IMPROVING SAFETY PERFORMANCE
IN CONSTRUCTION SITE OPERATIONS IN THE UNITED ARAB EMIRATES

A Thesis
Presented in Partial Fulfillment of the Requirements for
The Degree Master of Civil Engineering in the
Graduate School of The Ohio State University

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2001

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ABSTRACT

Construction related work is one of the world's most dangerous occupations making construction safety of paramount importance. This is particularly true in countries that have rapidly growing economies. These countries are engaged in a large number of construction projects where frequently construction workers are foreign nationals who do not speak the language of the country where they are working. Although many researchers have investigated the field of construction safety, few have focused on these special problems.

The United Arab Emirates (UAE) is considered one of the fastest growing and most developed countries in the Middle East. Despite this fact, construction safety has not been seriously considered, and construction workers are threatened by possibility that a serious or fatal accident may occur while performing their job. Construction companies in the UAE value saving human lives and want to control the rising costs of accidents and reduce project delays due to accidents, but they don't know where to start. This study has the objective of assessing construction safety in the UAE and serves a first step in initiating a comprehensive safety program.

This study is an overall evaluation of the UAE construction safety performance based on both a literature review and survey of construction company safety performance and attitudes. The literature review covers previous studies about safety in the UAE
construction industry, the nature of the construction industry, as well as case studies of construction site accidents. An evaluation of the United Arab Emirates Federal Law No. 8 (labor law) is also included in the review so as to establish a basis for judging the quality of safety regulations and codes in construction industry. The survey of construction contractors in the UAE is used to gather information not available in the literature on individual company performance.

Despite the fact that the United Arab Emirates is a highly developed country, it lacks regulations and codes necessary for construction operation safety. The findings of this study, suggest that significant reforms are needed to establish either a new organization that will serve as an authority to guard and monitor safety in construction as well as other industries in the UAE, or alternatively, develop the current system into a more comprehensive one that will guard and regulate safety and health for all the industries in the UAE and especially the construction industry.
Dedicated to my mother
ACKNOWLEDGMENTS

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I thank my committee members, Drs. Duane and Gozon, for their suggestions and support.

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Branch.

Special thanks go to my father, Salem Saeed Aikaabi, the man who supported me throughout my graduate studies and made my dreams come true, and to my mother whose prayers and heart were with me all the way.
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A Tabular Knowledge Base Approach”, Third International conference on construction

FIELDS OF STUDY

Major Field: Civil Engineering
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LISTS OF ABBREVIATIONS

AGCC    Arabian Gulf Countries' Council

CSHO    Compliance Safety and Health Officer

Dh.     Dirham (UAE Currency) (US$ 0.37)

GDP     Gross Domestic Product

MEED    Middle East Economic Digest

MSDS    Material Safety Data Sheet

OSHA    Occupational Safety and Health Administration

PPE     Personal Protective Equipment

SASO    Saudi Arabia Standards Organization

UAE     United Arab Emirates
CHAPTER 1

INTRODUCTION

1.1 Description of the Problem

Until recently, safety on construction job site has been ignored by construction companies worldwide particularly in countries where the construction labor force is primarily composed of laborers from foreign countries. Due to the increasing number of reported accidents and injuries on construction projects, safety is becoming an important issue in today's construction environment. Ideally, by creating a culture of safety with a goal of zero job related injuries, the construction industry could move from being one of the most hazardous industries to one of the safest. In the United States, the interest in improving construction site safety is concerned with saving human lives, controlling the rising costs of workers’ compensation and medical treatment, and reducing the Occupational Safety and Health Administration (OSHA) fines.

The United Arab Emirates is one of the most rapidly progressing Middle Eastern countries in the construction industry. The people of the United Arab Emirates are proud of their leadership position in international architecture and would like to make construction safety an issue of national pride as well. This raises questions of the nature
of safety in construction operation in the United Arab Emirates and the suitability of safety programs, if available, to the growing construction industry.

A well-known contractor said, "God will help him" concerning one of his workers who was severely injured. No one on site was capable of taking this worker to the hospital but my father. The worker was paralyzed from the waste down and could not return to his job. This accident and many others like it occur in the United Arab Emirates, not because of lack of compassion for the injured workers but because both workers and management lack knowledge of safe constructing practices. No significant study has been made of construction safety in the United Arab Emirates that addresses the unique concerns of a rapidly growing economy where the construction labor force is largely foreign.

