>	<u>40.00</u>
Total	75	100.00

### Medical Support

The data in Table 65 showed the response to the question: Is the plant provided with first-aid material? The results indicated that 94.17% of the sample surveyed had first-aid materials available in their facilities, while 5.83% did not have first-aid material.

Table 65  
Availability of First-Aid Material in Plants

Response	Number	Percent
Available	97	94.17
Not available	<u>6</u>	<u>5.83</u>
Total	103	100.00

Those organizations who had first-aid material available in their plants were asked the following questions:

1. Are they inspected periodically?
2. Do you have a written procedure for replenishing first-aid material?
3. Who is responsible for replenishment?

Their responses are shown in Tables 66, 67 and 68 respectively. The data in Table 66 showed that 84.54% of the organizations that responded to this question performed periodical inspections of first-aid material, while 15.46% of them did not perform periodical inspection of first-aid material.



Table 66  
Inspection of First-Aid Material

Response	Number	Percent
Inspected	82	84.54
Did not inspect	<u>15</u>	<u>15.46</u>
Total	97	100.00

The data in Table 67 showed that 68.04% of the organizations that responded to this question did not have written procedures for the replenishments of first-aid material, while 31.96% had a written procedure.

The data in Table 68 showed that 16.49% of the organizations that responded to this question had a nurse/doctor responsible for replenishing first-aid material, 14.43% had their plant managers responsible, 10.31% their purchasing managers, 11.43% their production managers, 10.31% their supervisors, 11.34% their store keepers, 3.09% their general managers, 7.22% their foremen, 5.15% their personnel managers, and 9.28% had no one responsible for the replenishment of first-aid material.

Table 67

Availability of Written Procedures for First-Aid  
Material Replenishments

Response	Number	Percent
Available	31	31.96
Not available	<u>66</u>	<u>68.04</u>
Total	97	100.00

Table 68

Title of Persons Responsible for the Replenishments  
of First-Aid Material

Response	Number	Percent
Plant manager	14	14.43
General manager	3	3.09
Purchasing manager	10	11.34
Production manager	11	11.34
Personnel manager	5	5.15
Supervisor	11	10.31
Foreman	7	7.22
Store keeper	11	11.34
Nurse/physician	16	16.49
No one	<u>9</u>	<u>9.28</u>
Total	97	100.00

The data in Table 69 showed the response to the question: Does your company have an in-house nurse or a doctor? The results indicated that 75.73% of the sample surveyed did not have an in-house nurse/doctor, while 23.30% did. Only one organization did not respond to the question.

Table 69  
In-House Availability of Nurse/Doctor

Response	Number	Percent
Available	24	23.30
Not available	78	75.73
No answer	<u>1</u>	<u>.97</u>
Total	103	100.00

Those organizations who had a nurse/doctor available were asked to proceed to question 52, and those who did not have a nurse/doctor available were asked to answer the following questions:

1. Are trained medical personnel on duty in your plant?
2. Who?

Tables 70 and 71 showed their responses.

The data in Table 70 showed that of the 78 organizations that did not have an in-house nurse/doctor, 88.46% also did not have medically trained personnel in their facilities. Only 10.26% of them had medically trained personnel, and their titles are shown in Table 71. The data also showed that one organization did not respond to the question.

Table 70  
Availability of Medically Trained Personnel in Plants

Response	Number	Percent
Available	8	10.26
Not available	69	88.46
No answer	<u>1</u>	<u>1.28</u>
Total	78	100.00

Table 71  
Title of Medically Trained Personnel

Response	Number	Percent
Clerk	1	12.50
Store keeper	4	50.00
Supervisor	1	12.50
Assistant technical manager	1	12.50
Personnel manager	<u>1</u>	<u>12.50</u>
Total	8	100.00

The data in Table 71 showed the title of the position and number of those personnel who are medically trained in the eight organizations who responded to the question. The data showed that 50% of them were in the position of store keeper and the other 50% were in

—

the position of the assistant technical manager, personnel manager, supervisor, or a clerk.

The data in Table 72 showed the response to the question: If you do not have an in-house nurse or doctor, do you have one on call? The results indicated that 50% of the organizations who did not have an in-house nurse/doctor had one on call, while 47.44% had neither. The data also showed that 2.56% of the organizations did not respond to the question. Additionally, the data from Tables 69-72 portrayed that 35.92% (37 organizations as indicated in Table 72) did not have an in-house nurse/doctor, one on call, nor medically trained personnel in their facilities.

Table 72  
Physician Available on Call

Response	Number	Percent
Available	39	50.00
Not available	37	47.44
No answer	<u>2</u>	<u>2.56</u>
Total	78	100.00

The data in Table 73 showed the response to the question: Do you have, in your facilities, a first-aid room? The results indicated that 80.58% of the sample surveyed did not have in their facilities a first-aid room, while 19.42% did have one.

Table 73  
Availability of First-Aid Room  
in Facilities

Response	Number	Percent
Available	20	19.42
Not available	<u>83</u>	<u>80.58</u>
Total	103	100.00

The data in Table 74 showed the response to the question: Do you have an assigned vehicle to carry injured persons to hospitals? The results indicated that 81.55% of the sample surveyed did not have an assigned vehicle for transporting injured persons to hospitals, while 18.45% did have such a vehicle.

Table 74  
Availability of an Assigned Vehicle for Transporting  
Injured Persons to Hospitals

Response	Number	Percent
Available	19	18.45
Not available	<u>84</u>	<u>81.55</u>
Total	103	100.00

The data in Table 75 showed the response to the question: Is an accurate log kept of all first-aid/medical treatment? The results

—

indicated that 73.79% of the sample surveyed did not keep a log of first-aid/medical treatment while 25.24% did. Only one organization did not respond to the question.

Table 75  
Keeping of First-Aid/Medical Treatment Log

Response	Number	Percent
Kept log	26	25.24
Did not keep log	76	73.79
No answer	<u>1</u>	<u>.97</u>
Total	103	100.00

The data in Table 76 showed the response to the question: Are pre-employment physical examinations given to all employees? The results were that 58.25% of the sample surveyed gave pre-employment physical examinations, while 41.75% did not give pre-employment physical examinations.

Table 76  
Provision of Pre-Employment Physical  
Examinations to all Employees

Response	Number	Percent
Provided	60	58.25
Not provided	<u>43</u>	<u>41.75</u>
Total	103	100.00

—

The data in Table 77 showed the response to the question: Have employees been instructed as to what to do in case of an accident or emergency? The results were that 74.76% of the sample surveyed instructed their employees as to what to do in case of an accident or emergency, while 25.24% did not.

Table 77  
Provision of Accident/Emergency Instructions  
to Employees

Response	Number	Percent
Provided	77	74.76
Not provided	<u>26</u>	<u>25.24</u>
Total	103	100.00

Table 78  
Availability of a Life Threatening  
Emergency Evacuation Plan

Response	Number	Percent
Plan available	28	27.18
Plan not available	<u>75</u>	<u>72.82</u>
Total	103	100.00

The data in Table 78 showed the response to the question: Do you have an employee evacuation plan in the event of a life threatening



emergency? The results indicated that 72.82% of the sample surveyed had no employee evacuation plan in the event of a life threatening emergency, while 27.18% had an evacuation plan.

Those who had an evacuation plan were asked to answer the following questions:

1. Is the evacuation plan reviewed periodically?
2. Do you conduct emergency evacuation drills periodically?
3. How often do you conduct these drills?

Their responses are shown in Tables 79, 80, and 81 respectively.

Table 79  
Periodical Review of Evacuation Plan

Response	Number	Percent
Periodically reviewed	20	71.43
Not periodically reviewed	7	25.00
No answer	<u>1</u>	<u>3.57</u>
Total	28	100.00

The results in Table 79 showed that 71.43% of those organizations who had an evacuation plan reviewed it periodically, while 25% did not review it. The results also showed that one organization did not respond to the question.

The results in Table 80 showed that 64.29% of those organizations who had an evacuation plan did not conduct emergency evacuation

exercise drills, while 32.14% did. The results also showed that one organization did not respond to the question.

Table 80  
Periodical Evacuation Drills

Response	Number	Percent
Drills exercised	9	32.14
Drills not exercised	18	64.29
No answer	<u>1</u>	<u>3.57</u>
Total	28	100.00

Table 81  
Frequency of Conducting Emergency  
Evacuation Drills

Response	Number	Percent
Once/year	4	44.44
Twice/year	3	33.33
Others: Monthly	<u>2</u>	<u>22.22</u>
Total	9	100.00

The results in Table 81 indicated that 44.44% of those organizations who conducted emergency evacuation drills periodically conducted them once/year, 33.33% twice/year, and 22.22% monthly.

Motivation

The data in Table 82 showed the response to the question: Do you conduct safety contests between divisions of your plant? The results indicated that 92.23% of the sample surveyed did not conduct safety contests in their organizations. Only 7.77% of the sample conducted safety contests in their organization.

Table 82  
Safety Contests Between Divisions of Plant

Response	Number	Percent
Conducted contests	8	7.77
Did not conduct contests	<u>95</u>	<u>92.23</u>
Total	103	100.00

Those organizations who conducted safety contests were asked the following question: Do you attach a reward to the contest result? Their responses are shown in Table 83. Half of the organizations who conducted safety contests between divisions of their organizations did attach a reward to the contest results, the other half did not.

Table 83  
Attachment of a Reward to Contest Results

Response	Number	Percent
Reward attached	4	50.00
No reward attached	<u>4</u>	<u>50.00</u>
Total	8	100.00

Those organizations that conducted safety contests were asked the following question: What form are the rewards? Their responses are shown in Table 84 and they indicated that 50% of the organizations who attach a reward to the contest results gave a monetary one, and 50% gave the reward in trophies.

Table 84  
Types of Safety Contest Rewards

Response	Number	Percent
Monetary	2	50.00
Trophies	2	50.00
Letter of recognition	<u>0</u>	<u>.00</u>
Total	4	100.00

The data in Table 85 showed the response to the question: Do you show safety films to employees? The results indicated that 94.17% of

the sample surveyed did not show any safety films to their employees, while 5.83% did show safety films. Those organizations who showed safety films to employees were asked to identify the frequency of showing safety films. Their responses are shown in Table 86.

Table 85  
Showing of Safety Films to Employees

Response	Number	Percent
Showed films	6	5.83
Did not show films	<u>97</u>	<u>94.17</u>
Total	103	100.00

Table 86  
Frequency of Showing Safety Films by Organizations

Response	Number	Percent
Once/week	0	.00
Once/month	0	.00
Twice/month	0	.00
Once/year	2	33.33
Twice/year	1	16.67
Three times/year	1	16.67
Other: When available	<u>2</u>	<u>33.33</u>
Total	6	100.00

The results in Table 86 showed that 33.33% of the organizations who showed safety films to their employees showed it once/year, 16.67% twice/year or three times/year. The table also showed that 33.33% showed safety films only when they were available.

The data in Table 87 showed the response to the question: Do you have safety posters in the plant area? The results indicated that 62.14% of the sample surveyed did not have safety posters in the plant area of their facilities, while 37.86% did have safety posters. Those organizations who had safety posters in their plants were asked the following question: How often do you change them with other posters? Their responses are shown in Table 88 and they indicated that 41.03% of those organizations who had safety posters in the plant area of their facilities changed them with other posters once/year, 12.82% changed them twice/year, 2.56% changed them three times/year, 23.08% never changed them, 12.82% when new ones became available, and 7.69% when they were damaged.

Table 87  
Availability of Safety Posters  
in Plant Area

Response	Number	Percent
Available	39	37.86
Not available	<u>64</u>	<u>62.14</u>
Total	103	100.00

Table 88  
Frequency of Changing Safety Posters  
with Others

Response	Number	Percent
Once/year	16	41.03
Twice/year	5	12.82
Three times/year	1	2.56
Other: Never	9	23.08
When they become available	5	12.82
When damaged	<u>3</u>	<u>7.69</u>
Total	39	100.00

The data in Table 89 showed the response to the question: Do you give rewards to outstanding employees or divisions of your plant when safety goals are met? The results indicated that 84.47% of the sample surveyed did not give rewards to outstanding employees or divisions of their plant when safety goals were met. Only 15.53% of the sample surveyed did give such rewards. Those organizations who rewarded employees meeting safety goals were asked the following question: What form are the rewards? Their responses are shown in Table 90.

Table 89  
Rewarding Employees Meeting Safety Goals

Response	Number	Percent
Rewarded	16	15.53
Not rewarded	<u>87</u>	<u>84.47</u>
Total	103	100.00

The results in Table 90 showed that 68.75% of the organizations who gave rewards to employees for meeting safety goals gave it in monetary form, 6.25% gave recognition through trophies or letters of recognition. The results also showed that 18.75% of those organizations gave the reward in both a monetary form and through letters of recognition.

Table 90  
Types of Rewards to Employees  
Meeting Safety Goals

Response	Number	Percent
a) Monetary	11	68.75
b) Trophies	1	6.25
c) Letter of recognition	1	6.25
d) Other: a and c	<u>3</u>	<u>18.75</u>
Total	16	100.00



General Support Information

The data in Table 91 showed the response to the question: In a scale of one to ten, where would you rank the effectiveness of your safety activities? (1 = Low; 10 = High)

Table 91

## Rank Effectiveness of Organizations' Safety Activities

Rank/Response	Number	Cumulative Percent	Percent
1 (low)	15	14.56	14.56
2	7	21.36	6.80
3	11	32.04	10.68
4	15	46.60	14.56
5	15	61.16	14.56
6	13	73.78	12.62
7	8	81.55	7.77
8	14	95.14	13.59
9	3	98.06	2.92
10 (high)	1	99.03	.97
No answer	<u>1</u>	100.00	<u>.97</u>
Total	103		100.00

The results in Table 91 indicated that 81.55% of the sample surveyed ranked their safety activity effectiveness below rank 8, 17.48% above rank 7. The results also showed that 61.16% of the

sample surveyed ranked their safety activities' effectiveness below rank 6, and 37.87% above rank 5. Only 3.89% of the sample ranked themselves in ranks 9 and 10.

The data in Table 92 showed the response to the question: Would you welcome assistance in improving or developing a safety program for your organization? The results indicated that 86.41% of the sample surveyed would accept assistance in improving or developing a safety program for their organization, while 8.74% would not accept the assistance, and 4.85% did not respond to the question.

Table 92  
Willingness to Accept Assistance in Improving or  
Developing Safety Programs

Response	Number	Percent
Willing	89	86.41
Not willing	9	8.74
No answer	<u>5</u>	<u>4.85</u>
Total	103	100.00

Those organizations who did not welcome assistance in improving or developing a safety program were asked to indicate their reason. Their responses are shown in Table 93.

Table 93

Reasons for not Welcoming Assistance in Improving or  
Developing a Safety Program

Response	Number
We are small, not necessary	2
No one cares	1
We have safe operations	1
Few accidents and injuries, therefore, no need	2
We are already adequate	1
Because we want to save money	1
Because I have a very low regard for safety organizations	<u>1</u>
Total	9

Industries' Perceptions of Government Supports and Activities

The data in Table 94 showed the level of agreement or disagreement of Saudi industries to government support and activities. The data showed that 51.46% of the sample surveyed agreed and 40.78% strongly agreed that the government must develop and implement an industrial safety program for Saudi industry; that 52.43% of the sample surveyed agreed and 42.72% strongly agreed that the government must adopt and promote industrial safety rules and regulations; that 52.43% of the sample surveyed agreed and 38.83% strongly agreed that the government should provide assistance to industry in developing industrial safety programs; that 51.46% of the sample surveyed disagreed and 12.62%

Table 94  
Industries' Perceptions of Government Supports and Activities

Statements	Levels of Agreement/Disagreement																				
	SD	D	N	A	SA	NA	T	#	%	#	%										
The government must develop and implement an industrial safety program for Saudi industry	1	2	5	53	42	0	103	1	0.97	2	1.94	5	4.85	53	51.46	42	40.78	0	.00	103	100.00
The government must adopt and promote industrial safety rules and regulations	0	2	3	54	44	0	103	0	.00	2	1.94	3	2.91	54	52.43	44	42.72	0	.00	103	100.00
The government should provide assistance to industry in developing industrial safety programs	1	3	5	54	40	0	103	1	.97	3	2.91	5	4.85	54	52.43	40	38.83	0	.00	103	100.00
An adequate government industrial safety program already exists	13	52	35	3	0	0	103	13	12.62	52	51.46	35	33.01	3	2.91	0	.00	0	.00	103	100.00

Table 94 (continued)

Statements	SD		D		N		A		SA		NA		T	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
The government has provided us with a clear unambiguous set of written industrial safety rules and regulations that are strictly followed	15	14.56	64	62.14	21	20.39	2	1.94	0	.00	1	.97	103	100.00
These rules and regulations are strictly enforced by the government	14	13.59	68	66.02	20	19.42	1	.97	0	.00	0	.00	103	100.00
Government inspectors should visit us at least once a year	2	1.94	4	3.88	9	8.74	67	65.05	20	19.42	1	.97	103	100.00
Government inspectors should make follow-up visits to insure violations have been corrected	1	.97	3	2.91	7	6.80	70	67.96	21	20.39	1	.97	103	100.00
Government inspectors should give citations for uncorrected violations of safety conditions	2	1.94	8	7.77	7	6.80	71	68.93	15	14.56	0	.00	103	100.00

Table 94 (continued)

Statements	SD		D		N		A		SA		NA		T	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
The government inspectors are generally well trained in industrial safety practices and usually provide our organization with professional safety recommendations	9	8.74	48	46.60	43	41.75	1	.97	2	1.94	0	.00	103	100.00
At present there is too much control by the government in industrial safety matters	15	14.56	65	63.11	23	22.33	0	.00	0	.00	0	.00	103	100.00
At present there are too many rules and regulations by the government regarding industrial safety	7	6.80	73	70.87	22	21.36	1	.97	0	.00	0	.00	103	100.00
Presently the government is doing an adequate job in preventing industrial accidents	6	5.83	70	67.96	25	24.27	2	1.94	0	.00	0	.00	103	100.00

Table 94 (continued)

Statements	SD		D		N		A		SA		NA		T	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
At present there is a government agency that provides industry with assistance in preventing industrial accidents	7	6.80	74	71.84	17	16.50	4	3.88	1	.97	0	.00	103	100.00
The government should publish and provide industry with a copy of industrial safety standards	0	.00	0	.00	2	1.94	56	54.37	45	43.69	0	.00	103	100.00
Industrial safety training courses should be offered free of charge regularly at local schools and training centers	0	.00	2	1.94	3	2.91	53	51.46	44	42.72	1	.97	103	100.00

Note. SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree; NA = No Answer; T = Total; # = Number; % = Percent.

strongly disagreed that an adequate government industrial safety program already exists, while 33.01% were neutral.