1.2 Objective of The Study

This study addresses the unique concerns of the rapidly growing economy of the United Arab Emirates with a largely foreign construction labor force. This study is an evaluation of safety performance in construction industry operations in the UAE with the goal of creating a culture of safety in the UAE construction industry. This goal is to be achieved, in part, by establishing enforcing a comprehensive safety code and safety practice policy in the UAE. A comprehensive study is required to evaluate the safety performance in construction operations to lay the groundwork for a comprehensive safety code. The objective of this study is to assess safety in construction operations in the UAE. This assessment was conducted in terms of evaluating the current safety
performance in the country, studying the laws that enforce the current safety performance, and suggesting strategies that can improve safety. Although accident costs as well as accident classification are a part of this study they are not the main objective of this study.

To achieve the required objectives, several tasks were conducted. The first task is assessment of the state of the UAE construction industry by means of an overall literature study of the construction safety. The second task is aimed at gathering information not available in the literature by developing and administering a construction safety survey of a representative sample of UAE construction companies. The third task is a qualitative analysis of information obtained through the survey and the literature review. Finally, the implications of the findings as they relate to developing a culture of safety in the UAE construction industry are presented.

1.3 Significance of the Study

The significance of this study emerges from the need to establish a culture of safety that will ultimately save human lives, decrease the time allotted to construction projects, and reduce construction operation costs.

A major issue of this study is saving human life. There is no measure or value for a human being's life. So this value or goal transcends all other goals and objectives. To achieve this goal construction contractors must be:

1. Educated in the practice of construction safety.
2. Made aware that good safety practices benefit productivity, help reduce construction
operation time by avoiding delays that result from accidents, and ultimately help decrease the cost of these accidents and meet the project budget.

3. Required to use good safety practices through a code enforced by incentives and penalties.

1.4 Limitations

This study will focus only on the safety of construction industry operations in the United Arab Emirates (UAE). A limited study of other neighboring countries was conducted to obtain information about the existence of occupational safety and health organization.

1.5 Organization of the Report

This study is divided into five chapters. The first chapter describes the problem, the objective of the study, and the significance of the research. The second chapter is a literature review that provides an overall picture of the construction industry as well as construction operation accidents in the United Arab Emirates. The third chapter provides information on construction safety in the UAE. It also discusses the UAE Federal Labor Law No.8 (labor law) and construction safety organizations. The fourth chapter is an analysis of the survey conducted to evaluate construction contractors' safety performance. Detailed analyses along with conclusions are provided.
The final chapter includes the conclusion and results of the study. Recommendations are made for improving construction safety in the United Arab Emirates and establishing a safe industry.
CHAPTER 2

STATEMENT OF THE PROBLEM

2.1 Introduction to the Section

UAE is a member of the Arabian Gulf Countries' Council (AGCC), and one of the highly developed countries in the region. With the development of building techniques, the trend toward innovative buildings, and the need for innovative construction methods, the degree of construction safety is in question. This chapter describes the construction industry in the UAE and discusses some recent construction site accidents.

2.2 Construction Industry

With a growth of 10% per year, from 1997 to 2000, in Gross Domestic Product (GDP), the UAE has one of the fastest developing economies among AGCC countries (see Table 2.1). The non-oil sector of the GDP in 1999 was Dh 141.7 billion ($ 38.3 billion).
The share of construction industry varied from (9%-10%) from 1998 to 1999. This percentage is equivalent to billions Dh (3.45-3.83) according to the Ministry of Planning (See Figure 2.1)

Figure 2.1: Gross domestic product of the UAE by sector (www.UAEforever.com).

A report published by the Middle East Economic Digest (MEED) mentioned that by regional standards, the UAE construction industry is healthy and that contractors can look
forward to some sizeable opportunities in the near future. The report also emphasized the fact that intense competition in the construction was stimulated by the fact that $6 billion worth of contracts are expected in the construction market per year. The country had a labor force of 1.3 million in 1998, according to the Ministry of Labor and Social Affairs, with the construction industry employing about 19% of the total labor force, which amounts to 247,000 workers. As for the nationals, they form 15.3% of the total construction labor force, which is equivalent to 37,791 workers, see Table 2.1 and Figure 2.2 for statistics showing the increase in the total construction force over the last fifteen years.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Construction Workers</th>
<th>Total Labor Force</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>112,599</td>
<td>675,989</td>
<td>16.65%</td>
</tr>
<tr>
<td>1995</td>
<td>253,794</td>
<td>1,311,816</td>
<td>19.34%</td>
</tr>
<tr>
<td>2000</td>
<td>344,179</td>
<td>1,779,000</td>
<td>19.34%</td>
</tr>
</tbody>
</table>

Table 2.1: The total construction work force in comparison to the total labor force in the country (The Ministry of Planning, 2000).
Figure 2.2: The increase in construction work force over the past fifteen years (The Ministry of Internal Affairs, Planning Department, 2000).