The data also showed that 62.14% of the sample surveyed disagreed and 14.56% strongly disagreed that the government has provided them with a clear unambiguous set of written industrial safety rules and regulations that were strictly followed, while 20.39% were neutral; that 66.02% of the sample surveyed disagreed and 13.59% strongly disagreed that these rules and regulations were strictly enforced by the government while 19.42% were neutral with the statement; that 65.05% of the sample surveyed agreed and 19.42% strongly agreed that government inspectors should visit them at least once a year; that 67.96% of the sample surveyed agreed and 20.39% strongly agreed that government inspectors should make follow-up visits to insure violations have been corrected; that 68.93% of the sample surveyed agreed and 14.56% strongly agreed that government inspectors should give citations for uncorrected violations of safety conditions; and that 46.60% of the sample surveyed disagreed and 8.74% strongly disagreed that government inspectors were generally well trained in industrial safety practices and usually provided their organizations with professional safety recommendations while 41.75% were neutral to the statement.

Additionally, the data indicated that 63.11% of the sample surveyed disagreed and 14.56% strongly disagreed that at present there is too much control by the government in industrial safety matters while 22.33% were neutral to the statement; that 70.87% of the sample surveyed disagreed and 6.80% strongly disagreed that at present there



are too many rules and regulations by the government regarding industrial safety, while 21.36% were neutral to the statement; and that 67.96% of the sample surveyed disagreed and 5.83% strongly disagreed that presently the government is doing an adequate job in preventing industrial accidents and 24.27% were neutral to the statement.

Finally, the data showed that 71.84% of the sample surveyed disagreed and 6.80% strongly disagreed that at present there is a government agency that provides industry with assistance in preventing industrial accidents, while 16.50% of the sample were neutral to the statement; that 54.37% of the sample surveyed agreed and 43.69% strongly agreed that the government should publish and provide industry with a copy of industrial safety standards; and that 51.46% of the sample surveyed agreed and 42.72% strongly agreed that industrial safety training courses should be offered free of charge regularly at local schools and training centers.

#### Industries' Perceptions of Occupational Safety and Health

The data in Table 95 showed the level of agreement or disagreement of Saudi industries pertaining to occupational safety and health concerns. The data showed that 55.34% of the sample surveyed agreed and 29.13% strongly agreed that industrial accidents reduced their efficiency and increased their operation costs; that 33.98% of the sample surveyed disagreed and 16.50% strongly disagreed that industrial accidents are part of life and must be accepted as such by management while 31.07% agreed and 9.71% strongly agreed and 8.74% were neutral to the statement, and that 46.60% of the sample surveyed

Table 95

Industries' Perceptions of Occupational Safety and Health

		Levels of Agreement/Disagreement												
		SD	D	N	A	SA	NA	T						
Statements	#	%	#	%	#	%	#	%	#	%	#	%		
Industrial accidents reduce our efficiency and increase our operation costs	2	1.94	4	3.88	9	8.74	57	55.34	30	29.13	1	.97	103	100.00
Industrial accidents are part of life and must be accepted as such by management	17	16.50	35	33.98	9	8.74	32	31.07	10	9.71	0	.00	103	100.00
Many of the present day occupational illness with which people suffer could not have been anticipated or avoided	9	8.74	48	46.60	16	15.53	26	25.25	4	3.88	0	.00	103	100.00
A monetary value can be placed on human life and safety	21	20.39	34	33.01	22	21.36	21	20.39	5	4.85	0	.00	103	100.00

Table 95 (continued)

Statements	SD		D		N		A		SA		NA		T	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
The benefits of safety out weigh its cost	2	1.94	9	8.74	10	9.71	49	47.57	33	32.04	0	.00	103	100.00
Safety is the most important element of the working environment	0	.00	4	3.88	8	7.77	52	50.49	38	36.89	1	.97	103	100.00

Note. SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree;  
NA = No Answer; T = Total; # = Number; % = Percent.

disagreed and 8.74% strongly disagreed that many of the present day occupational illness with which people suffer could not have been anticipated or avoided while 25.24% of the sample agreed and 3.24% strongly agreed and 15.53% were neutral to the statement.

The data also indicated that 33.01% of the sample surveyed disagreed and 20.39% strongly disagreed that a monetary value can be placed on human life and safety while 20.39% of the respondents agreed and 4.85% strongly agreed and 21.36% were neutral to the statement; that 47.57% of the sample surveyed agreed and 32.04% strongly agreed that the benefits of safety outweigh its cost while 20.39% either disagreed or were neutral; and that 50.49% of the sample surveyed agreed and 36.89% strongly agreed that safety is the most important element of the working environment.

Table 96  
Organizations Interested in Receiving the  
Results of This Survey

Response	Number	Percent
Interested	88	85.44
Not interested	11	10.68
No answer	<u>4</u>	<u>3.88</u>
Total	103	100.00

Finally, the sample surveyed were asked the following question:  
Are you interested in receiving the results of this survey? Their

responses are shown in Table 96 which showed that 85.44% of the sample surveyed were interested in receiving the results of this survey, while 10.68% were not interested. The data also showed that 3.88% of the sample did not respond to this question. Those organizations who were interested in receiving the results of this survey provided their addresses.

### The Interview

As discussed in Chapter III, the interview was conducted with 20 government officials of 12 government ministries, agencies, and educational institutions. The interview schedule contained 32 questions. Not all questions apply to every official interviewed. The officials in the administrative branches of the government were asked all questions except questions 18, 19, and 20 because they apply only to educational institutions. Those officials in the educational/institution branches of the government were asked all questions except questions 1, 7, 14, 15, and 16 because they apply only to administrative agencies. Accordingly, the presentation of the interview findings will be divided into three sections, namely:

1. Responses to questions common to both officials in the administrative and educational branches of the government. They have responded to questions 2-6, 8-13, 17, and 21-32.
2. Responses to questions common only to officials of the administrative branches of the government. They have responded to questions 1, 7, 14, 15, and 16.

3. Responses to questions common only to officials of the educational/institution branches of the government. They have responded to questions 18, 19, and 20.

Responses to Questions Common to Both Officials  
in the Administrative and Educational  
Branches of the Government

The data in Tables 97 and 98 showed the responses of the officials interviewed to their department's current activities regarding industrial safety. The data in Table 97 showed the number of activities and the number of departments performing these activities, while the data in Table 98 listed these activities.

Table 97

Number of Current Departmental Industrial  
Safety Activities

Number of Activities	Number	Percent
3	2	10.00
2	6	30.00
1	6	30.00
0	<u>6</u>	<u>30.00</u>
Total	20	100.00

The data showed that two of the officials interviewed indicated their departments were involved in three activities, six each were involved in two, one, or no activities at all. The data in Table 98

showed the types of activities in which the interviewed officials' departments were involved.

Table 98

Current Departmental Activities Performed by  
Departments of Interviewed Officials  
Regarding Industrial Safety

Activity
Promoting industrial safety
Enforcing rules and regulations in industry
Evaluating the problem dimension
Operating an occupational health clinic
Identifying facilities' security requirements
Supervising facilities' security requirements
Issuing minimum security requirements
Approving and enforcing industrial facilities' fire code
Coordinating industrial facilities' security
Drafting of safety rules and regulations
Preparing and issuing safety pamphlets
Publishing safety standards
Devising safety curriculum
Installing and providing protective equipment and devices in vocational training centers
Offering elementary industrial safety class
Operating a newly established safety department
Offering on-the-job safety training
Giving students unwritten elementary instructions using safety educational aids

Table 98 (continued)

Activity
Conducting research and seminars on Saudi industry
Offering an industrial safety course as part of the mechanical engineering degree
Nothing

The data in Tables 99 and 100 showed the future governmental plans and the types of plans of the different departments whose officials were interviewed. The results in Table 99 showed that 5% of the departmental officials interviewed had four future plans regarding industrial safety, 30% had three plans or no plans at all, 15% had two plans, 20% had one plan. The results in Table 100 showed a list of all the future plans of the departments' officials interviewed.

Table 99

Number of Future Departmental Industrial  
Safety Plans

Number of plans	Number of departments	Percent
4	1	5.00
3	6	30.00
2	3	15.00
1	4	20.00
0	<u>6</u>	<u>30.00</u>
Total	20	100.00



Table 100

Types of Future Departments' Activities Planned  
for Industrial Safety

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**Future Plans of Departments**

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Make industrial safety an objective

Issue a safety policy

Develop and implement a safety program

Improve the elementary safety course

Train instructors

Install safety equipment in training centers

Approve the quality symbol

Conduct industrial safety seminars

Control and approve the quality of both products and facilities

Apply safety rules and regulations to industry

Coordinate with Civil Defense and Ministry of Labor the application of safety rules and regulations

Include industrial safety in addition to our activities of fire fighting and prevention

Encourage industry to assign fire fighting and prevention personnel

Introduce civil defense principles in educational systems

Enforce the minimum security requirements for government industrial facilities

Staff department with occupational health specialists

Establish laboratory for controlling industrial contaminants

Build five occupational health clinics

Publish occupational safety and health rules

Table 100 (continued)

Future Plans of Departments
Build an industrial safety institute
Publish an occupational safety and health magazine
Increase research
Use media to spread industrial safety awareness
Include industrial safety in the curriculum
Introduce a general industrial safety course
None

The data in Table 101 showed the provision of safety training/education by the departments whose officials were interviewed, and the data in Table 102 showed the nature of safety training/education by those departments that provided such training or education for their employees.

Table 101  
Provision of Safety Training/Education  
by Departments for Employees

Response	Number	Percent
Training/education provided	8	40.00
Training/education not provided	<u>12</u>	<u>60.00</u>
Total	20	100.00

Table 102  
Nature of Safety Training/Education Provided

Response	Number	Percent
Elementary training course	5	62.00
Seminars	4	50.00
Education	2	25.00

The results in Table 101 showed that 60% of the departments did not provide safety training/education for their employees while 40% did and the results in Table 102 showed that elementary training was mentioned by 62% of those departments who provided training/education to their employees, seminars were mentioned by 50%, and education by 25% of the departments.

The data in Table 103 showed the division's title that was responsible for the training/education of department employees which indicated that 62.5% of the departments that provided training/education to their employees had a training/education division while 37.5% had no division. The data in Table 104 showed the rate of staffing the divisions with trained/educated staff in the practices and theories of industrial safety which indicated that 62.50% of the departments who had a training division staffed it with trained personnel in the practices and theories of industrial safety, while 25% did not and 12.50% did not respond to this question.

Table 103

Divisions' Title Responsible for Training/Education  
within Departments

Response	Number	Percent
Education and training	1	12.50
Training	1	12.50
Technical	2	25.00
Preventive security	1	12.50
No division	<u>3</u>	<u>37.50</u>
Total	8	100.00

Table 104

Divisions' Staffing with Trained/Educated Staff in  
Practices and Theories of Industrial Safety

Response	Number	Percent
Staffed	5	62.50
Not staffed	2	25.00
No answer	<u>1</u>	<u>12.5</u>
Total	8	100.00

Table 105

Type of Training/Education of the Staff of the Divisions  
Responsible for Training/Education

Response	Number	Percent
Engineering, occupational, health, safety, engineering	1	20.00
Training in facilities' security	1	20.00
Civil defense and public security	1	20.00
Field training	1	20.00
What was received as part of engineering degree	<u>1</u>	<u>20.00</u>
Total	5	100.00

The data in Table 105 showed the divisions' staff level of training/education in the practices and theories of industrial safety which indicated that 40% of the divisions who had trained/educated staff in industrial safety were specialized in different areas of industrial safety, and 60% had staff which was either trained in a specific field, general training, or that which was received as part of their engineering degrees.

The data in Table 106 showed the rate of departments offering formal courses in industrial safety which indicated that 80% of the departments whose officials were interviewed did not offer any formal courses in industrial safety education/training, while 20% did.

Table 106  
 Departments Offering Formal Industrial Safety Courses

Response	Number	Percent
Offered	4	20.00
Did not offer	<u>16</u>	<u>80.00</u>
Total	20	100.00

The data in Table 107 showed the rate of cooperation or coordination among/between departments and educational institutions for introducing or incorporating industrial safety courses in their curriculum which indicated that 65% of the departments and educational institutions had no cooperation or coordination among them to introduce or incorporate industrial safety in the curriculum. Only 35% of them had such cooperation or coordination.

Table 107  
 Cooperation/Coordination Among/Between Departments and Educational  
 Institutions for Introducing/Incorporating Industrial  
 Safety Courses in Curriculum

Response	Number	Percent
Cooperated/coordinated	7	35.00
Did not cooperate/coordinate	<u>13</u>	<u>65.00</u>
Total	20	100.00

Table 108

Types of Educational Institutions that Cooperate with  
Departments/Institutions in Introducing Industrial  
Safety into the Curriculum

Educational institutions	Number of departments/ institutions	Percent
Vocational training centers	3	42.86
Technical institutes	2	28.57
Medical training centers	2	28.57
Universities	3	42.86
Girls, schools	1	14.29

The data in Table 108 showed the type of educational institution and the rate of departments or other institutions that cooperated or coordinated in introducing or incorporating industrial safety into their curriculum which indicated that 42.86% of the departments and institutions had cooperated with vocational training centers and universities in introducing or incorporating safety into their curriculum, 28.57% of the departments reported that they had cooperated with technical institutes and medical training centers, and 14.29% mentioned their cooperation with girls' schools.

The data in Tables 109 and 110 showed the recommendations suggested by the departments whose officials were interviewed and a list of those recommendations respectively. The data in Table 109 showed that 45% of the respondents gave three recommendations for

improving the status of industrial safety in Saudi Arabia; 35% submitted two recommendations; 15%, one recommendation; and 5%, five recommendations.

Table 109

Number of Recommendations Suggested by Interviewed  
Officials of Departments and Institutions

Number of recommendations	Number of departments	Percent
5	1	5.00
4	0	0.00
3	9	45.00
2	7	35.00
1	<u>3</u>	<u>15.00</u>
Total	20	100.00

Table 110

Recommendations Suggested by Government Officials for  
Improving the Status of Industrial Safety

Recommendations
Publish occupational safety and health rules and regulations
Train government personnel in public safety
Require industry to establish safety departments or assign a safety specialist
Train workers in industrial safety
Include industrial safety in educational and training systems



Table 110 (continued)

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Recommendations
Promote safety awareness through media
Build an occupational safety and health institute
Offer college degrees in industrial safety
Train department staff in occupational safety and health
Train and educate industrial managers
Establish an independent occupational safety and health agency
Eliminate redundancy of similar programs
Establish safety department in each ministry
Initiate safety field research
Conduct safety seminars
Publish and distribute safety pamphlets
Reinforce and support occupational health services
Train supervisors in industrial safety
Develop safety programs
Install safety equipment in public facilities
Universities and industry should cooperate to solve industrial safety problems
Provide industrial safety courses in cooperation with industry and government
Individuals and facilities should be protected
Publish industrial safety standards

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The data in Table 111 showed the opinions of interviewed officials to items that should be implemented or adopted to improve the status of industrial safety. All of the officials interviewed reported industrial safety courses should be incorporated into the educational and training systems; 95% reported that publication and distribution of industrial safety standards should be adopted or implemented to improve the status of industrial safety; 90% supported the need for implementing or adopting comprehensive record keeping and research in occupational health; 85% reported strict government control and regulations were needed; 80% reported more participation and involvement by the government was also needed; 10% reported that educational institutions should heavily participate in spreading industrial safety awareness, and 5% reported that research in accident prevention, educating the public and industrialists, and the recruiting of occupational health physicians were all needed to improve the status of industrial safety in Saudi Arabia.

Table 111

Governmental Activities to be Implemented or Adopted  
to Improve the Status of Industrial Safety

Response	Number	Percent
Strict government control and regulations	17	85.00
Publication and distribution of industrial safety standards	19	95.00
More participation and involvement by the government	16	80.00
Incorporating industrial safety courses into the educational and training systems	20	100.00
Comprehensive record keeping	18	90.00
Research in occupational health	18	90.00
Others: Encourage research in accident prevention	1	5.00
Educate public and industrialists	1	5.00
Educational institutions should participate heavily in spreading industrial safety awareness	2	10.00
Recruit occupational health physicians	1	5.00

The data in Table 112 showed the response of the officials interviewed as to which present governmental department should be responsible for managing the Kingdom Industrial Safety program or organization. The data indicated that 50% of the officials interviewed reported that the Ministry of Industry and Electricity should be responsible at the present time for managing the industrial safety function or organization, 25% reported the Civil Defense Department should, 20% reported the Ministry of Labor and Welfare

should, and only 5% reported that the Standards and Measurements Organization should manage the organization of industrial safety.

Table 112

Existing Department that Should be Responsible  
for Managing the Industrial Safety  
Program or Organization

Response	Number	Percent
Ministry of Labor and Welfare	4	20.00
Ministry of Industry and Electricity	10	50.00
Civil Defense Department	5	25.00
Standards and Measurements Organization	<u>1</u>	<u>5.00</u>
Total	20	100.00

The data in Table 113 showed the response of the officials interviewed as to favoring or recommending the establishment of a new independent industrial safety agency which indicated that 90% of the officials interviewed favored and recommended the establishment of a new independent industrial safety agency, while 10% did not.

Those who favored and recommended the establishment of an independent industrial safety agency were asked to name the departments that should cooperate and coordinate in the activities of the new agency. Their responses are shown in Table 114.

Table 113

Respondents Favoring and Recommending the Establishment of a  
New Independent Industrial Safety Agency

Response	Number	Percent
Should	18	90.00
Should not	<u>2</u>	<u>10.00</u>
Total	20	100.00

The results in Table 114 indicated that 75% of the officials interviewed mentioned the Ministry of Industry and Electricity as one of the departments that should cooperate and coordinate in the activities with the new industrial safety agency, 65% mentioned the Ministry of Labor and Welfare, 55% the Civil Defense Department, 45% the Standards and Measurements Organization, 40% the General Directorate of Technical Education and Vocational Training, 15% the Ministry of Health, 10% each the Ministry of Defense, the Ministry of Interior and Saudi Basic Industries Corporation, and 5% each for ten other ministries and organizations as shown in the table.

Those who favored and recommended the establishment of a new independent industrial safety agency were asked to name other government agencies that should only cooperate with the new agency. Their responses are shown in Table 115 which indicated that practically all other government agencies should cooperate with the new Industrial Safety Agency. Interviewed officials' responses for these organizations range from 5% to 25% of the mentioned rate.

Table 114

Organizations that Should Cooperate and Coordinate in the Activities  
of the Industrial Safety Agency

Response	Number	Percent
Ministry of Industry and Electricity	15	75.00
Ministry of Labor and Welfare	13	65.00
Civil Defense Department	11	55.00
Standards and Measurements Organization	9	45.00
General Directorate of Technical Education and Vocational Training	8	40.00
Ministry of Health	3	15.00
Ministry of Defense	2	10.00
Ministry of Interior	2	10.00
Saudi Basic Industries Corporation	2	10.00
Royal Commission for Jubail and Yanbu	1	5.00
Chambers of Commerce	1	5.00
Social Insurance Agency	1	5.00
Saudi Consulting Services Organization	1	5.00
Ministry of Housing and Public Works	1	5.00
Ministry of Petroleum	1	5.00
Water Distillation Organization	1	5.00
Educational Institutions	1	5.00
Private Industry	1	5.00
Ministry of Municipalities	1	5.00

Table 115

Organizations that Should Only Cooperate with the  
New Industrial Safety Agency

Response	Number	Percent
Universities	4	20.00
Ministry of Education	5	25.00
Ministry of Higher Education	2	10.00
Ministry of Planning	1	5.00
Ministry of Agriculture	2	10.00
Ministry of Commerce	2	10.00
Ministry of Justice	1	5.00
Ministry of Information	1	5.00
Ministry of Communication	1	5.00
Ministry of Finance	1	5.00
Saudi Airlines	1	5.00
Aramco	1	5.00
Environmental Protection Office	1	5.00
All related government agencies	4	20.00
Contractors with government	1	5.00

The data in Table 116 showed the response of the officials interviewed as to which departments or agencies of the government are presently involved, one way or another, with industrial safety.

Table 116

Government Agencies or Departments Presently  
Involved with Industrial Safety

Response	Number	Percent
Ministry of Industry and Electricity	14	70.00
Ministry of Labor and Welfare	12	60.00
Civil Defense Department	11	55.00
General Directorate of Technical Education and Vocational Training	6	30.00
Standards and Measurements Organization	5	25.00
Ministry of Health	7	35.00
Ministry of Interior	4	20.00
Ministry of Defense	2	10.00
Ministry of Housing and Public Works	2	10.00
Ministry of Commerce	3	15.00
The Royal Commission for Jubail and Yanbu	2	10.00
Ministry of Petroleum	2	10.00
Ministry of Municipalities	3	15.00
Ministry of Planning	1	5.00
Social Insurance Agency	1	5.00
Saudi Counseling Services Organization	1	5.00
Chambers of Commerce	1	5.00
Ministry of Justice	1	5.00



The data in Table 116 indicated that 70% of the officials interviewed mentioned the Ministry of Industry and Electricity as being presently involved in industrial safety, one way or another, 60% mentioned the Ministry of Labor and Welfare, 55% mentioned the Civil Defense Department, 35% the Ministry of Health, 30% the General Directorate of Technical Education and Vocational Training, 25% the Standards and Measurements Organization, 20% the Ministry of Interior, 15% each the Ministry of Commerce and the Ministry of Municipalities, 10% each the Ministries of Defense, Housing and Public Works, Petroleum, and the Royal Commission for Jubail and Yanbu. Finally, one official mentioned each of the Ministry of Planning, Social Insurance Agency, Saudi Counseling Services Organization, Chambers of Commerce, and the Ministry of Justice as being presently involved, one way or another, in industrial safety.

Table 117

Adequacy and Efficiency of the Present  
Government Industrial Safety Status

Response	Number	Percent
Adequate and efficient	2	10.00
Not adequate and efficient	<u>18</u>	<u>90.00</u>
Total	20	100.00

The data in Table 117 showed the response of the officials interviewed as to their feeling concerning whether the present status or set-up was adequate and efficient; 90% of the officials interviewed

reported that the present set-up was not adequate and efficient while only 10% reported that it was.

Table 118

What Should be Done to Improve the Present  
Status of Industrial Safety

Response	Number	Percent
Establish an independent and central governmental occupational safety and health agency authorized to control, regulate, and issue rules	14	77.78
Spread awareness through media	1	5.56
Coordination between related agencies for the application of safety codes prior to an industry's operation	1	5.56
Encourage the establishment of private safety consultant offices	1	5.56
Coordination between Civil Defense Department and the Ministry of Industry and Electricity	<u>1</u>	<u>5.56</u>
Total	18	100.00

Those officials who did not feel that the present set-up was adequate and efficient were asked to recommend what should be done. Their responses are shown in Table 118 which indicated that 77.78% of the officials who did not feel the present set-up was adequate and efficient recommended the establishment of a new independent governmental industrial safety and health agency, 5.56% each recommended spreading awareness through media, coordination between related agencies for approving safety codes prior to an industry's operation, coordination between the civil defense department and the

Ministry of Industry and Electricity, and finally, encouraging the establishment of private safety consultant offices.

The data in Table 119 showed the response of the interviewed officials to their department's accident record keeping which indicated that 80% of the officials interviewed did not keep records of accidents in their departments, while 20% did keep accident records in their department.

Table 119  
Accident Record Keeping by Departments

Response	Number	Percent
Kept records	4	20.00
Did not keep records	<u>16</u>	<u>80.00</u>
Total	20	100.00

Table 120  
Records Being Kept for the  
Department or the Kingdom

Response	Number	Percent
Department only	2	50.00
Kingdom	2	50.00

Those officials who kept records were asked if the records were for their department only or for the Kingdom. Their responses are

shown in Table 120 which indicated that of those departments who keep records, 50% kept them for their department and 50% kept them for the Kingdom.

#### Government Officials' Perceptions of Occupational Safety and Health

The data in Table 121 showed the level of agreement or disagreement of government officials interviewed regarding their perceptions of occupational safety and health. The results indicated that 35% of the interviewed officials agreed that industrial accidents are part of life and must be accepted as such by the authorities, 10% strongly agreed, 25% disagreed, 20% strongly disagreed, and 10% were neutral; 50% of the officials interviewed disagreed that many of the present day occupational illnesses with which people suffer could not have been anticipated or avoided, 20% strongly disagreed, 20% agreed, 5% strongly agreed, and 5% were neutral; 35% of the officials interviewed strongly disagreed that a monetary value can be placed on human life and safety, 35% disagreed, 10% strongly agreed, 10% agreed, and 10% were neutral; 60% of the officials interviewed strongly agreed that the benefits of safety outweigh its cost, and 40% agreed; and 70% of the officials interviewed strongly agreed that safety is the most important element of the working environment, and 30% agreed.

Table 121

Government Officials' Perceptions of Occupational Safety and Health

Statements	Levels of Agreement/Disagreement to Statements											
	SD	D	N	A	SA	T	#	%	#	%		
Industrial accidents are part of life and must be accepted as such by the authorities	4	20.00	5	25.00	2	10.00	7	35.00	2	10.00	20	100.00
Many of the present day occupational illnesses with which people suffer could not have been anticipated or avoided	2	10.00	10	50.00	1	5.00	4	20.00	1	5.00	*18	90.00
A monetary value can be placed on human life and safety	7	35.00	7	35.00	2	10.00	2	10.00	2	10.00	20	100.00
The benefits of safety outweigh its costs	0	.00	0	.00	0	.00	8	40.00	12	60.00	20	100.00

Table 121 (continued)

Statements	SD		D		N		A		SA		T	
	#	%	#	%	#	%	#	%	#	%	#	%
Safety is the most important element of the working environment	0	.00	0	.00	0	.00	6	30.00	14	70.00	20	100.00

Note. SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree;

T = Total; # = Number; % = Percent.

\* Two did not respond.

Government Officials' Perception of the Adequacy of Private Industry's  
Concern with Industrial Safety

Table 122 showed the level of agreement or disagreement of government officials interviewed regarding their perception of industry's concerns with industrial safety. The data indicated that 45% of the officials interviewed disagreed that private industry is adequately concerned with industrial safety, 20% strongly disagreed, 15% agreed, and 20% were neutral.

Table 122

Level of Agreement/Disagreement with the Statement:  
Private Industry is Adequately Concerned  
with Industrial Safety

Response	Number	Percent
Strongly disagree	4	20.00
Disagree	9	45.00
Neutral	4	20.00
Agree	3	15.00
Strongly agree	<u>0</u>	<u>0.00</u>
Total	20	100.00

Government Officials' Perceptions of the Government Activities and  
Responsibilities for Industrial Safety

The data in Table 123 showed the level of agreement or disagreement of the interviewed government officials' perception

regarding the activities and responsibilities of the government toward occupational safety and health.

The results in Table 123 indicated that 65% of the officials interviewed agreed that it is the responsibility of the government to develop and implement an industrial safety program for Saudi industry, 25% strongly agreed, 10% either disagreed or were neutral to the statement; 65% of the officials interviewed agreed that promoting the safety program using all promotional activities and means available is essential for its implementation and acceptance by industry, and 35% strongly agreed; 55% of the officials interviewed strongly agreed that an industrial safety program is needed, 35% agreed, 10% either disagreed or were neutral to the statement; 35% of the officials interviewed disagreed that the government presently is doing an adequate job in preventing industrial accidents, 5% strongly disagreed, 10% agreed, 5% strongly agreed, while 45% were neutral; and 45% of the officials interviewed agreed that there are presently too many industrial accidents taking place in the Kingdom, 10% disagreed while 45% were neutral.



Table 123  
 Government Officials' Perceptions of the Government's Activities  
 and Responsibilities for Industrial Safety

Statements	Levels of Agreement/Disagreement to Statements											
	SD	D	N	A	SA	T	#	%	#	%		
It is the responsibility of the government to develop and implement an industrial safety program for Saudi industry	1	5.00	0	.00	1	5.00	13	65.00	5	25.00	20	100.00
Promoting the safety program using all promotional activities and means available is essential for its implementation and acceptance by industry	0	.00	0	.00	0	.00	13	65.00	7	35.00	20	100.00
An industrial safety program is needed	1	5.00	0	.00	1	5.00	7	35.00	11	55.00	20	100.00

Table 123 (continued)

Statements	SD		D		N		A		SA		T	
	#	%	#	%	#	%	#	%	#	%	#	%
The government presently is doing an adequate job in preventing industrial accidents	1	5.00	7	35.00	9	45.00	2	10.00	1	5.00	20	100.00
There are presently too many industrial accidents taking place in the Kingdom	0	.00	2	10.00	9	45.00	9	45.00	0	.00	20	100.00

Note. SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree; T = Total; # = Number; % = Percent.

The interviewed government officials were asked to provide accident data for the last two years--1980 and 1981--and to indicate if the data were from records or estimates. Their responses are shown in Tables 124, 125, 126 and 127. The data in Tables 126 and 127 provided information concerning accidents for the Kingdom while the data in Table 125 provided information concerning accidents for the departments.

Table 124  
Source of Accident Data

Response	Number	Percent
Records	3	15.00
Estimates	1	5.00
No answer	<u>16</u>	<u>80.00</u>
Total	20	100.00

The results in Table 124 showed that 15% of the officials interviewed provided data from records, 5% from estimates, and 80% did not provide any data at all. The data in Table 125 provided numbers and types of injuries for two educational institutions. The two institutions enrolled between 1,000 and 1,500 students a year and performed the same functions.

Table 125  
Type and Number of Accidents  
for Departments

Response	Records		Estimates		Total	
	1980	1981	1980	1981	1980	1981
Number of work-related injuries	25	18	800	900	825	918
Number of work-related injuries without lost work days	6	4	600	750	606	754
Number of work-related injuries with lost work days	19	14	200	150	219	164
Number of work-related illnesses	5	3	250	350	255	353
Number of work-related illnesses without lost work days	0	0	200	250	200	250
Number of work-related illnesses with lost work days	5	3	50	100	53	103
Number of disabling work injuries (no longer able to perform previous job)	0	0	0	0	0	0
Number of fatal injuries (work-related)	0	0	0	0	0	0

The data in Table 126 showed the types and injuries provided by the Ministry of Labor for the year 1980. The Ministry's official indicated that these accidents were reported by industry. Accident reporting by industry was and is done voluntarily and at the present there is no system of enforcing or assuring accident reporting.

The official strongly believed that the accident numbers shown in Table 126 only represented one-fourth to one-third of the actual number of accidents taking place in the Kingdom. The data in Table 127 showed the Civil Defense Department recorded numbers and types of accidents for the Kingdom.

Table 126

Type and Number of Accidents Provided by the  
Ministry of Labor and Welfare for 1980

Type of injury	Number
Minor work-related injuries	1114
Partial disabling work injuries	1444
Total disabling work injuries	229
Fatal injuries/deaths	362
Total work force	560,109

Table 127

Civil Defense Department Recorded Number and Type  
of Accidents in Rescue and Fire Operations

Types of accidents	1980	1981
Minor burns and injuries	416	383
Serious burns and injuries	430	378
Deaths	1087	780

Responses to Questions Common Only to Officials of the  
Administrative Branches of the Government

The data in Table 128 showed the response of the interviewed officials as to incorporating human resources development in their department's future plans which indicated that 100% of the officials interviewed had incorporated human resources development in their department's future plans.

Table 128

Incorporating Human Resources Development  
within Department's Future Plans

Response	Number	Percent
Incorporated	10	100.00
Not incorporated	<u>0</u>	<u>.00</u>
Total	10	100.00

The data in Table 129 showed the response of the officials interviewed regarding the major elements of their plan which indicated that 90% of the officials interviewed mentioned training as one of the major elements of their development plan, 40% mentioned education/higher education, and 20% each mentioned building more training centers and recruiting qualified personnel. The data also showed that 10% of the officials interviewed mentioned developing occupational safety and health rules and regulations, reducing occupational illness, promoting and increasing awareness, and coordinating with other agencies.

Table 129  
Major Elements of Departments' Development Plans

Response	Number	Percent
Training	9	90
Education/higher education	4	40
Develop occupational safety and health rules and regulations	1	10
Reduce occupational illness	1	10
Promote and increase awareness	1	10
Build more training centers	2	20
Coordinate with other agencies	1	10
Recruit qualified personnel	2	20

Table 130  
Inclusion of Development and Preservation of Human Resources in Departments' Plan

Response	Number	Percent
Included	8	80.00
Not included	<u>2</u>	<u>20.00</u>
Total	10	100.00

The data in Table 130 showed the response of the interviewed officials to the inclusion of developing and preserving human

resources in their plan which indicated that 80% of the interviewed department officials have included developing and preserving the human resources in their plans while 20% did not.

The data in Table 131 showed the response of the interviewed officials who had included developing and preserving human resources in their plan. All of the officials mentioned training as one of the major elements of their human resource development, 37.50% mentioned education, 25% recruitment, 12.50% each for research, increasing incentives, proper placement, improve educational facilities, and provision and enforcement of safety equipment use.

Table 131  
Major Elements of Departments' Human Resources Plan

Response	Number	Percent
Training	8	100.00
Education	3	37.50
Recruitment	2	25.00
Research	1	12.50
Increase incentives	1	12.50
Proper placement	1	12.50
Improve educational facilities	1	12.50
Provision and enforcement of safety equipment use	1	12.50



The data in Table 132 showed the response of the interviewed officials to the inclusion of accident prevention programs as one of the plan's elements which indicated that 70% of the interviewed department officials had included accident prevention programs in their plans while 30% had not.

Table 132  
Inclusion of Accident Prevention in  
Departments' Plan

Response	Number	Percent
Included	7	70.00
Not included	<u>3</u>	<u>30.00</u>
Total	10	100.00

Table 133  
Provision of an Education or Training Program  
by Departments

Response	Number	Percent
Provided	7	70.00
Not provided	<u>3</u>	<u>30.00</u>
Total	10	100.00

The data in Table 133 showed the response of the interviewed officials to provision of an educational or training program of any

type. The data indicated that 70% of the officials interviewed had an educational or training program in their departments while 30% did not.

Those officials who provided an educational/training program were asked to identify the type of the program. Their responses are shown in Table 134 which indicated that 14.29% of the officials interviewed offered Civil Defense, labor relations, safety and health, vocational, measurements and standards, and English training or educational programs by their departments. The table also showed that 42.86% of the departments provided administration training or educational programs while 28.58% offered seminars.

Table 134

Types of Educational/Training Programs  
Offered by Departments

Types of Programs	Number	Percent
Civil defense	1	14.29
Labor relations	1	14.29
Safety and health	1	14.29
Administration	3	42.86
Vocational	1	14.29
Measurements and standards	1	14.29
English	1	14.29
Seminars	2	28.58

The data in Table 135 showed the response of the officials interviewed as to the responsibility of their departments for inspecting industrial facilities which indicated that 70% of the officials interviewed had responsibilities of inspecting some industrial facilities, while 30% did not have such responsibility.

Table 135  
Departments Responsible for Inspecting  
Industrial Facilities

Response	Number	Percent
Responsible	7	70.00
Not responsible	<u>3</u>	<u>30.00</u>
Total	10	100.00

Table 136  
Availability of Written Inspection Standard Procedures

Response	Number	Percent
Available	4	57.14
Not available	<u>3</u>	<u>42.86</u>
Total	7	100.00

The data in Table 136 showed the response of the officials interviewed to the availability of written standard procedures of inspection for their inspectors to follow which indicated that 57.14%

of those officials whose departments were responsible for inspecting some industrial facilities had written standard procedures of inspection for their inspectors to follow, while 42.86% did not have written inspection procedures.

The data in Table 137 showed the response of the officials interviewed about the application of corrective measures in cases of safety violations which indicated that 57.14% of those officials whose departments were responsible for inspecting some industrial facilities did apply or take corrective measures in cases of safety violations, while 42.86% did not.

Table 137  
Application of Corrective Measures in Cases  
of Safety Violations

Response	Number	Percent
Applied	4	57.14
Did not apply	<u>3</u>	<u>42.86</u>
Total	7	100.00

Responses to Questions Common Only to Officials of the  
Educational/Institution Branches of the Government

The data in Table 138 showed the response of the officials interviewed to the availability in their institutions of an identifiable industrial safety management/engineering curriculum which indicated that none of the interviewed officials' institutions had an identifiable industrial safety management/engineering curriculum.

Table 138

Availability of an Identifiable Industrial Safety  
Management/Engineering Curriculum

Response	Number	Percent
Available	0	.00
Not available	<u>10</u>	<u>100.00</u>
Total	10	100.00

The data in Table 139 showed the response of the officials interviewed as to the inclusion of industrial safety management/engineering in any certified program of study which indicated that 90% of the interviewed officials' institutions did not include industrial safety management/engineering in any certified programs of study. Only 10% of the officials' institutions did include safety in their programs.

Table 139

Inclusion of Industrial Safety Management/Engineering  
in a Certified Program of Study

Response	Number	Percent
Included	1	10.00
Not included	<u>9</u>	<u>90.00</u>
Total	10	100.00

The data in Table 140 showed the response of the officials interviewed as to the availability of an identifiable course of study offering any area of accident prevention--technical or non-technical--in any of their study programs. The results indicated that 60% of the officials interviewed had an identifiable course of study offering any area of accident prevention--technical or non-technical--in their study programs while 40% did not.