A typical Construction worker salary ranges between Dh. 400-800, (US$108-217) per month. Most of the construction workers are from India and other Asian countries. It is rare to find construction workers (on site workers) from the UAE.
2.3 Construction Accidents

Although the construction industry is one of the fastest growing sectors in the country, construction operation appears to be unsafe. According to the Statistics Bureau of the Ministry of Internal Affairs (1999), the number of injuries or deaths in the workplace because of negligence was the highest among the others accidents forming 33.4% of the total violations of the Federal law No.8 (labor law) (see Table 2.1) and the number of falls from elevated areas comprised 2.4% of the total accidents in 1999 (see Table 2.2). According to the nationality of the workers violating the Federal law No.8 (labor law), 34.5% of the violators were Indians followed by workers from Pakistan (24.8%) and Bangladesh (17.3%). Arab workers had no violations of the labor law of the year 1999 according to the bureau of Statistics of the Ministry of Internal Affairs (see Table 2.3). The language barrier and the level of education could explain these percentages.
<table>
<thead>
<tr>
<th>Article No.</th>
<th>Article</th>
<th>No. Of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Employment of Underage Persons</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Employment of Underage Persons in Industrial Projects</td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>Employment of Women at Night</td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>Employment of Women in Dangerous or Immoral Jobs</td>
<td>-</td>
</tr>
<tr>
<td>91</td>
<td>Exposing Workers to Work Dangers</td>
<td>-</td>
</tr>
<tr>
<td>91</td>
<td>Deaths or Injuries Due to Negligence</td>
<td>426</td>
</tr>
<tr>
<td>114</td>
<td>Negligence of Workers Rights</td>
<td>-</td>
</tr>
<tr>
<td>124</td>
<td>Termination of Contracts of Employment Severance</td>
<td>-</td>
</tr>
<tr>
<td>128</td>
<td>Leaving Work</td>
<td>125</td>
</tr>
<tr>
<td>129</td>
<td>Leaving Work without Contract Termination</td>
<td>708</td>
</tr>
<tr>
<td>142</td>
<td>Failure to Report Accidents</td>
<td>-</td>
</tr>
<tr>
<td>144</td>
<td>Failure to Pay Treatment cost</td>
<td>-</td>
</tr>
<tr>
<td>144</td>
<td>Divulges Secrets of Work</td>
<td>-</td>
</tr>
<tr>
<td>185</td>
<td>Failure to Fulfill Employer Obligations</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1276</strong></td>
</tr>
</tbody>
</table>

Table 2.2: Numbers of labor law violations of 1999 (Bureau of Statistics, the Ministry of Internal Affairs, 1999).
<table>
<thead>
<tr>
<th>Type of Accident</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Trapped children</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Buildings collapse</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sand failure</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>346</td>
</tr>
<tr>
<td>Car accidents</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>Elevators breaking out</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Fainting</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Asphyxiation</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Suicide</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>52</td>
</tr>
<tr>
<td>Run over</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Falls</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>95</td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>610</strong></td>
</tr>
</tbody>
</table>

Table 2.3: Number of accidents in 1999 (Bureau of Statistics, the Ministry of Internal Affairs, 1999).
<table>
<thead>
<tr>
<th>Nationality</th>
<th>No. of Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>10</td>
</tr>
<tr>
<td>Pakistan</td>
<td>288</td>
</tr>
<tr>
<td>India</td>
<td>401</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>201</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>14</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>104</td>
</tr>
<tr>
<td>Philippines</td>
<td>12</td>
</tr>
<tr>
<td>Other Asians</td>
<td>18</td>
</tr>
<tr>
<td>Africans</td>
<td>1</td>
</tr>
<tr>
<td>UK</td>
<td>1</td>
</tr>
<tr>
<td>Other Europeans</td>
<td>1</td>
</tr>
<tr>
<td>USA</td>
<td>0</td>
</tr>
<tr>
<td>Other Americans</td>
<td>0</td>
</tr>
<tr>
<td>Australia</td>
<td>0</td>
</tr>
<tr>
<td>No Nationality</td>
<td>3</td>
</tr>
<tr>
<td>Arabs</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1161</strong></td>
</tr>
</tbody>
</table>

Table 2.4: Nationalities of labor law violators (Bureau of Statistics, the Ministry of Internal Affairs, 1999).

In a study done by the Ministry of Labor and Social Affairs (2000-2001), 56.3% of the study sample, which included construction and other industries, did not keep records of accidents. Some companies did not even report any accident to the Ministry of Labor, which made it hard to identify accidents and their causes. According to the same study, 86.3% of the sample had no accidents, but the majority of the accident occurred in the construction industry (see Table 2.5).
<table>
<thead>
<tr>
<th>Occupations vs. No. Of accidents</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>9</th>
<th>14</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quarry</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Industry</td>
<td>143</td>
<td>9</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Construction</td>
<td>77</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Commerce</td>
<td>9</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Financing</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Services</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>251</td>
<td>21</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2.5: Occupation types versus the number of accidents (The Nature of Occupational Health and Safety in UAE, 2000-2001).

Although the Ministry of Labor and Social Affairs provides a special form for accident reporting, there has been insufficient response among the involved parties. The Ministry of Labor statistics reveals that 56.7% do not have the required form. Only 6.5% of the total sample reported accidents, and 23% did not report accidents at all. At the same time, the majority of the reported accidents are simple injuries (see Table 2.6) and about 82.9% of these accidents occurred during working hours.
<table>
<thead>
<tr>
<th>Type of Accident</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Injury</td>
<td>78</td>
<td>66.6</td>
</tr>
<tr>
<td>Medium Injury</td>
<td>11</td>
<td>9.4</td>
</tr>
<tr>
<td>Severe Injury</td>
<td>5</td>
<td>4.27</td>
</tr>
<tr>
<td>Car Accident</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>Death</td>
<td>3</td>
<td>2.56</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>16.23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>117</td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 2.6: Types of accidents in terms of severity (The Nature of Occupational Health and Safety in UAE, 2000-2001).

2.4 Examples of Recent Construction Accidents in the UAE

The first accident reveals the ignorance of some construction companies. It occurred on November 6th, 2000. The accident happened when eleven construction workers, carrying heavy iron pieces went up together in a construction elevator. The elevator fell from the seventh floor of a 16-storey building, which was under construction due to exceeding the allowed capacity of the elevator (Gulf News Online, 2000). Six workers died and five were severely injured. All the injured workers had multiple leg fractures, abdominal and head injuries. Following this accident, construction companies were ordered to improve safety at construction sites by the Ministry of Labor and Social Affairs. According to the ministry, 28 workers were killed or injured in industrial
accidents in 2000. A ministry source said that this figure underestimates the real situation due to the fact that workers do not report accidents unless they are serious (Gulf News Online, 2000).

Another accident, reported on January 20th of 2001, indicates that some construction firms ignore regulations about excavation near gas pipelines. A petroleum engineer claimed that some companies wait until dark to start excavation. The companies involved have been reported and the offences registered, but these companies continue to excavate when the inspectors are not around. Insurance companies also declared that they would not cover the liability resulting from ignoring safety procedures. However, the petroleum engineer admitted that the maps of the pipeline network were not given to construction companies for security purposes and could not be provided for future construction work (Gulf News online, 2001).

Another horrific accident occurred on April 4th, 2001. Three workers died due to carbon monoxide and other gas exposure while cleaning a sewer pipe. None of the workers was wearing any respiratory equipment. A second accident, occurring three weeks later, involved three workers who died as a wall collapsed on them. The concrete wall, as the director of Dubai Police Transport and Rescue Department said, consisted of two layers each weigh around a ton. The workers were having breakfast in the shade of the wall. The contractor was blamed for not providing a safe place for the workers to eat (Gulf News & Kaleej Times 2001) (see Figure 2.3).
Figure 2.3: *The collapsed wall that killed three workers (Alkaleej, May, 2001)*

The practice of not providing safe resting areas or shelters for workers can also be seen in *Figure 2.4*, a photo showing construction workers having lunch in the middle of the site in a cable case in Deira, Dubai.
Figure 2.4: A candid camera picture (Weekend, August 17-23, 2001).

In another recent case, sixteen workers were treated for heat stroke in Ras Alkimah. These workers were working under the direct sun heat (Alkaleej, 26 July 2001).

Another accident occurred on August 9th, 2001 when a crane collapsed during the demolition of nine storeys building in Abu-Dhabi. Parts of the crane as well as the heavy iron piece used for demolition rested behind the building closing a service road. The investigation showed that the old crane fell due to the lack of the necessary routine maintenance. No one was injured (see Figure 2.5). Another accident happened the same
week involving three workers who got caught in a crane on the fifth floor of a building. 