Table 140  
Availability of Accident Prevention Studies  
in any Course of Study

Response	Number	Percent
Available	6	60.00
Not available	<u>4</u>	<u>40.00</u>
Total	10	100.00

Those officials whose institutions had an identifiable course of study that offered any area of accident prevention were asked to identify the title(s) of the course(s). Their responses are shown in Table 141 which indicated that 50% of the interviewed officials whose institutions had an identifiable course of study that offered any area of accident prevention had it as part of some engineering, management, and industrial psychology courses, 33.33% had such courses as elementary industrial safety training courses, and 16.67% had an identifiable course in industrial safety as part of the mechanical engineering degree program.

Table 141

Course(s) Title(s) that Included Some Areas  
of Accident Prevention

Response	Number	Percent
As part of engineering, management, and industrial psychology courses	3	50.00
Elementary training courses in industrial safety	2	33.33
An industrial safety course as part of the mechanical engineering degree	<u>1</u>	<u>16.67</u>
Total	6	100.00

#### ANALYSES AND INTERPRETATIONS OF THE MAJOR FINDINGS

In the following pages an analysis and interpretation of the major findings of the study will be presented. In the survey part each of the basic elements of the industrial safety program will be presented. Additionally, analyses and interpretations of the major findings of the general support information section will also be included. The second part of this section will include the analyses and interpretations of the findings from the interview with the officials of the government.

## The Survey

### Management Leadership

The questionnaire of this section showed that the great majority of organizations, 91%, considered industrial safety as an organizational objective. However, 75% had no written safety policy, 94% had no safety department, 73% had not defined accident prevention responsibilities in writing, over 50% never conducted safety meetings with subordinates, over 50% had no accident records, over 70% never prepared accident analysis reports of any kind, and over 59% never provided safety rules or procedures to different levels of their organization. The results revealed that 67% assigned accident prevention as part-time of someone's job of which 40% were 10% or less of their jobs. Only 26% of the organizations had top management responsible and accountable for safety, and 17% considered amputation as the most severe accident while 34% considered cuts, lacerations, punctures, and abrasions as the most severe types of accidents.

The results of the survey indicated that the majority of industrial organizations in Saudi Arabia have not developed a firm and written safety policy concerning safety and the responsibility of management for its operation. This was illustrated further by neither defining accident prevention in writing, nor providing safety rules or procedures to different levels of the organization. The results also showed insufficient management interest or direction along with a failure to participate in meetings and prepare or have analysis reports prepared for them. Another lack of interest and concern was



demonstrated by assigning the responsibility of accident prevention as a part-time responsibility. A further deficiency of interest was demonstrated in their failure to identify the most severe types of injuries by the majority of the organizations.

#### Accountability and Assignment of Responsibility

The questionnaire results of this section showed that most of the organizations, 42% and 18%, relied on verbal means of assigning and not assigning, respectively, accident prevention responsibilities to supervisors; 50% relied on oral feedback from supervisors as a means of verification while 26% did not verify at all that supervisors understood their accident prevention responsibilities, and 63% gave verbal warning while 12% did nothing to supervisors who failed to correct unsafe practices.

The survey also revealed that over 54% of the organizations did not counsel supervisors on safety performance, over 52% did not make follow-ups with supervisors who had poor safety records, 69% did not include supervisors' safety records in performance review, and over 55% did not assess supervisors' safety attitudes or performance. Only 22% of the organizations delegated the authority of enforcing safety rules within the plant area to supervisors. A final finding showed that 92% of the organizations encouraged receiving safety recommendations from workers, but 42% related their responses to receiving recommendations from management personnel.

This section of the survey indicated a lack of knowledge of management responsibility and function by most organizations. There

was a deficiency of discussion and direction by top management to lower echelons of the organization. The assigning and delegating of responsibility, authority, and accountability were based on verbal means. Management demonstrated insufficient knowledge of the supervisor's role in the organization. An important result of this section of the questionnaire was the obvious deficiency of discussion, recognition, supervision, and participation by management with the lower levels of their organizations.

### Training

The questionnaire results of this section showed that 64% of the organizations' supervisors were not trained in accident prevention techniques, 79% did not require supervisors to attend safety training courses, and 80% indicated the unavailability of training institutions in industrial safety.

This section also showed that 49% of the organizations did not provide accident prevention training for new employees, and of those who did, 38% had supervisors perform the training, 83% of the training was on the job training, only 4% performed training in a formal setting, and 39% of the organizations' supervisors did not include in their initial orientation training of new employees discussion of rules and procedures of safe work practices.

It was revealed that only 19% of the organizations who had job descriptions included in them safe work practices and a list of personal protective equipment, but 62% of the organizations had never prepared job descriptions at all. The majority, 95% of the

organizations, have provided personal protective equipment to their employees and 85% of them enforced their use, but 52% did not have a program for maintaining the equipment.

Finally, this section showed that 75% of the organizations' supervisors were not provided with a list of unsafe work practices or conditions that apply to each job, 76% had not instructed their employees in occupational hygiene, 55% allocated less than 5% of their training costs to safety training, and 38% allocated none.

The most important finding of this section indicated a deficiency in safety training for supervisors and a deficiency in even making safety training an organizational requirement by most of the organizations. Another finding revealed perhaps a weak area of safety training where new employees were not trained by supervisors. In those organizations where supervisors performed the initial orientation training of new employees, discussions of rules and procedures of safe work practices were never included in the training. This would have been the time best suited for establishing safe practices and preventing unsafe habits.

Another important finding revealed the inadequacy of neither preparing job descriptions nor providing supervisors with a list of unsafe practices or conditions that apply to each job by most organizations.

This section revealed that most organizations underestimated the importance of training. They demonstrated lack of interest and concern for developing their employees' skills and the proper attitudes that promote or help in preventing accidents.

### Accident Reporting and Recording

The questionnaire results of this section showed that 70% of the organizations did not keep records on work-related injuries, 82% did not keep records on lost work time, 80% did not keep records on accident costs, and 62% of the organizations' supervisors never provided management with injury summary reports.

The section also showed that 36% of the organizations did not investigate accidents immediately after their occurrence, 22% had supervisors perform the investigation, and 52% had plant, personnel, administration managers, supervisors, and no one as the highest management representative to review the investigation reports.

The results of this section revealed that 65% of the organizations required their employees to report potential hazards, but 76% of the reportings were verbal and 37% of the organizations gave no incentive for reporting potential hazards.

In providing numbers of work-related injuries, 69% of the organizations estimated these numbers, 14% provided them from records, and 17% did not provide any. The provided numbers of injuries--both estimated and recorded--revealed an increase of 36% in the number of accidents from 1980 to 1981.

The most important finding of this section indicated that the majority of the organizations surveyed did not keep records on work-related injuries, lost work time, cost of accidents, and their supervisors never provided management with injury summary reports.

Another important finding revealed that over one-third of the organizations did not investigate accidents immediately after their

occurrence, less than one-fourth had supervisors perform the investigation, and over half of the organizations did not have top management review the investigation reports.

Although the greater majority of the organizations did not keep records of accidents, most of them provided estimates of the number of accidents that took place in 1980 and 1981. The results showed an increase of 36% in the number of accidents from 1980 to 1981.

This section of the questionnaire indicated the lack of responsibility by top management in accepting their duty to keep records which is the most basic element of an accident prevention program. Management demonstrated an insufficient interest or responsibility in accepting and acknowledging their duty to review reports and demand periodic summaries of injury reports in order to establish plans to reduce and control the incidence of industrial accidents.

### Physical Surveys

The questionnaire results of this section showed that 73% of the organizations conducted routine safety inspections of their facilities. The individuals who performed the inspections ranged from the general manager down the line to the store keeper and the plant physician. It was also shown that 70% performed the inspections daily and/or weekly, but 80% of the organizations' inspectors were not specifically trained in inspection techniques and procedures. Finally, 40% of the organizations reported that no one reviews the inspection reports and those who did had the general, plant,

administration, production and personnel managers review the inspection reports.

The answers to questions in this section indicated that while the over-all concern is higher than concerns in previous areas, there were no clearly established procedures nor clearly defined requirements for the reporting of unsafe conditions. This was demonstrated by the absence of specific training of inspection techniques and skills for the inspectors. The findings of this section indicated a deficiency of responsibility on the part of management to review the inspection reports and direct corrective actions.

#### Medical Support

The questionnaire results of this section showed that 94% of the organizations had first-aid materials available in their facilities, 80% inspected them periodically, but 64% had no written procedures for their replenishments, and 85% had someone in the organization responsible for replenishing first-aid material and they ranged from the general manager down the ladder to include foremen, store keepers, and nurses.

The section also showed that 76% of the organizations did not have an in-house nurse/doctor, 88% did not have medically trained personnel in the facilities, 47% did not have either an in-house nurse/doctor or a nurse/doctor on call, and 36% did not have an in-house nurse/doctor, nurse/doctor on call, or medically trained personnel in the organization.

It was also revealed that 81% of the organizations did not have a first-aid room in the facility, 82% had no assigned vehicles to carry injured persons to hospitals, 74% did not keep logs of first-aid/medical treatments, and 42% did not give pre-employment physical examinations. Finally, it was shown that 75% of the organizations instructed their employees as what to do in case of an accident or emergency, but 73% had no evacuation plan in the event of a life threatening emergency.

The answer to the first question of this section indicated that the great majority of organizations had first-aid materials available in their facilities. The most revealing finding of this section was the absence of medically trained personnel in industrial facilities by the majority of organizations surveyed. This indicates management's inadequacy of responsibility and concern for its employees. Almost half of the organizations did not have either an in-house nurse/doctor or have one on call. The worst case was demonstrated by over one-third of the organizations where they did not have an in-house nurse/doctor, medically trained personnel in the facility, or a nurse/doctor on call.

Another important finding was that the majority of the organizations did not have assigned vehicles to carry injured persons to hospitals. More than half did not give pre-employment physical examinations.

Other findings of this section clearly revealed management's deficiency in organizing, controlling, and directing the safety functions in most of the organizations surveyed. This was

demonstrated by the majority of organizations who had no written procedures for replenishing first-aid materials, did not keep logs of first aid/medical treatment, and no evacuation plans in case of a life threatening emergency.

### Motivation

The questionnaire results of this section showed that 92% of the organizations did not conduct safety contests in their organizations, 94% did not show safety films to their employees, 62% did not have safety posters in the plant area of their facilities, and 84% did not give rewards to outstanding employees when safety goals were met. These findings indicated a clear inadequacy of management activities in motivating workers in safety and promoting safe work habits by the majority of the organizations surveyed.

### General Support Information

The questionnaire results of this section showed, on a scale from 1 to 10 (1 = low; 10 = high), that 39% of the organizations ranked themselves in the upper half of the scale 6-10, 61% ranked themselves in the lower half of the scale 1-5 as to their safety activities, and 86% welcomed assistance in improving or developing a safety program for their organizations. This was an acknowledgment by most organizations of their deficiencies and insufficient activities and involvements in industrial safety.



Industries' perceptions of government supports and activities.

The questionnaire results of those questions that relate to government supports showed that 92% of the organizations surveyed wanted the government to develop and implement an industrial safety program for Saudi Industries, 95% wanted the government to adopt and promote industrial safety rules and regulations, 91% wanted the government to provide them with assistance in developing industrial safety programs, 98% wanted the government to publish and provide industry with copies of industrial safety standards, 94% wanted the government to provide and offer, free of charge, industrial safety training courses at local schools and training centers, and 78% reported there was an absence of a government agency that could provide industry with assistance in preventing industrial accidents.

These findings indicated that industries perceived a lack of government support to industry in the area of industrial safety. It is evident from the results that the great majority of industries indicated this lack of support by the government.

The questionnaire results of those questions that relate to government activities showed that 64% of the organizations surveyed reported that the government did not have an adequate industrial safety program, 77% reported that the government did not provide them with written industrial safety rules and regulations, 80% reported that the government did not enforce these rules and regulations, 84% wanted the government inspectors to visit them at least once a year, 89% wanted the government inspectors to make follow-up visits to insure the corrections of safety violations, 83% wanted the government

inspectors to give citations for uncorrected violations, 55% reported that government inspectors were not adequately trained in industrial safety practices and they never provided industry with professional safety recommendations, 79% reported the absence of government control in industrial safety matters, 77% reported the absence of government rules and regulations regarding industrial safety, and 73% reported that the government is not doing an adequate job in preventing industrial accidents.

The findings indicated that the government either did not have an adequate industrial safety program or is not doing an adequate job of preventing industrial accidents. There was an agreement by most of the industries surveyed that the government activity in industrial safety is minimal.

Industries' perceptions of occupational safety and health. The questionnaire results of this section showed that 84% of the organizations surveyed reported industrial accidents reduced their efficiency and increased their costs, 50% reported that industrial accidents were not part of life and must not be accepted as such by management, 55% reported that many of the present day occupational illnesses could have been anticipated and avoided, 53% reported a monetary value cannot be placed on human life and safety, 80% reported that the benefits of safety outweigh its cost, and 87% reported that safety is the most important element of the working environment. The results of the questionnaire of this section indicated an insufficient awareness, by almost half of the organizations, about the basic

principles of safety regarding the value of human life, anticipation and avoidance of present day illnesses and if accidents were part of life or not.

The findings of this section indicated that the majority of the organizations surveyed acknowledged the importance of industrial safety in working environments, that its benefits outweigh its cost, and that accidents reduced their efficiency and increased their operating costs.

In summary, the findings of this last section of the questionnaire--general support information--indicated that logic, to Saudi industries, dictates that accidents are bad and safety is good. The organizations surveyed demonstrated more openness and were candid about their opinions. The majority indicated what government supports and activities were needed and what were lacking. They also indicated the need for rules, regulations, and control.

### The Interview

#### Officials of Administrative and Educational Branches

The results of the interview of this section showed that 30% of the officials interviewed said their departments were not involved in activities regarding industrial safety, 30% had no future plans in industrial safety, 60% did not provide safety training for their employees, 80% did not offer any formal courses in industrial safety, 65% did not cooperate or coordinate efforts to introduce or incorporate industrial safety into school curriculums, 80% did not

keep accident records, and all the officials suggested recommendations for improving the status of industrial safety in Saudi Arabia.

The interview results showed that 85% of the officials approved the implementation or adoption of strict government control and regulations, 95% approved the implementation or adoption of publishing and distributing industrial safety standards, and 80% approved that more participation and involvement by the government was needed. All of the officials approved incorporating industrial safety courses into the educational and training systems, 90% approved the need for comprehensive record keeping, and 90% indicated that research in occupational health was needed.

In regard to which present department should be responsible for managing the industrial safety function, 50% said the Ministry of Industry and Electricity, 25% the Civil Defense Department, 20% the Ministry of Labor, and 5% the Standards and Measurements organization. However, 90% of the officials favored and recommended the establishment of a new independent industrial safety agency. Additionally, the majority of the officials recommended that the Ministries of Industry and Electricity, Labor and Welfare, the Civil Defense Department, the Standards and Measurements Organization, and the General Directorate of Technical Education and Vocational Training should cooperate and coordinate the industrial safety activities with the new agency. In regard only to cooperation, the majority mentioned universities, Ministry of Education, and all related government agencies.

In respect to what agencies or departments of the government are presently involved, one way or another, in industrial safety, the officials mentioned 18 ministries, departments, and agencies, but the majority mentioned the Ministries of Industry and Electricity, Labor and Welfare, Health, the Civil Defense Department, the General Directorate of Technical Education and Vocational Training, and the Standards and Measurements Organization. However, 90% of the officials reported that this set-up was not adequate nor efficient, and 78% of them recommended the establishment of an independent and central governmental occupational safety and health agency authorized to control, regulate and issue rules, as the only alternative.

The findings of this section of the interview indicated that the majority of the departments were not training their employees in industrial safety nor offering formal courses. Among the most important findings of this section were the consensus among the great majority of officials in stressing the need for implementing or adopting strict government control and regulations, publishing safety standards, increasing participation and involvement by the government, incorporating industrial safety courses into the educational and training systems, and needing research in occupational health. The findings indicated a need for the elimination of redundancy, duplication, and waste of efforts, and for establishing an independent and central industrial safety agency authorized to control, regulate, and issue rules.

Government officials' perceptions of occupational safety and health. The result of the interview of this part of this section showed that 45% of the officials interviewed reported that accidents were not part of life and must not be accepted as such by management, 70% reported that present day occupational illness could have been anticipated and avoided, 70% reported that a monetary value cannot be placed on human life and safety, 100% reported that the benefits of safety outweigh its cost, and 100% reported that safety is the most important element of the working environment.

The results of the interview indicated insufficient awareness by most of the officials that accidents were part of life and must be accepted as such by management. Results of the interview regarding the anticipation and avoidance of present day illnesses and placing a monetary value on human life indicated insufficient awareness by some of the officials. There was a consensus among the officials regarding the benefits of safety versus the cost and that safety was an important element in the working environment.

Government officials' perception of the adequacy of private industry's concern with industrial safety. The results of the interview of this section showed that 65% of the officials interviewed reported that industry was not adequately concerned with industrial safety. Although the percentage was not high, this was due to the type of activities in which the interviewed officials were involved. Half of them were educators and their connections to industry were very limited. From that point of view, this finding could be

considered important and that industry's concern with industrial safety was not adequate. Results of the survey supported this interpretation.

Government officials' perceptions of the government activities and responsibilities for industrial safety. The results of the interview of this section showed that 90% of the officials interviewed reported it was the responsibility of the government to develop and implement an industrial safety program for Saudi industry, 100% reported that promoting the safety program using all promotional activities and means was essential for its implementation and acceptance by industry, 90% reported that an industrial safety program was needed, 40% reported that the government presently was not doing an adequate job in preventing industrial accidents while 45% were neutral, and 45% reported that there were presently too many industrial accidents taking place in the Kingdom while 45% were neutral.

The findings of this section indicated, by the great majority of officials, the need for an industrial safety program that should be promoted using all promotional activities and means to insure its implementation and acceptance by industry, and that the government should be responsible for developing and implementing the industrial safety program. Regarding the government adequacy in preventing accidents and the number of industrial accidents presently taking place in the Kingdom, the officials demonstrated either a lack of

knowledge to both statements or they did not want to acknowledge their lack of responsibility.

#### Officials of Administrative Branches

The results of the interview of this section showed that 100% of the officials interviewed had incorporated human resources development in their plans. Training and education were two of the major elements of the majority of these plans. Developing and preserving the human resources were also part of the majority of these plans and were done through training. The results also showed that 70% of the departments had included accident prevention programs in their plans, 70% provided some type of educational/training programs, 70% had responsibilities of inspecting some industrial facilities, 57% had written inspection procedures, and 57% applied corrective measures in cases of safety violations.

In respect to planning, the departments' officials demonstrated a sense of awareness to the problem of human resources development. Training and education were key factors in their plans. Other findings, such as including accident prevention programs, by those who indicated that, seemed they were in the planning phase or that plans needed to be implemented. Results of previous interview questions supported this interpretation.

In regard to the responsibility of inspecting industrial facilities, over two-thirds indicated this responsibility. However, only three departments had the responsibility of inspecting private industry while the rest were government industries. Almost half of



the departments had no written inspection procedures nor did they take corrective actions in cases of safety violations. Results from the survey suggested insufficient inspections and insufficient corrective actions in the majority of the cases.

#### Officials of Educational/Institution Branches

The results of the interview of this section showed that 100% of the interviewed officials' institutions did not have an identifiable industrial safety management/engineering curriculum, and 90% did not include industrial safety management/engineering in any certified program of study. Only 60% of the institutions had an identifiable course of study offering an area of accident prevention--technical or non-technical--in any of their programs of study.

The most important findings of this section indicated the real need for including industrial safety courses in the educational and training systems of the Kingdom. The results indicated a lack of such courses.

CHAPTER V  
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The Problem

The problem of this research was to determine the present industrial safety measures in selected Saudi Arabian industries, and to determine the status of government activity and involvement in industrial safety.

The Purpose

The main purpose of this research was to make recommendations which might help the Saudi authorities as they plan and work toward solving the problem of increasing the availability of national manpower through effective industrial safety programs. More specifically, answers to the following questions were sought:

1. How does management in Saudi Arabian industry show leadership for accident prevention?
2. How does management hold lower echelons accountable for accident prevention in Saudi industry?
3. What safety training does management provide for workers in Saudi industry?
4. What systems of accident reporting and recording are practiced by Saudi industry?

5. How often are physical surveys of plant facilities conducted and who is responsible for them in Saudi industry?
6. What medical support systems are employed in Saudi industry?
7. What safety motivational activities does management promote in Saudi industry?
8. What industrial safety measures are currently being practiced by the Saudi government for preventing industrial accidents?

#### Procedures of the Research

The procedural methods that were incorporated in this research covered the following areas:

1. An intensive review of literature was conducted concerning the management principles and theories of industrial safety programs.
2. Two data collection instruments were designed. The questionnaire was designed to determine: (a) the status of industrial safety procedures, (b) the practices of management regarding safety, and (c) the extent of management acceptance of responsibility for industrial safety in accordance with the basic elements of any safety program. The second instrument was the interview and was designed to determine the status of government activities and to evaluate the extent of the government's involvement, practice and responsibility for industrial safety.
3. The questionnaires were personally delivered to 119 industries and collected personally from 103 industries--a return rate of 86.6%.

4. Interview sessions were held with 20 government officials in both administrative and educational branches of the government.

### Survey Findings

#### Management Leadership

The results of the survey indicated that the majority of industrial organizations have not developed a firm and written safety policy that defines the responsibility of management for its operation. This was illustrated further by neither defining accident prevention in writing nor providing safety rules or procedures to different levels of the organization. An insufficient management interest or direction along with a failure to participate in safety meetings and prepare or have analysis reports prepared for them was indicated. A less than adequate interest and concern was demonstrated by assigning the responsibility of accident prevention as a part-time function rather than a full-time responsibility. An insufficient knowledge was demonstrated in management's failure to identify the most severe types of injuries by the majority of the organizations.

#### Accountability and Assignment of Responsibility

The results of the survey indicated a lack of knowledge of management responsibility and function by most organizations. There was a lack of discussion and direction by top management to lower echelons of the organization. The assigning of and delegating of responsibility, authority, and accountability were based on verbal

means. Management also demonstrated insufficient knowledge of the supervisor's role in the organization. An important result of this section was the obvious deficiency of discussion, recognition, supervision, and participation by management with the lower levels of their organizations.

### Training

The results of the survey indicated a deficiency in safety training for supervisors and a deficiency in making safety training an organizational requirement by most of the organizations. Another result indicated the inadequacy of job descriptions and of providing supervisors with a list of unsafe practices or conditions that apply to each job by most organizations.

### Accident Reporting and Recording

The results of the survey indicated that the majority of the organizations did not keep records on work-related injuries, lost work time, cost of accidents, and injury summary reports. Estimates of the number of accidents were provided for the years 1980 and 1981 and these numbers showed an increase of 36% in the number of accidents from 1980 to 1981.

The results from this section of the study revealed the lack of responsibility by top management in accepting their duty to keep records which is one of the most basic elements of an accident prevention program. The results indicated an insufficient interest or responsibility by management in accepting and acknowledging their duty

to review reports and demand periodic summaries of injury reports in order to establish plans to reduce and control the incidence of industrial accidents.

#### Physical Surveys

The results of the survey indicated that there were no clearly established procedures and clearly defined requirements for the reporting of unsafe conditions. Most of the organizations surveyed reported the absence of specific training of inspection techniques and skills for the inspectors. The findings of this section indicated a deficiency of responsibility on the part of management to review the inspection reports and direct corrective actions.

#### Medical Support

The results of the survey indicated the absence of medically trained personnel in industrial facilities by the majority of the organizations. They did not have an in-house nurse/doctor, medically trained personnel in the facility, or a nurse/doctor on call. Also the majority of the organizations did not have assigned vehicles to carry injured persons to hospitals, and more than half did not give pre-employment physical examinations. These findings may indicate management's lack of responsibility and concern for its employees.

Other findings of this section revealed management's deficiency in organizing, controlling, and directing the safety function in most of the organizations surveyed. This was demonstrated by the majority of organizations who had no written procedures for replenishing

first-aid materials, who did not keep logs of first aid/medical treatment, and who did not have evacuation plans in case of a life-threatening emergency.

### Motivation

The results of the survey indicated a lack of management activities in motivating workers in safety and promoting safe work habits by the majority of organizations. The findings indicated that most of the organizations did not conduct safety contests, show safety films, use safety posters, or give rewards to outstanding employees when safety goals were met.

### General Support Information

The results of the survey indicated the acknowledgment by most organizations of their insufficient activity and involvement in industrial safety. Another finding indicated an insufficient awareness, by almost half of the organizations, about the basic principles of safety.

In regard to government supports and activities in industrial safety, the majority of the organizations indicated a lack of government support and activity. The majority of the organizations indicated the need for rules, regulations, and control.

### Interview Findings

In respect to planning, the results of the interview indicated that the officials demonstrated a sense of awareness to the problem of

human resources development. Training and education were reported as key factors in their plans. In respect to the inclusion of accident prevention programs, the results indicated that the government agencies were in the planning phase or that plans needed to be implemented to accomplish this goal.

There was a consensus among the majority of officials in stressing the need for strict government control and regulations, publishing safety standards, more participation and involvement by the government, incorporating industrial safety courses into the educational and training systems, and the need for research in occupational health. Another result indicated a need for the elimination of redundancy, duplication, and waste of effort, and for establishing an independent and central industrial safety agency authorized to control, regulate, and issue rules.

Other results of the interview indicated that almost half of the departments had no written inspection procedures nor did they take corrective actions in cases of safety violations; that the majority did not keep accident records; and there was insufficient awareness by some of the officials regarding the basic principles of safety. Finally, the results indicated a real need for including industrial safety courses in the educational and training systems of the Kingdom; that the present governmental involvement in safety was not adequate; and that a need for a government industrial safety program exists.



## CONCLUSIONS

The responsibility for reducing accidents and industrial injuries rests largely in the hands of management. As in any management activity, a safety program must implement management principles of authority, delegation, controls to measure performance, and accountability. These principles of management are essential to production, marketing, and distribution of work load, and, similarly, should be applied to accident prevention. If properly applied, the basic elements of a safety program, as were mentioned in chapters two and three, would formulate the foundation of management responsibility for safety.

An effective accident prevention program is dependent upon top management's acceptance of its responsibility. In order to demonstrate this responsibility, a need for a firm written safety policy defining the responsibilities at each level of management must be formulated and implemented. In order to hold various levels of management accountable for accident prevention, it is important that top management be informed as to the type, cause, frequency, and costs of industrial injuries. Such information should form the basis for planning, implementing, and monitoring an effective safety program. The research indicated an effective degree of management leadership has not been demonstrated by the Saudi industries in connection with their responsibility for controlling and reducing industrial injuries.

Safety professionals agree that accidents occur as the result of an employee's unsafe behavior, unsafe physical condition, or the result of failure in the management systems. An employee's behavior

modification and change may be accomplished through training and education supported by management. Unsafe physical conditions should be corrected by installing safety devices and providing personal protective equipment. The research indicated that Saudi management had provided personal protective equipment. However, the provision of such equipment without a program for their maintenance and proper employee safety training together with management activity of motivating employees may not result in reducing industrial injuries. Therefore, proper training and maintenance programming should be considered.

Making industrial safety an organizational objective is not an end in itself. Management should implement this objective by training and educating itself and its employees in the principles, theories, and practices of accident prevention; assigning responsibility and fixing accountability for accident prevention; keeping accurate accident records; providing adequate medical support; conducting proper physical surveys; and persuading and motivating employees in developing safe work habits.

The research indicated that there is an apparent need for Saudi industrial managers to believe that knowledge of past safety performance usually aids in controlling the present and in planning for the future. This can be attained by keeping comprehensive retrievable records. These records should be kept and management should make a concerted effort to increase their awareness of effective safety management and the utilization of safety records in their decision making activities.

Management has a moral responsibility of providing a safe and healthful place of work for its employees. In addition, a safe and healthy place to work is the foundation of a successful safety program. The Saudi industrial managers demonstrated an overall higher concern in the area of physical surveys than in other areas of safety. However, apparently the physical surveys were more or less made in casual ways to check the presence of employees and unsafe conditions rather than a systematic procedure to reveal or expose safety problems or violations. This is supported by the absence of providing inspectors with specific inspection training of inspection techniques and skills. No specific person was assigned the job of inspection, and the responsibility to review the inspection reports and direct corrective actions was deficient. Safety inspection should therefore become systematic and incorporated into the overall management activity.

In order for an industrial worker to perform his tasks safely and efficiently, he must be in good health. Pre-employment physical examinations should be administered to all employees for proper placement on the job. First-aid material should be available and should be administered by trained people. A careful record should be kept as to type, place, frequency, and cost of injury. While the majority of Saudi industrial organizations indicated the availability, inspection, and replenishing of first-aid material, there was an absence of medically trained personnel in a majority of the industrial facilities. This study indicated that management has limited activity supporting the general health and safety of employees as measured by

the absence of trained medical personnel in the facilities. The availability of first-aid material will be of little value if trained personnel are not available to administer it. The research indicated the need for raising the awareness level of management regarding industrial accidents.

The review of literature indicated that when it comes to matters and concerns that affect the well being of society, government controls, rules and regulations do make a difference. An example was the establishment in the United States of the Occupational Safety and Health Agency. This study indicated there was an apparent and insufficient involvement and coordination among the many different government ministries and agencies, and that the Saudi government's current efforts in the safety area were minimal. These efforts should be increased and targeted at specific needs identified in this study.

Saudi Arabia suffers certain major constraints associated with industrialization such as a small population, lack of technological and management know-how, and lack of technical and skilled manpower (Saudi Arabia Central Department of Statistics, 1974; Algosaibi, 1977). When combined with few rules and regulations for the prevention of occupational hazards in most industrial organizations, unavailability of plans for all branches of the government that supervises the protection of workers, and the absence of a unified national plan in the prevention and treatment of occupational hazards (Hasanian, Note 2), it becomes clear that the government must increase its efforts in the area of industrial safety. A total comprehensive

governmental industrial safety policy should be developed and implemented by the government.

It is obvious that industry in Saudi Arabia is in its infancy with regard to occupational safety and health. Unless additional safeguards and policies are implemented, a heavy toll in human lives and suffering may hinder the objective of increasing the availability of manpower in the third Five-Year Plan.

### RECOMMENDATIONS

The following recommendations are expressed in terms of needed activities to help in the improvement of industrial safety programs and efforts and how these efforts might aid in increasing the availability of Saudi manpower. These recommendations are based on the findings of the study and the industrial safety literature. The recommendations are directed towards private industry and the government.

#### Recommendations for Private Industry

Reducing industrial accidents in an industrial organization is primarily the job of management. Effective management action is the key to controlling and reducing on-the-job injuries. Management is responsible for the safety of its employees and should use and apply all means to control and reduce industrial injuries. It is recommended that management should:

1. Take a more active role in demonstrating its leadership in managing the safety function. This can be accomplished by formulating

a written safety policy and supporting the safety program using the many strategies available to management.

2. Assign responsibility commensurate with authority and fix accountability for industrial safety.

3. Train and educate itself in safety management theories, principles, and practices to raise its awareness. Various training techniques should be investigated, developed, and implemented to enhance the safety awareness of workers.

4. Establish and maintain adequate and retrievable accident records in order that they may be used as input for resetting goals and planning.

5. Establish a system of physical surveys for facilities, personnel, and equipment.

6. Provide appropriate medical support that keeps personnel on the job rather than taking sick or injury leave.

7. Establish techniques to motivate and persuade workers to work safely and develop safe work habits.

#### Recommendations for the Government

Government control, rules, and regulations are key factors for the adoption and implementation of an industrial safety program. In order to reduce the incidence of industrial accidents and increase the availability of Saudi manpower it is recommended that the government should develop and implement an industrial safety policy which includes the following specific recommendations:

1. Eliminate the present redundancy of safety programs,

duplication of programs, waste of effort, and lack of coordination.

2. Establish an independent and central occupational safety and health agency authorized to control, regulate, issue rules, coordinate, and consolidate the many different industrial safety programs of the different governmental ministries and agencies.

3. If an independent central agency is established, each government ministry and agency should establish its own safety department or unit and maintain adequate internal safety records.

4. Include basic industrial safety instruction in all vocational training centers and develop plans and procedures for the training of industrial personnel and safety.

5. Assign industrial safety professionals as part of industrial park management units to offer industrial safety advice.

6. Recruit and train industrial safety inspectors.

7. Use media to promote and spread industrial safety awareness.

8. Introduce industrial safety topics as part of pre-university public school curriculum.

9. Introduce occupational safety and health as a major field of study in universities.

10. Include industrial safety courses as a requirement for all engineering and business degrees.

11. Initiate research activity in occupational safety and health.

12. Require periodic inspections of public and industrial facilities.

### Recommendations for Further Studies

Since this study was a status study to determine what the safety situation is in the Kingdom's industry and the type of government involvement in safety efforts, additional data and direction could be possible if further studies were done on specific areas addressed in this study. Generally, additional studies could be fruitful in the following areas:

1. A comparative analysis study of private industries by population size.
2. A comparative industrial safety study between government controlled industries and private industries.
3. A field study on industry's status of housekeeping.
4. An evaluation of the causes of accidents in Saudi industry.



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APPENDIX A

Letter of Introduction and Questionnaire  
in English and Arabic

  
 KINGDOM of SAUDI ARABIA المملكة العربية السعودية  
 MINISTRY of DEFENSE & AVIATION & INSPECTOR GENERAL وزارة الدفاع والطيران والمفتشية العامة  
 ARMY AIR DEFENSE COMMAND قيادة الدفاع الجوي / الجيش  
 PLANNING & PROJECTS DIRECTORATE قسم التخطيط والشاريع

---

DATE: \_\_\_\_\_ التاريخ:

Messers:

LTC/ENGR. Abdulla R. Jastaniah is one of the Air Defense Command Officers who is currently attending the University of Northern Iowa in the United States of America to receive the Doctor of Industrial Technology Degree. He is now at the stage of writing his doctoral dissertation; his dissertation topic is "Industrial Safety and Technologicalization: An Analysis of the Management of Industrial Safety Programs in Saudi Arabia."

Part of his degree requirement is to conduct a survey of Industrial organizations in the Kingdom which includes a questionnaire that relates to his dissertation topic.

We ask your cooperation in completing the questionnaire so that LTC Jastaniah may be able to complete his studies.

Your time and attention is very much appreciated.

Colonel



KHALID BIN SULTAN BIN ABDULAZIZ  
 Director, Air Defense Projects and Planning.



## IMPORTANT

PLEASE READ THESE INSTRUCTIONS BEFORE YOU ATTEMPT TO ANSWER THE QUESTIONNAIRE.

## THANK YOU

The purpose of this survey is to collect information and statistics that relate to the field of industrial safety management and industrial accidents. This survey has no connection with any government office whatsoever. The information provided from the survey will only be used to complete a doctoral dissertation on evaluating the status of industrial safety management in Saudi Arabia.

The goal of this dissertation is to describe the current status of industrial safety in the private sector in the Kingdom of Saudi Arabia and offer recommendations for possible improvement. The researcher aims at helping, as a result of the complete dissertation, both private and public sectors in finding ways and means of preserving Saudi Arabia's meager manpower. The envisioned benefits are economic and social gains for the entire country.

The researcher appreciates your cooperation in providing correct and accurate responses to the questionnaire. Please take the time to answer all the questions in the space provided, putting an (X) mark for those questions that require only one choice and filling all the spaces on the other questions. If you need more space to answer any questions, you can use an additional sheet of plain paper to express your opinions and ideas. In giving correct replies you are helping to build a greater Saudi Arabia in which our children will be proud to live. This researcher would like to assure you that your responses will be totally confidential and anonymous. For that reason the name of your organization or any of its members are not needed in this survey.

Your time and attention is very much appreciated.

1. Type of major industrial operation  
(check one in each column)

Manufacturing	_____	Mechanical	_____
Distribution (including	_____	Electrical	_____
warehousing)	_____	Chemical	_____
Service	_____	Metal Work	_____
Construction	_____	Wood Work	_____
Other (specify)	_____	Paper Products	_____
_____		Petrochemical	_____
		Food Products	_____
		Cement Products	_____
		Other (specify)	_____
		_____	_____

2. Total number of workers at this location (including management personnel) \_\_\_\_\_

3. Title of person answering this survey  
\_\_\_\_\_

4. Is industrial safety considered to be one of the objectives of your organization?

Yes \_\_\_\_\_

No \_\_\_\_\_

5. Does your organization have a written safety policy?

Yes \_\_\_\_\_

No \_\_\_\_\_

6. Does your organization have a safety department?

Yes \_\_\_\_\_

No \_\_\_\_\_

If NO, please answer the following:

a) Has the responsibility of accident prevention been assigned to any one at the management or supervisory levels?

Yes \_\_\_\_\_

b) Is this responsibility assigned as: (check one)

(1) Full-time \_\_\_\_\_ (2) Part-time \_\_\_\_\_, what % \_\_\_\_\_

No \_\_\_\_\_ (proceed to question #8)

7. What level(s) of management is/are responsible and accountable for safety in your organization? (check appropriate answers)

a) Top management \_\_\_\_\_

b) Middle management \_\_\_\_\_

c) Supervisory level \_\_\_\_\_

d) Foreman \_\_\_\_\_

8. Are the accident prevention responsibilities in your organization defined in writing?

Yes \_\_\_\_\_

No \_\_\_\_\_

9. How often are safety meetings by management or supervisors held with personnel they directly supervise? (check appropriate answer)

a) never \_\_\_\_\_

b) four times/year \_\_\_\_\_

c) three times/year \_\_\_\_\_

d) twice/year \_\_\_\_\_

e) once/year \_\_\_\_\_

f) twice/month \_\_\_\_\_

g) once/month \_\_\_\_\_

h) once/week \_\_\_\_\_

i) other (specify) \_\_\_\_\_

10. To what extent are you aware of your organization's accident record? (Check appropriate answer)
- a) Have no records \_\_\_\_\_
  - b) Have some records for the organization \_\_\_\_\_
  - c) Have some records for some departments \_\_\_\_\_
  - d) Have detailed records for each department \_\_\_\_\_
11. How often do you prepare or have you prepared an accident analysis of your organization for your superior? (check appropriate one)
- a) never \_\_\_\_\_
  - b) four times/year \_\_\_\_\_
  - c) three times/year \_\_\_\_\_
  - d) twice/year \_\_\_\_\_
  - e) once/year \_\_\_\_\_
  - f) once/month \_\_\_\_\_
  - g) other (specify) \_\_\_\_\_
12. Who has a set of safety rules and/or safety procedures in your organization? (check appropriate answers)
- a) No one \_\_\_\_\_
  - b) All middle managers \_\_\_\_\_
  - c) All supervisors \_\_\_\_\_
  - d) All foremen \_\_\_\_\_
  - e) All workers \_\_\_\_\_
13. In your organization what type of injury occurs most frequently? (Mark only the three more frequent) -- 1 = highest frequency; 2 = second highest; 3 = third highest.
- a) Amputation \_\_\_\_\_
  - b) Burns and heat \_\_\_\_\_
  - c) Chemical burn \_\_\_\_\_
  - d) Concussion \_\_\_\_\_
  - e) Crushing injury \_\_\_\_\_
  - f) Cut, laceration, puncture, abrasion \_\_\_\_\_
  - g) Bruise, contusion \_\_\_\_\_
  - h) Occupational illness \_\_\_\_\_
  - i) Sprain, strain \_\_\_\_\_
  - j) Fracture \_\_\_\_\_
  - k) Hernia \_\_\_\_\_
  - l) Other (specify) \_\_\_\_\_
14. Of all the above injuries which has the greatest severity regardless of frequency? \_\_\_\_\_
15. In which of the following manner does your company assign accident prevention responsibilities? (check appropriate answer)
- a) written \_\_\_\_\_
  - b) verbal \_\_\_\_\_
  - c) written and verbal \_\_\_\_\_
  - d) none \_\_\_\_\_

16. In which way do you verify that the supervisors understand their accident prevention responsibilities? (check appropriate answer)
- a) do not verify \_\_\_\_\_
  - b) oral feedback from supervisors \_\_\_\_\_
  - c) supervisors rating from superiors \_\_\_\_\_
  - d) others (Specify) \_\_\_\_\_
17. Are supervisors counseled on their safety performance?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
18. Is there any follow-up with supervisors who have the poorest departmental safety performance?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
19. Is there recognition given to supervisors with good safety performance?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
20. Is the supervisor's safety record included for consideration in his performance review?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
21. Do you assess the supervisor's safety attitudes/performance regarding safety?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
22. Who enforces safety rules and regulations within the plant area?
- (Please give position title only) \_\_\_\_\_
23. What do you do if you observe a supervisor failing to correct an unsafe practice? (check appropriate answer)
- a) nothing \_\_\_\_\_
  - b) verbal warning \_\_\_\_\_
  - c) written warning \_\_\_\_\_
  - d) other (specify) \_\_\_\_\_

24. Do you encourage receiving safety recommendations from employees?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_

If YES, from which group of employees do most safety recommendations come?

---

25. Have your supervisors been trained in accident prevention techniques?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

26. Does your organization require that your supervisors attend safety training courses?

Yes \_\_\_\_\_  
 No \_\_\_\_\_ (If no, proceed to question #27)

- a) Are these safety training courses offered in your organization?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

- b) If NO, where do your supervisors attend safety training?

(1) local schools \_\_\_\_\_  
 (2) government training centers \_\_\_\_\_  
 (3) other (specify) \_\_\_\_\_

---

27. Do new employees receive accident prevention training?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

If YES, please answer the following:

- a) From whom (position title) \_\_\_\_\_

- b) What form does it take? (check appropriate answers)

(1) on the job \_\_\_\_\_  
 (2) at breaks \_\_\_\_\_  
 (3) in formal setting in plant \_\_\_\_\_  
 (4) written material given \_\_\_\_\_  
 (5) other (specify) \_\_\_\_\_

---

28. Does the new employee's supervisor follow up initial orientation training with a discussion of rules and procedures and safe work practices?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

29. Have written job descriptions been prepared?

Yes \_\_\_\_\_

No \_\_\_\_\_

If YES, do these job descriptions include safe work practices and a list of personal protective equipment?

Yes \_\_\_\_\_

No \_\_\_\_\_

30. Does your organization provide personal protective equipment?

Yes \_\_\_\_\_

No \_\_\_\_\_

If YES, please answer the following:

a) Which of the following personal protective equipment is provided? (check appropriate ones)

- |                                |                                |
|--------------------------------|--------------------------------|
| (1) ear muffs _____            | (6) respirators or masks _____ |
| (2) welding helmets _____      | (7) safety belts _____         |
| (3) welding hand shields _____ | (8) safety shoes _____         |
| (4) face shields _____         | (9) safety helmets _____       |
| (5) goggles _____              | (10) other (specify) _____     |

b) Does the organization enforce the use of safety equipment?

Yes \_\_\_\_\_

No \_\_\_\_\_

c) Does the organization have a program for maintaining safety equipment?

Yes \_\_\_\_\_

No \_\_\_\_\_

31. Does each supervisor have a list of the unsafe practices/conditions that apply to each job?

Yes \_\_\_\_\_

No \_\_\_\_\_

32. Have your employees been instructed in occupational hygiene?

Yes \_\_\_\_\_

No \_\_\_\_\_

33. Approximately what percent of your training cost is allocated to safety training? (check appropriate answer)

a) Less than 5% \_\_\_\_\_

b) 5 - 10% \_\_\_\_\_

c) 10 - 20% \_\_\_\_\_

d) 20 - 30% \_\_\_\_\_

e) more than 30% \_\_\_\_\_

f) other (specify) \_\_\_\_\_

34. Do you maintain records on work-related:
- |                       |     |       |    |       |
|-----------------------|-----|-------|----|-------|
| a) injuries/illnesses | Yes | _____ | No | _____ |
| b) lost work time     | Yes | _____ | No | _____ |
| c) accident costs     | Yes | _____ | No | _____ |
35. How often are injury summary reports provided by supervisors to management? (check appropriate answer)
- |  |                           |
|--|---------------------------|
| a) Never _____ (If never, proceed to question #39) | e) once/month _____       |
| b) three times/year _____                          | f) once/week _____        |
| c) twice/year _____                                | g) others (specify) _____ |
| d) once/year _____                                 |                           |
- 
36. Does the report show the cost of work injuries?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
37. Does the report specify the area of the plant where injury took place?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
38. Do you think managers who receive the report understand it?
- Yes \_\_\_\_\_
- No \_\_\_\_\_
39. When does the investigation usually take place in respect to time of accidents? (please check appropriate answer)
- |   |
|---|
| a) Immediately after the accident _____ |
| b) Within two hours _____               |
| c) Within the day _____                 |
| d) Within the week _____                |
| e) Longer than a week _____             |
40. Who investigates accidents? (position title) \_\_\_\_\_
- 
41. What is the title of the highest executive or management representative who reviews the accident investigation report?
- 
42. Who else gets a copy of the report? \_\_\_\_\_
-

43. Are employees required to report any potential safety hazards?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- If YES, in what form are they reported? (check one)  
 a) written \_\_\_\_\_  
 b) verbal \_\_\_\_\_
44. What is the incentive for the employee who reports these hazards?  
 (check appropriate answer)
- a) monetary \_\_\_\_\_  
 b) recognition from management \_\_\_\_\_  
 c) others (specify) \_\_\_\_\_
45. Please provide the following information, as accurately as possible, for the last two years. (If no accurate record was maintained, please provide a reasonable estimate). Data is from: (check one)

Records \_\_\_\_\_  
 Estimate \_\_\_\_\_

	<u>1980</u>	<u>1981</u>
a) Number of work-related injuries	_____	_____
b) Number of work-related injuries without lost workdays	_____	_____
c) Number of work-related injuries with lost workdays	_____	_____
d) Number of work-related illnesses	_____	_____
e) Number of work-related illnesses without lost workdays	_____	_____
f) Number of work related illnesses with lost workdays	_____	_____
g) Number of disabling work injuries (no longer able to perform previous job)	_____	_____
h) Number of fatal injuries (work-related)	_____	_____



46. Do you conduct routine safety inspections of your facilities?

Yes \_\_\_\_\_

No \_\_\_\_\_ (If no, proceed to question #49)

If YES, please answer the following:

a) Who makes the inspection?  
(position title) \_\_\_\_\_

b) How often are inspections made? (check one)

(1) daily \_\_\_\_\_

(2) once/week \_\_\_\_\_

(3) once/month \_\_\_\_\_

(4) twice/month \_\_\_\_\_

(5) once/year \_\_\_\_\_

(6) twice/year \_\_\_\_\_

(7) three times/year \_\_\_\_\_

(8) four times/year \_\_\_\_\_

(9) others (specify) \_\_\_\_\_

47. Are inspectors given specific training for the inspection job?

Yes \_\_\_\_\_

No \_\_\_\_\_

48. Who reviews the inspector's report?

(position title) \_\_\_\_\_

49. Is the plant provided with first-aid material?

Yes \_\_\_\_\_

No \_\_\_\_\_ (If no, proceed to question #50)

If YES, please answer the following:

a) Are they inspected periodically?

Yes \_\_\_\_\_

No \_\_\_\_\_

b) Do you have a written procedure for replenishing first-aid material?

Yes \_\_\_\_\_

No \_\_\_\_\_

c) Who is responsible for replenishment? (position title)

\_\_\_\_\_

50. Does your company have an in-house nurse or doctor?  
 Yes \_\_\_\_\_ (If yes, proceed to question 52)  
 No \_\_\_\_\_
- If NO, are trained medical personnel on duty in your plant?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- If YES, who? (position, title) \_\_\_\_\_
51. If you do not have an in-house nurse or doctor, do you have one on call?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
52. Do you have in your facilities a first-aid treatment room?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- Not required \_\_\_\_\_, Why? \_\_\_\_\_
53. Do you have an assigned vehicle to carry injured persons to hospitals?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
54. Is an accurate log kept of all first-aid/medical treatment?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
55. Are pre-employment physical examinations given to all employees?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
56. Have employees been instructed as to what to do in case of an accident or emergency?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
57. Do you have an employee evacuation plan in the event of a life threatening emergency?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- If your answer is YES, please answer the following:  
 a) Is the evacuation plan reviewed periodically?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_

- b) Do you conduct emergency evacuation drills periodically?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- c) How often do you conduct these drills? (check one)  
 once/year \_\_\_\_\_, twice/year \_\_\_\_\_, others (specify) \_\_\_\_\_  
 \_\_\_\_\_

58. Do you conduct safety contests between divisions of your plant?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_

If YES, do you attach a reward to the contest results?

- Yes \_\_\_\_\_  
 No \_\_\_\_\_

If YES, what form are the rewards?  
 (check appropriate answer[s])

- a) Monetary \_\_\_\_\_  
 b) Trophies \_\_\_\_\_  
 c) Letter of recognition \_\_\_\_\_

59. Do you show safety films to employees?

- No \_\_\_\_\_  
 Yes \_\_\_\_\_ (check one)

- a) once/week \_\_\_\_\_  
 b) once/month \_\_\_\_\_  
 c) twice/month \_\_\_\_\_  
 d) once/year \_\_\_\_\_  
 e) twice/year \_\_\_\_\_  
 f) three times/year \_\_\_\_\_  
 g) others (specify) \_\_\_\_\_

60. Do you have safety posters in the plant area?

- Yes \_\_\_\_\_  
 No \_\_\_\_\_

If YES, how often do you change them with other posters?

(check one)

- a) once/year \_\_\_\_\_  
 b) twice/year \_\_\_\_\_  
 c) three times/year \_\_\_\_\_  
 d) others (specify) \_\_\_\_\_

61. Do you give rewards to outstanding employees or divisions of your plant when safety goals are met?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- If YES, what form are the rewards? (check appropriate answer[s])  
 a) monetary \_\_\_\_\_  
 b) trophies \_\_\_\_\_  
 c) letter of recognition \_\_\_\_\_  
 d) other (specify) \_\_\_\_\_
62. In a scale of one to ten, where would you rank the effectiveness of your safety activities? (please circle one)
- |     |   |   |   |   |      |   |   |   |    |
|-----|---|---|---|---|------|---|---|---|----|
| 1   | 2 | 3 | 4 | 5 | 6    | 7 | 8 | 9 | 10 |
| Low |   |   |   |   | High |   |   |   |    |
63. Would you welcome assistance in improving or developing a safety program for your organization?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_  
 If NO, why? \_\_\_\_\_
- 

Please indicate the degree of your agreement or disagreement with each of the FOLLOWING statements. CIRCLE the number of the appropriate response using the scale under each item.

64. The government must develop and implement an industrial safety program for Saudi industry.
- |                      |          |         |       |                   |
|----------------------|----------|---------|-------|-------------------|
| strongly<br>disagree | disagree | neutral | agree | strongly<br>agree |
| 1                    | 2        | 3       | 4     | 5                 |
65. The government must adopt and promote industrial safety rules and regulations.
- |                      |          |         |       |                   |
|----------------------|----------|---------|-------|-------------------|
| strongly<br>disagree | disagree | neutral | agree | strongly<br>agree |
| 1                    | 2        | 3       | 4     | 5                 |

66. The government should provide assistance to industry in developing industrial safety programs.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

67. An adequate government industrial safety program already exists.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

68. The government has provided us with a clear unambiguous set of written industrial safety rules and regulations that are strictly followed.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

69. These rules and regulations are strictly enforced by the government.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

70. Government inspectors should visit us at least once a year.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

71. Government inspectors should make follow-up visits to insure violations have been corrected.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

72. Government inspectors should give citations for uncorrected violations of safety conditions.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

73. The government inspectors are generally well trained in industrial safety practices and usually provide our organization with professional safety recommendations.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

74. At present there is too much control by the government in industrial safety matters.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

75. At present there are too many rules and regulations by the government regarding industrial safety.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

76. Presently the government is doing an adequate job in preventing industrial accidents.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

77. At present there is a government agency that provides industry with assistance in preventing industrial accidents.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

78. The government should publish and provide industry with a copy of industrial safety standards.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

79. Industrial safety training courses should be offered free of charge regularly at local schools and training centers.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

80. Industrial accidents reduce our efficiency and increase our operation costs.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

81. Industrial accidents are part of life and must be accepted as such by management.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

82. Many of the present day occupational illnesses with which people suffer could not have been anticipated or avoided.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

83. A monetary value can be placed on human life and safety.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

84. The benefits of safety outweigh its cost.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

85. Safety is the most important element of the working environment.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

86. Are you interested in receiving the results of this survey?

Yes \_\_\_\_\_ (please provide your name and address)

No \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Thank you again.

  
 KINGDOM of SAUDI ARABIA  
 المملكة العربية السعودية  
 وزارة الدفاع والطيران والمفتشية العامة  
 MINISTRY of DEFENSE & AVIATION & INSPECTOR GENERAL  
 قيادة الدفاع الجوي / الجيش  
 ARMY AIR DEFENSE COMMAND  
 قسم التخطيط والمشاريع  
 PLANNING & PROJECTS DIRECTORATE

التاريخ : \_\_\_\_\_ DATE \_\_\_\_\_

السادة :

المقدم مهندس عبدالله رشاد جستاني هو احد ضباط قيادة الدفاع الجوي المبتعثين حالياً للدراسة في جامعة شمال ايوا في الولايات المتحدة الامريكية للحصول على درجة الدكتوراه في التكنولوجيا الصناعية . وهو الان في مرحلة كتابة رسالة الدكتوراه ، وموضوع الرسالة هو : ( التكنولوجيا والسلامة الصناعية : دراسة تحليلية لادارة برامج السلامة الصناعية في المملكة العربية السعودية ) .

وكجزء من متطلبات درجة الدكتوراه عليه القيام بمسح للمؤسسات الصناعية في المملكة العربية السعودية ويشمل ذلك استمارة اسئلة ترتبط بموضوع رساله .  
 نأمل تعاونكم في تعبئة الاستماره المرفقه حتى يتمكن المقدم الجستانيه من اكمال دراسته .

شاكرين لكم كريم اهتمامكم وتقبلوا تحياتي .،،،،،

العقيد  


خالد بن سلطان بن عبدالعزيز  
 مدير تخطيط ومشاريع الدفاع الجوي





٥ هل لمؤسستكم سياسة وأنظمة مكتوبة للسلامة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٦ هل في مؤسستكم ادارة خاصة بالسلامة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابة بالنفي ، نرجو الاجابة على مايلي :

أ) هل كلف أي شخص على مستوى الادارة أو الاشراف بمسئولية الوقاية من الحوادث ؟

نعم \_\_\_\_\_

ب) هل هذه المسئولية مناطة به على اعتبارها : ( ضع علامة على واحدة ممايلي )

(١) تفرغ كامل \_\_\_\_\_ (٢) تفرغ جزئي \_\_\_\_\_ ، نسبة التفرغ \_\_\_\_\_

لا \_\_\_\_\_ ، ( تجاوز السؤال التالي الى السؤال رقم ٨ )

٧ ما مستوى أو مستويات الادارة المسؤولة والملتزمة بالسلامة في مؤسستكم ؟ (ضع علامة أمام الاجابة المناسبة)

( المناسبة )

أ) الادارة العليا ( العامه ) \_\_\_\_\_

ب) الادارة الوسطى ( الاقسام ) \_\_\_\_\_

ج) مستوى مشرفين \_\_\_\_\_

د) رئاسة عمال \_\_\_\_\_

٨ هل مسؤوليات الوقاية من الحوادث في مؤسستكم مكتوبة ومحددة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٩ ماهي عدد مرات اجتماعات السلامة التي تعقدتها الادارة أو المشرفين مع الافراد الذين يرأسونهم مباشرة ؟

( ضع علامة امام الاجابة الصحيحة )

_____	و) مرتين شهريا	_____	أ) لايعقد اجتماعات بتاتا
_____	ز) مرة واحدة شهريا	_____	ب) اربع مرات سنويا
_____	ح) مرة واحدة اسبوعيا	_____	ج) ثلاث مرات سنويا
_____	ط) خلاف ذلك(حددالمرات)	_____	د) مرتين سنويا
		_____	هـ) مرة واحدة سنويا

١٠ ما مدى علمكم بسجل الحوادث بمؤسستكم ؟ ( ضع علامة امام الاجابة الصحيحة )

\_\_\_\_\_ أ) لا يوجد لدينا سجلات  
\_\_\_\_\_ ب) لدينا بعض السجلات للمؤسسه  
\_\_\_\_\_ ج) لدينا بعض السجلات لبعض الاقسام  
\_\_\_\_\_ د) لدينا سجلات مفصلة لكل قسم

١١ كم عدد المرات التي تعدون او تعد لكم دراسة تحليلية للحوادث في مؤسستكم وتقدم لرؤسائكم ؟

( ضع علامة امام الاجابة المناسبه )

_____	أ) لا يتم تحفير هذه التحاليل بتاتا
_____	ب) اربع مرات في السنه
_____	ج) ثلاث مرات في السنه
_____	د) مرتين سنويا
_____	هـ) مرة واحدة سنويا
_____	و) مرة واحدة شهريا
_____	ز) خلاف ذلك(الرجاء التحديد)

١٢ من في مؤسستكم لديه انظمة و/او اجراءات السلامه ؟ (ضع علامة امام الاجابة المناسبه )

\_\_\_\_\_ أ) لا أحد  
\_\_\_\_\_ ب) جميع مدراء الادارات  
\_\_\_\_\_ ج) جميع المشرفين  
\_\_\_\_\_ د) جميع رؤساء العمال  
\_\_\_\_\_ هـ) جميع العمال

١٣) مانوع الاصابات التي تحدث اكثر من غيرها في مؤسستكم ؟ (ضع الرقم المناسب امام اكثر ثلاثة انواع شيوعا باستخدام معدل الدرجات التالية ) -- ١= الاكثر شيوعا ، ٢= ثاني اكثر شيوعا ، ٣= ثالث اكثر شيوعا

_____	(ا) بتر الاعضاء	_____	(ز) الرضوض والكدمات
_____	(ب) الحرق والحرارة	_____	(ح) المرض المهني
_____	(ج) الحروق الكيماوية	_____	(ط) الالتواء والعمر
_____	(د) الارتجاج في المخ	_____	(ي) الكسور
_____	(هـ) الاصابة الناتجة عن السحق	_____	(ك) الفتاق
_____	(و) القلع، التمرق، الشقب، الكشط	_____	(ل) خلاف ذلك (الرجاء التحديد)

١٤) من جميع الاصابات المذكورة اعلاه ماهي اكثرها شدة بغض النظر عن تكرارها؟

١٥) بأي من الاساليب التالية تعين شركتكم مسؤولية الوقاية من الحوادث؟ (ضع علامة امام الاجابة المناسبه)

_____	(أ) خطيا
_____	(ب) شفويا
_____	(ج) خطيا وشفويا
_____	(د) لا يتعين ذلك بتاتا

١٦) بأي كيفية تتأكدون ان المشرفين قد فهموا واستوعبوا المسؤوليات الملقاة على عاتقهم في الوقاية من الحوادث؟ (ضع علامة امام الاجابة المناسبه)

_____	(أ) لا نتأكد
_____	(ب) المعلومات المبلغة شفويا من المشرفين
_____	(ج) تقييم الرؤساء للمشرفين الذين يعملون تحت ادايتهم
_____	(د) خلاف ذلك (الرجاء التوضيح)

١٧) هل يتم اشعار المشرفين حول ادائهم في مجال السلامة؟

_____	نعم
_____	لا

١٨) هل تتم متابعة المشرفين الذين يظهر منهم اداء ضعيف في السلامة في اقسامهم؟

_____	نعم
_____	لا

١٩) هل هناك تقدير يعطي للمشرفين الذين يظهر اداء جيد في مجال السلامة؟

_____	نعم
_____	لا

٢٠) هل يدرج سجل السلامة للمشرفين للنظر فيه وتقديره عند مراجعة ادائه للعمل؟

_____	نعم
_____	لا

٢١) هل تقومون بتقييم اداء/اهتمام المشرفين فيما يتعلق بالسلامة؟

_____	نعم
_____	لا

٢٢) من يقوم بتطبيق قواعد وانظمة السلامة ضمن منطقة المصنع؟ (نرجو ذكر مسمى الوظيفة فقط)

٢٣) ماذا تفعلون اذا لاحظتم ان هناك مشرف يعجز عن تصحيح اجراء لاتطبق فيه قواعد السلامة؟ (ضع

علامة امام الاجابة المناسبه)

_____	(أ) لا شيء
_____	(ب) انذار شفوي
_____	(ج) انذار خطي
_____	(د) خلاف ذلك (الرجاء التوضيح)

٢٤ هل تشجعون تلقي التوصيات المتعلقة بالسلامة من الموظفين والعمال ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الإجابة بنعم ، فمن أي مجموعة من الموظفين تمل إليكم معظم توصيات السلامة ؟

٢٥ هل تم تدريب المشرفين لديكم على طرق الوقاية من الحوادث ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٢٦ هل تستلزم مؤسستكم ان يلتحق المشرفين بها بدورات التدريب على السلامة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_ ( تجاوز مايلي وجواب على السؤال رقم ٢٧ )

أ) هل تقدم دورات التدريب الخاصة بالسلامة في مؤسستكم ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ب) إذا كان الجواب بالنفي ، ابيّن يتلقى المشرفون التدريب على السلامة ؟ (ضع علامة امام الاجابة المناسبة)

(١) مدارس محليه \_\_\_\_\_  
(٢) مراكز تدريب حكومية \_\_\_\_\_  
(٣) خلاف ذلك (الرجاء التوضيح) \_\_\_\_\_

٢٧ هل يتلقى الموظفون الجدد تدريباً على الوقاية من الحوادث ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الإجابة بنعم ، نرجو الإجابة على مايلي :

أ) ممن يتلقون هذه التدريبات ( مسمى الوظيفة فقط ) \_\_\_\_\_  
ب) على أي صورة تقدم هذه التدريبات ( ضع علامة امام الاجابة المناسبه )

(١) اثناء تأدية العمل \_\_\_\_\_  
(٢) خلال الاستراحة من العمل \_\_\_\_\_  
(٣) في اماكن مخصصة للتدريب بالمنصع \_\_\_\_\_  
(٤) خلاف ذلك ( الرجاء ائتوضيح ) \_\_\_\_\_

٢٨ هل المشرف على الموظف الجديد يتبع التدريب المبدئي بمناقشة القواعد والاجراءات وانظمة العمل السليمة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٢٩ هل أوصاف المهام الوظيفية بمؤسستكم مكتوبة وموجودة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الإجابة بنعم ، هل تتضمن اوصاف الوظائف هذه اجراءات العمل السليم وقائمة بمعدات الوقاية الشخصية ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٠ هل تؤمن مؤسستكم معدات الوقاية الشخصية ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الاجابة بنعم ، نرجو الاجابة على مايلي :-

أ) أي من معدات الوقاية الشخصية التالية يتم تأمينها ؟ ( ضع علامة امام الاشياء المقدمة )

_____	(١) غطاء آذن	_____	(٦) كمامات او اقنعة تنفس
_____	(٢) خوذ لحام	_____	(٧) احزمة سلامه
_____	(٣) دروع يدوية لحام	_____	(٨) احذية سلامه
_____	(٤) دروع واقية للوجه	_____	(٩) خوذات سلامه
_____	(٥) نظارات وقايه	_____	(١٠) خلاف ذلك (الرجاء التوضيح)

ب) هل تفرض وتطبق مؤسستكم استعمال معدات الوقاية هذه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ج) هل لدى مؤسستكم برنامج لصيانة معدات الوقاية هذه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣١ هل لدى كل مشرف قائمة بالحالات والاجراءات الغير مأمونة التي تنطبق على كل وظيفة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٢ هل تلقى موظفوكم دروسا في الصحة المهنيه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٣ ماهي النسبة المئوية التقريبية من تكاليف التدريب العام خصمت للتدريب على السلامة ؟ ( ضع علامه امام الاجابة المناسه )

_____	(أ) أقل من ٥%	_____	(د) ٢٠ - ٣٠ %
_____	(ب) ٥ - ١٠ %	_____	(هـ) اكثر من ٣٠ %
_____	(ج) ١٠ - ٢٠ %	_____	(و) خلاف ذلك (الرجاء التوضيح)

٣٤ هل تحتفظون بسجلات تتعلق بالعمل فيما يخص :

_____	أ) الاصابات / المرضى	_____	نعم
_____	ب) وقت عمل مفقود	_____	نعم
_____	د) تكاليف الحوادث	_____	نعم

٣٥ ماهي عدد مرات تقديم تقارير مختصرة عن الاصابات من قبل المشرفين الى الادارة ؟ ( ضع علامه امام الاجابة المناسه )

_____	(أ) لاتقدم تقارير	_____	( تجاوز الى السؤال رقم ٣٩ )
_____	(ب) ثلاث مرات سنويا	_____	(هـ) مرة واحدة شهريا
_____	(ج) مرتين سنويا	_____	(و) مرة واحدة اسبوعيا
_____	(د) مرة واحدة سنويا	_____	(ز) خلاف ذلك (الرجاء التوضيح)

٣٦ هل يوضح التقرير تكلفة اصابات العمل ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٧ هل يوضح التقرير مناطق المصنع التي تحدث فيها الاصابات ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٨ هل تعتقد ان المدرس الذين يتلقون التقرير يفهمونه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٣٩ متى يبدأ التحقيق عادة بالنسبة لزمان وقوع الحوادث ؟ ( ضع علامة امام الاجابة المناسبه )

( أ ) بعد وقوع الحادث فورا  
( ب ) خلال ساعتين من وقوع الحادث  
( ج ) في نفس يوم وقوع الحادث  
( د ) خلال اسبوع من وقوع الحادث  
( هـ ) بعد اكثر من اسبوع من وقوع الحادث

٤٠ من يقوم بالتحقيق في الحوادث ؟ ( مسمى الوظيفة فقط ) \_\_\_\_\_

٤١ ماهو مسمى وظيفة اعلى مندوب تنفيذي او مندوب من الادارة يقوم بمراجعة تقرير التحقيق عــــن الحوادث ؟ \_\_\_\_\_

٤٢ من سواه يتلقى نسخة من التقرير ؟ \_\_\_\_\_

٤٣ هل يطلب من الموظفين رفع تقارير عن أي اخطار محتملة للسلامه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابة بنعم ،فعلى اي شكل يتم تبليغهم ؟ ( ضع علامة امام احد الاختيارين التاليين )

( أ ) خطيبا \_\_\_\_\_  
( ب ) شفويا \_\_\_\_\_

٤٤ ماهو الحافز او المكافأة التشجيعية للموظف الذي يبلغ عن مثل هذه المخاطر ؟ (ضع علامة امام الاجابه المناسبه )

( أ ) مكافأة نقدية \_\_\_\_\_  
( ب ) تقدير من الادارة \_\_\_\_\_  
( ج ) خلال ذلك ( الرجاء التوضيح ) \_\_\_\_\_

٤٥ نرجو توفير المعلومات الاتية مع تحري الدقة بقدر الامكان عن السنتين الماضيتين- ( اذا لاتوجد سجلات دقيقة ،نرجو توفير تقديرات معقولة )

البيانات من: (ضع علامة على احد الاختيارين)

سجلات \_\_\_\_\_  
تقديرات \_\_\_\_\_

١٩٨١	١٩٨٠	
_____	_____	( أ ) عدد الاصابات المرتبطة بالعمل
_____	_____	( ب ) عدد الاصابات المرتبطة بالعمل بدون ضياع ايام العمل
_____	_____	( ج ) عدد الاصابات المرتبطة بالعمل مع ضياع ايام العمل
_____	_____	( د ) عدد الامراض المرتبطة بالعمل
_____	_____	( هـ ) عدد الامراض المرتبطة بالعمل بدون ضياع ايام العمل
_____	_____	( و ) عدد الامراض المرتبطة بالعمل مع ضياع ايام العمل
_____	_____	( ز ) عدد اصابات العمل التي ادت الى عجز ( عدم تمكن
_____	_____	الموظف من القيام بالعمل السابق )
_____	_____	( ح ) عدد الاصابات المميته والمرتبطه بالعمل

٤٦ هل تقومون بجولات تفقدية روتينية للسلامة لمشاآتكم ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_ ( تجاوز الى السؤال رقم ٤٩ )

اذا كانت الاجابة بنعم ،نرجو الاجابة على مايلي:

آ) من يقوم بهذه الجولات ؟ ( مسمى الوظيفة فقط ) : \_\_\_\_\_  
ب) كم مرة تتم هذه الجولات التفقدية ؟ ( ضع علامة امام واحدة مما يلي )

_____	مرتبين سنويا	_____	يومييا
_____	ثلاث مرات سنويا	_____	مرة في الاسبوع
_____	اربع مرات سنويا	_____	مرة في الشهر
_____	خلاف ذلك(الرجاء التوضيح)	_____	مرتبين شهريا
		_____	مرة واحدة سنويا

٤٧ هل يعطى المفتشون تدريبا خاصا لوظيفة التفيتش ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٤٨ من يقوم بمراجعة تقرير المفتشين ؟

( مسمى الوظيفة فقط ) \_\_\_\_\_

٤٩ هل توجد مواد الاعفاء الاولي بالممنع ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_ ( تجاوز الى اجابة السؤال رقم ٥٠ )

اذا كانت الاجابة بنعم ،نرجو الاجابة على ما يلي :

آ) هل تفتش هذه المواد دوريا ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ب) هل يوجد لديكم اجراءات مكتوبة لسد النقص في مواد الاعفاء الاولي ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ج) من المسؤول عن سد النقص؟(مسمى الوظيفة فقط ) \_\_\_\_\_

٥٠ هل لدى مؤسآتكم ممرى او طبيب مناوبين في المنشآه ؟

نعم \_\_\_\_\_ ( تجاوز الى اجابة السؤال رقم ٥٢ )  
لا \_\_\_\_\_

اذا كانت الاجابة بالنفي ،هل هناك افراد مدربين طبيا ومناوبين في المنشآه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابة بنعم ،فمن هم ؟ ( مسمى الوظيفة فقط ) \_\_\_\_\_

٥١ ان لم يكن لديكم ممرى او طبيب في المنشآه فهل لديكم واحد تحت الطلب ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٥٢ هل في منشآتكم غرفة مخصصة للاسعافات الاولية ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

غير مطلوب \_\_\_\_\_

لماذا ؟ \_\_\_\_\_

٥٣: هل لديكم سيارة مخصصة لنقل الأشخاص المصابين الى المستشفيات ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٥٤) هل يحتفظ بجمل دقيق لحالات المعالجة بالاسعافات الالوية او الطبية ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٥٥) هل يتم اجراء فحص طبي قبل التوظيف لكافة الموظفين ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٥٦) هل تم ارشاد موظفيكم الى الاجراء الواجب اتخاذه في حالة وقوع حادث او حالة طوارئ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٥٧) هل لديكم خطة لاختلاء المنشأه من الموظفين في حسه طوارئ تهدد حياتهم ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الاجابة بنعم ،نرجو الاجابة على مايلي :

أ) هل تتم مراجعة خطة الاختلاء دوريا ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ب) هل تقومون بعمل تدريبات على عملية الاختلاء دوريا ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

ج) كم مرة يتم القيام بتمارين الاختلاء ؟ ( ضع علامة امام الاجابة المناسبه )

مرة واحدة سنويا \_\_\_\_\_ ، مرتين سنويا \_\_\_\_\_ ، خلاف ذلك ( حدد ) \_\_\_\_\_

٥٨) هل تقومون بمسابقات تنافس للسلامة بين الاقسام في مصنعكم ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الاجابة بنعم ،هل تقدمون جوائز لنتائج المسابقه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الاجابة بنعم ،فما هي هذه الجوائز ؟ ( ضع علامة امام الاجوبة المناسبه )

أ) نقدية \_\_\_\_\_

ب) مداليات او كؤوس \_\_\_\_\_

ج) خطابات اعتراف وتقدير \_\_\_\_\_

٥٩) هل تعرضون افلام عن السلامة لموظفيكم ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

( الرجاء التأشير على واحدة مما يلي )

_____	■ مرتين سنويا	_____	■ مرة واحدة اسبوعيا
_____	■ ثلاث مرات سنويا	_____	■ مرة واحدة شهريا
_____	■ خلاف ذلك (الرجاء التوضيح)	_____	■ مرتين شهريا
		_____	■ مرة واحدة سنويا



٦٠ هل لديكم ملاحظات عن السلامة في المصنع ؟

نعم  
لا

إذا كانت الاجابة بنعم ،فكم مرة يتم تغييرها بملاحظات اخرى ؟ (الرجاء التأشير على واحدة ممايلي)

■ مرة واحدة سنويا  
■ مرتين سنويا  
■ ثلاث مرات سنويا  
■ خلاف ذلك (الرجاء التوضيح)

٦١ هل تعطون مكافآت للموظفين البارزين او لاقسام المصنع الذين حققوا الاهداف المتوخاة للسلامة ؟

نعم  
لا

إذا كانت الاجابة بنعم ،فما هي هذه المكافآت ؟ ( ضع علامة امام الاجوبة المناسبه )

أ) نقدية  
ب) ميداليات وكؤوس  
ج) خطاب اعتراف وتقدير  
د) خلاف ذلك(الرجاء التوضيح)

٦٢ في معدل درجات من واحد الى عشرة اين تضع معدلكم بالنسبة لتقدير انشطة السلامة لديكم ؟(الرجاء وضع دائرة حول واحدة من الدرجات ادناه )

١ حد ادنى ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩ ١٠ حد اقصى

٦٣ هل ترحبون بالمساعدة في تحسين او تطوير برامج السلامة في مؤسستكم ؟

نعم  
لا

إذا كانت الاجابة بالنفي ،فلماذا :

الرجاء ايضاح درجة موافقتكم او عدم موافقتكم مع كل افادة من الافادات التالية وذلك بوضع دائرة حول الرقم المناسب لاجابتكم باستخدام معدل الدرجات تحت كل افاده .

٦٤ يجب على الحكومة تطوير وتطبيق برنامج سلامه صناعي للمصناعات السعودية .

لاوافق بشدة لاوافق محايد أوافق أوافق بشدة  
١ ٢ ٣ ٤ ٥

٦٥ يجب على الحكومة تبني وترويج انظمة وقوانين للسلامة الصناعيه .

لاوافق بشدة لاوافق محايد أوافق أوافق بشدة  
١ ٢ ٣ ٤ ٥

٦٦ يجب ان تقدم الحكومة المساعدة للمصنعة في تطوير برامج السلامة الصناعية .

لاوافق بشدة لاوافق محايد أوافق أوافق بشدة  
١ ٢ ٣ ٤ ٥

٦٧) يوجد حاليا برنامج سلامة صناعية حكومية متكامل .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٦٨) قامت الحكومة بتزويدنا بمجموعة من قواعد وانظمة السلامة الصناعية مكتوبة وواضحة وغير غامضة ويتم اتباعها من قبلنا بدقة تامة .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٦٩) هذه القواعد والانظمة يتم تطبيقها بدقة وحرص من قبل الحكومة .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٠) المفروض على مفتشي الحكومة زيارة منشآتنا مرة واحدة في السنة على الاقل .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧١) يجب ان يقوم مفتشوا الحكومة بزيارة تعقيبية للتأكد من ان المخالفات قد تم تصحيحها .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٢) يجب على مفتشي الحكومة اعطاء مخالفات لحالات السلامة المتكررة والتي لم تصحح .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٣) يمكن القول بأن المفتشين الحكوميين مدربين جيدا على طرق ووسائل السلامة الصناعية وعادة يقدموا لمؤسستنا اقتراحات وتوصيات تدل على خبرتهم في حقل السلامة الصناعية .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٤) في الوقت الحاضر هناك مراقبة زائدة عن حدها من قبل الحكومة في أمور السلامة الصناعية .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٥) في الوقت الحاضر توجد قواعد وانظمة كثيرة جدا من قبل الحكومة في شؤون السلامة الصناعية .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٦) في الوقت الحاضر تقوم الحكومة بما يكفي في الوقاية والتقليل من الحوادث الصناعية .

لاوافق بشدة	لاوافق	محايد	أوافق	أوافق بشدة
١	٢	٣	٤	٥

٧٧) في الوقت الحاضر توجد جهة حكومية مهمتها تقديم المساعدات الخاصة بتقليل الحوادث الصناعية - فسي القطاع الصناعي .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٧٨) يجب ان تقوم الحكومة بطبع وتوزيع نسخة من مواصفات وقواعد السلامة الصناعية للقطاع الصناعي .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٧٩) المفروض تقديم دورات تدريب في السلامة الصناعية مجانا وبانتظام فيالمدارس المحلية ومراكز التدريب .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨٠) الحوادث الصناعية تؤدي الى تقليل فعاليتنا ورفع تكاليف العمل والانتاج لدينا .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨١) الحوادث الصناعية جزء من الحياة ويجب قبولها على هذا الاساس من قبل المدرأء .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨٢) العديد من الامراض المهنية اثتي يعاني منها الناس حاليا لم يكن بالامكان توقعها او تفاديها .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨٣) بالامكان وضع قيمة نقدية لحياة الانسان والسلامة .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨٤) ان فوائد السلامة تفوق تكاليفها .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٨٥) السلامة هي اهم عنصر في بيئة العمل .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٨٦) هل ترغبون استلام نتائج هذا المسح ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_  
( الرجاء اعطائنا اسم مؤسستك وعنوانك )

الشركة: \_\_\_\_\_  
العنوان: \_\_\_\_\_  
\_\_\_\_\_

ولكم جزيل الشكر.

APPENDIX B

Letter of Introduction and  
Interview Schedule in English and Arabic

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



الرجح / ١٥/١٠/٢٠١٢  
 التاريخ  
 المرفقات  
 الموضوع:

His Highness/Excellency

LTC/Engr. Abdulla R. Jastaniah is one of the Air Defense Command officers who is currently attending the University of Northern Iowa in the United States of America to receive the Doctor of Industrial Technology Degree. He is now at the stage of writing his doctoral dissertation; his dissertation topic is "Industrial Safety and Technologicalization: An Analysis of the Management of Industrial Safety Programs in Saudi Arabia." Part of his degree requirement is to conduct an interview that relates to his dissertation with the officials of the government.

We ask your cooperation in taking the time to conduct the interview personally or referring LTC. Jastaniah to the specialized person(s) in your Ministry/Agency so that LTC. Jastaniah may be able to complete his studies.

Your time and attention is very much appreciated.

General

Mohammed S. Al-Hammad  
 Joint Chief of Staff

INTERVIEW SCHEDULE

1. The Third Five-Year Plan expresses the need for increasing the availability of national manpower as one of the major goals of the plan by placing an increased emphasis on education and training so that more human resources can be developed. Has your department incorporated this goal into its plan?

Yes \_\_\_\_\_  
No \_\_\_\_\_

- a) If yes, what are the major elements of this plan?  
Please outline.

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- b) Are developing and preserving the human resources included in this plan?

Yes \_\_\_\_\_  
No \_\_\_\_\_

- c) What are the major outlines of your human resources plan?

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- d) Is industrial accident prevention programs one of the plan elements?

Yes \_\_\_\_\_  
No \_\_\_\_\_

2. What does this department currently do in regard to industrial safety?

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3. What are the future plans of this department for industrial safety?

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4. Does this department provide safety training/education for its employees?

Yes \_\_\_\_\_  
No \_\_\_\_\_

If YES,

a) What is the nature of this training? \_\_\_\_\_

b) What is the name of the division that is responsible for training/education?

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c) Is it staffed with trained personnel in the practices and theories of industrial safety?

Yes \_\_\_\_\_  
No \_\_\_\_\_

If YES, what kind of training have they received? \_\_\_\_\_

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5. Does this department offer formal courses in industrial safety education/training?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6. Does this department cooperate or coordinate with other educational institutions in introducing or incorporating industrial safety courses in their curriculum?

Yes \_\_\_\_\_  
No \_\_\_\_\_

If YES, what are these institutions? \_\_\_\_\_

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7. Do you provide an educational or training program of any type?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_  
 If YES, what type of program? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
8. What do you recommend should be done to improve the status of industrial safety in the Kingdom?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
9. Which of the following items, in your opinion, should be adopted and implemented to improve the status of industrial safety?
- a) Strict government control and regulations \_\_\_\_\_.
  - b) Publication and distribution of industrial safety standards \_\_\_\_\_.
  - c) More participation and involvement by the government \_\_\_\_\_.
  - d) Incorporating industrial safety courses into the educational and training systems \_\_\_\_\_.
  - e) Comprehensive record keeping \_\_\_\_\_.
  - f) Research in occupational health \_\_\_\_\_.
  - g) Others (specify) \_\_\_\_\_.
10. In your opinion, and on the basis of your experience, what present department should be responsible for managing the industrial safety program or organization? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
11. Do you favor or recommend the establishment of an industrial safety organization as a new independent agency?  
 Yes \_\_\_\_\_  
 No \_\_\_\_\_
- a) If YES, what other departments should cooperate and coordinate in the activities?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

b) What other departments or agencies should cooperate with it?

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12. What department and agencies of the government are presently involved, one way or another, with industrial safety?

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13. Do you feel that this set-up is adequate and efficient?

Yes \_\_\_\_\_  
No \_\_\_\_\_

If NO, what do you recommend should be done? \_\_\_\_\_

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14. Is it the responsibility of this department to inspect industrial facilities?

Yes \_\_\_\_\_  
No \_\_\_\_\_

15. Do you have written standard procedures of inspections for the inspectors to follow?

Yes \_\_\_\_\_  
No \_\_\_\_\_

16. Are corrective measures taken in cases of safety violation?

Yes \_\_\_\_\_  
No \_\_\_\_\_

17. Do you keep accident records?

Yes \_\_\_\_\_  
No \_\_\_\_\_

If YES, are these for your department only or for the Kingdom?

Department only \_\_\_\_\_ Kingdom \_\_\_\_\_

FOR SCHOOLS ONLY

18. Does your institution have an identifiable Industrial Safety Management/Engineering curriculum?  
Yes \_\_\_\_\_  
No \_\_\_\_\_
19. Is the study of Industrial Safety Management/Engineering included in any study program leading to a degree in Business Administration/Engineering?  
Yes \_\_\_\_\_  
No \_\_\_\_\_
20. Does your institution have an identifiable course of study offering any area of accident prevention--technical or non-technical--in any of your study programs?  
Yes \_\_\_\_\_  
No \_\_\_\_\_

If YES, what is/are the title(s) of the course(s)? \_\_\_\_\_

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Please indicate the degree of your agreement or disagreement with each of the FOLLOWING statements. CIRCLE the number of the appropriate response using the scale under each item.

21. Industrial accidents are part of life and must be accepted as such by the authorities.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

22. Many of the present day occupational illnesses with which people suffer could not have been anticipated or avoided.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

23. A monetary value can be placed on human life and safety.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

24. The benefits of safety outweigh its cost.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

25. I personally believe that safety is the most important element of the working environment.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

26. I feel that private industry is adequately concerned with industrial safety.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

27. I think it is the responsibility of the government to develop and implement an industrial safety program for Saudi industry.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

28. I think promoting the safety program using all promotional activities and means available is essential for its implementation and acceptance by industry.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

29. I think that an industrial safety program is needed.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

30. I think that the government presently is doing an adequate job in preventing industrial accidents.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

31. I think there are presently too many industrial accidents taking place in the Kingdom.

strongly disagree	disagree	neutral	agree	strongly agree
1	2	3	4	5

32. Please provide the following information, as accurately as possible, for the last two years. (If no accurate record was maintained, please provide a reasonable estimate). Data is from: (check one)

Records \_\_\_\_\_

Estimate \_\_\_\_\_

	<u>1980</u>	<u>1981</u>	<u>N/A</u>
a) Number of work-related injuries	_____	_____	_____
b) Number of work-related injuries without lost workdays	_____	_____	_____
c) Number of work-related injuries with lost workdays	_____	_____	_____
d) Number of work-related illnesses	_____	_____	_____
e) Number of work-related illnesses without lost workdays	_____	_____	_____
f) Number of work related illnesses with lost workdays	_____	_____	_____
g) Number of disabling work injuries (no longer able to perform previous job)	_____	_____	_____
h) Number of fatal injuries (work-related)	_____	_____	_____

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



المرح ١٥/١٠/٢١  
التاريخ  
الرفقات  
الموضوع:

السلام عليكم ورحمة الله وبركاته :

المقدم مهندس / عبدالله رشاد جستنيه هو احد ضباط الدفاع الجوي المبتعثين حاليا للدراسة في جامعة شمال ايوا في الولايات المتحدة الامريكية لتلقي درجة الدكتوراه في التكنولوجيا الصناعية والمذكور حاليا في مرحلة كتابة رسالة الدكتوراه وعنوانها " التكنولوجيا والسلامه الصناعيه : دراسة تحليلية لادارة برامج السلامه الصناعيه في المملكه العربيه السعوديه " وجزء من متطلبات حصوله على هذه الدرجة تقضي باجراء اتصالات ومقابلات تتعلق برسالته مع المسؤولين في

نأمل تعاونكم في اعطاء الفرصة للقيام بالمقابلته شخصيا او احالة المقدم الجستنيه الى الاشخاص المختصين في حتى يتمكن من اكمال دراساته .

شساكرين لكم اهتمامكم وتقبلوا تحياتنا .

فريق اول

محمد الصالح الحماد  
رئيس هيئة الاركان العامه

جدول المقابله

(١) عبرت الخطه الخمسيه الثالثه عن الحاجه لزيادة وجود الطاقه البشريه الوطنيه كواحد من الاهداف الرئيسييه للخطه وذلك بالتركيز الزائد على التعليم والتدريب حتى يمكن ايجاد موارد بشريه اكثر . هل قامت ادارتكم بأدراج هذا الهدف في خطتها ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

اذا كانت الاجابه بنعم فماهي العناصر المهمه لهذه الخطه ؟ نرجو الايضاح .

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(٢) هل اشتملت هذه الخطه على تطوير الموارد البشريه والمحافظة عليها ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

(ب) ماهي العناصر المهمه لخطتكم للموارد البشريه ؟

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(ج) هل برامج الوقايه من الحوادث الصناعيه واحده من عناصر خطتكم ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

(٣) مالذي تقوم به هذه الإدارة حاليا بما يتعلق بالسلامة الصناعيه ؟

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(٣) ماهي المخططات المستقبلية لهذه الادارة بالنسبة للسلامة الصناعيه ؟

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(٤) هل تقوم هذه الادارة بالتدريب / التعليم على السلامة لموظفيها ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

اذا كانت الاجابة بنعم ،

(أ) ماهي طبيعة هذا التدريب ؟ \_\_\_\_\_

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(ب) ما هو اسم القسم المسؤول عن التعليم / التدريب ؟ \_\_\_\_\_

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(ج) هل القسم مزودا بأفراد مدربين في التمارين العمليه والنظريه للسلامة الصناعية ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

اذا كانت الاجابة بنعم ، فما هو نوع التدريب الذي تلقوه ؟ \_\_\_\_\_

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(٥) هل هذه الادارة تقوم بأعطاء دورات منتظمة في التعليم والتدريب على السلامة الصناعيه ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

(٦) هل تقوم هذه الادارة بالتعاون او التنسيق مع المعاهد التعليميه الاخرى في تقديم

او ادخال دورات السلامة الصناعيه في مناهجها الدراسية ؟

نعم \_\_\_\_\_

لا \_\_\_\_\_

اذا كانت الاجابة بنعم ، فماهي هذه المعاهد ؟ \_\_\_\_\_

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(٧) هل تقومون بأعطاء برنامج تعليمي او تدريبي من أي نوع ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

إذا كانت الاجابه بنعم فما هو نوع البرنامج ؟ \_\_\_\_\_  
\_\_\_\_\_

(٨) ماذا توصون بأن يجب عمله لتحسين وضع السلامة الصناعيه بالمملكه ؟ \_\_\_\_\_  
\_\_\_\_\_

(٩) ماهي الاشياء الاشياء التالية في رأيكم التي يجب اتباعها وتنفيذها في تحسين الوضع الراهن للسلامه الصناعيه؟ ( ضع علامة على جميع الاشياء التي ترونها مناسبه )

- (أ) رقابة وانظمة حكومية شديدة \_\_\_\_\_  
(ب) طبع وتوزيع مواصفات للسلامه الصناعيه \_\_\_\_\_  
(ج) مساهمة وتدخل اكبر من قبل الحكومه \_\_\_\_\_  
(د) ادخال دورات السلامة الصناعيه في الانظمه التدريبيه والتعليميه \_\_\_\_\_  
(هـ) حفظ شامل للسجلات \_\_\_\_\_  
(و) بحث في الصحه المهنيه \_\_\_\_\_  
(ز) غير ذلك (حدد) \_\_\_\_\_

(١٠) في رأيكم وعلى اساس خبرتكم ماهي الادارة الموجوده حاليا والتي يجب ان تكون مسؤوله عن ادارة برامج السلامة الصناعيه؟ \_\_\_\_\_  
\_\_\_\_\_

(١١) هل تحبذون او توصون بإنشاء هيئة سلامه صناعيه كوكالة حكوميه مستقلة ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

(أ) إذا كانت الاجابة بنعم ،فماهي الادارات الاخرى التي يجب ان تتعاون وان يتــــم التنسيق معها في نشاطات هذه الوكاله ؟ \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(ب) ماهي الادارات او الوكالات الاخرى التي يجب ان تتعاون معها ؟

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(١٢) ماهي الادارات والوكالات الحكوميه حاليا التي لها علاقة بطريقة او بأخرى،بالسلامه الصناعيه؟

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(١٣) هل تشعر ان هذا الوضع يعتبر كافي ووافي ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابه بلاء ماذا توصي ان يتم عمله ؟

(١٤) هل من مسؤلية هذه الادارة القيام بتفتيش المنشآت الصناعيه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

(١٥) هل لديكم اجراءات اساسيه مكتوبة للتفتيش ليقوم المفتشون باتباعها ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

(١٦) هل هناك اجراءات تصحيحية يتم اتخاذها في حالة مخالفة السلامه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

(١٧) هل تحتفظون بسجلات للحوادث ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابة بنعم هل هذه لادارتكم فقط او للمملكه ؟

لادارة \_\_\_\_\_ للمملكه \_\_\_\_\_

للمعهد الدراسية فقط

١٨) هل لدى معهدكم برنامج دراسي معرف لادارة / هندسة السلامة الصناعيه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

١٩) هل دراسة هندسة / ادارة السلامة الصناعيه مدرجة ضمن اي برنامج دراسي يؤدي الى الحصول على درجة في ادارة الاعمال / الهندسه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

٢٠) هل لدى معهدكم كورس دراسي معرف يقدم اي مجال للوقاية من الحوادث - فنية اوغير فنية - في اي برنامج من برامج الدراسه ؟

نعم \_\_\_\_\_  
لا \_\_\_\_\_

اذا كانت الاجابة بنعم ،فماهي عناوين هذه الكورسات ؟

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نرجو ايضاح درجة موافقتكم او عدم موافقتكم مع كل افادة من الافادات التالية ، وذلك بوضع دائرة حول الرقم المناسب لاجابتكم باستخدام معدل الدرجات تحت كل افادة .

(٢١) الحوادث الصناعية جزء من الحياه ويجب قبولها على هذا الاساس من قبل المسؤولين .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٢) العديد من الامراض المهنية التي يعاني منها الناس حاليا لم يكن بالامكان توقعها وتفاديها .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٣) بالامكان وضع قيمة نقدية لحياة الانسان والسلامه .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٤) ان فوائد السلامه تفوق تكاليفها .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٥) السلامه هي اهم عنصر في بيئة العمل .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٦) الصناعات الوطنية مهتمة اهتماما كافيا بالسلامه الصناعية .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٢٧) تقع على الحكومة مسؤولية احداث وتطوير وتطبيق برنامج سلامة صناعي للصناعات السعودية .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٢٨) ترويج برامج السلامة بأستخدام كافة النشاطات الترويجية والوسائل المتوفرة يعتبر  
عنصرا جوهريا لتنفيذها وقبولها من قبل الصناعه .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٢٩) هناك حاجة الى برنامج سلامه صناعيه .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٣٠) تقوم الحكومة حاليا بواجب كافي في الوقاية من الحوادث الصناعية .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

٣١) يوجد حاليا حوادث صناعية كثيرة جدا تحدث بالمملكه .

لاوافق بشدة	لاوافق	محايد	وافق	وافق بشدة
١	٢	٣	٤	٥

(٣٦) نرجو توفير المعلومات الآتية مع تحري الدقة بقدر الامكان عن السنتين الماضيتين.  
 ( اذا لاتوجد سجلات دقيقة ، نرجو توفير تقديرات معقولة ) .  
 البيانات من : ( ر ضع علامه على احد الاختيارين ) سجلات \_\_\_\_\_  
 تقديرات \_\_\_\_\_

١٩٨٠	١٩٨١	فسي هذه المؤسسة :
_____	_____	(١) عدد الاصابات المرتبطة بالعمل
_____	_____	(٢) عدد الاصابات المرتبطة بالعمل بدون ضياع ايام العمل
_____	_____	(٣) عدد الاصابات المرتبطة بالعمل مع ضياع ايام العمل
_____	_____	(٤) عدد الامراض المرتبطة بالعمل
_____	_____	(٥) عدد الامراض المرتبطة بالعمل بدون ضياع ايام العمل
_____	_____	(٦) عدد الامراض المرتبطة بالعمل مع ضياع ايام العمل
_____	_____	(٧) عدد الاصابات في العمل التي أدت الى عجز(عدم تمكن الموظف من القيام بالعمل السابق )
_____	_____	(٨) عدد الاصابات المميتة والمرتبطة بالعمل