The cause of this accident was a technical problem in the crane. Ignoring the routine maintenance of the crane was also the main reason for this accident (Alkaleeaj, August 10, 2001).

Figure 2.5: The collapsed crane after the accidents as shown on the newspaper (Alkaleeaj, August 10, 2001).
Only fourteen days after the previous accident a wooden workers' residence as well as the company storage facility caught fire late in the night. No one was injured and the Civil Defense is investigating the accident (Alkaleej, August 24, 2001) (see Figure 2.6).

Figure 2.6: The workers housing after the fire as shown in a newspaper photo (Alkaleej, August 10, 2001).
On the other hand, the Dubai Municipality alone fined 681 firms last year for violating pollution control regulation and the safety unit made 1,285 inspections, 580 of which were for construction sites and 24 of which were follow up visits to accident sites.
CHAPTER 3

BACKGROUND AND PROCEDURES

3.1 Introduction to the Section

As the main objective of this research is evaluating UAE construction safety performance, some background information about the construction environment in the UAE is necessary. This chapter provides an overview of the UAE Federal law No.8 (labor law), which regulates construction as well as other industries. Additionally, new labor laws in the making are discussed. It will also compare the UAE Federal law No.8 with OSHA regulations and with safety organizations in other neighboring countries. This chapter also includes a brief description of a study done by the Ministry of Labor and Social Affairs called "The Reality of Occupational Safety in the UAE" (see Section 3.5), the Ministry of Public Work and Housing role in safety and the UAE university initiatives in safety.

3.2 The UAE Federal Law No. 8 (labor law)

The Federal Law No.8 of 1980 regulates labor relations (Federal Law No.8 of 1980). This law was improved in 1981 and 1985 respectively and several amendments
have been issued throughout the proceeding years as needed. The law consists of thirteen main parts in addition to other sections and schedules. In this section, a description of each section of the UAE Federal Law No.8 will be covered. In addition, a detailed description of the sections concerning construction industry is provided.

The first part of the law includes the definitions and general provisions of the law. The definition section covers the different terms used throughout the labor law. Examples are employer, worker, contract of employment, and employment injury. The general provisions section consists of six articles, each of which addresses different issues of employment. Some of these issues are the language to be used, categories not applicable to the law, salaries, legal cases, disputes, and the calendar used in the law.

The second part of the law regulates the employment of workers, underage persons, and women. It consists of four chapters. Chapter One regulates the employment of workers in terms of nationality, employment of national and employment licenses. Chapter Two regulates the employment of underage persons while chapter three regulates the employment of women. Chapter Four is a common provision for the previous chapters of this section.

The third part of the UAE Federal Law No.8 regulates the contracts of employment, records and remuneration. This part consists of four chapters that regulate individual contracts of employment, vocational training contract, records and files, and remuneration respectively. The fourth part of the law contains two chapters of laws that regulate the hours of work as well as worker leaves.

The fifth part is one of the most important parts of the law because it controls industrial safety, protective measures, and health and social care for workers. It includes
eleven articles that control different aspects as follows. The first article provides regulations of the provision of suitable means of protection against injuries and occupational diseases by the employer. It also emphasizes the use of safety equipment and clothes by the employees and orders the employees to follow the employer's instructions aimed at protecting him or her. The second article requires the employer to display detailed instructions of fire prevention and fire protection in a permanent place on the job site. The third article requires the availability of a first aid kit on the job site and specifies in detail the minimum contents of the kit. The fourth article regulates the preservation of a clean well-ventilated job site, the provision of suitable lighting and water suitable for drinking in addition to toilets. The fifth through the seventh articles enforce the assignment of one or more physician to examine employees who are exposed to occupational diseases at least once every six months. The eighth article enforces the prohibition of alcoholic drinks on job site as well as forbids any person under the influence to enter a job site or work establishment. The ninth article orders each worker to comply with the instructions and orders regarding safety precautions. It also prohibits any worker from misusing the personal protective equipment or damaging them. It allows also the employer to impose penalties on workers who fail to obey the above rules. The tenth article regulates the provision of means of transportation, accommodations, food, drinking water, first aid services, and means of entertainment for employees at a remote area. This article also specifies the regions of the country considered as remote areas.

The sixth part of the law covers disciplinary rules. It includes eleven articles regulating the different aspects of the disciplinary rules. Examples are the disciplinary
penalties that the employer may impose, disciplinary code and the types of fines that could be imposed on workers.

The seventh part of the Federal Law No.8 deals with the termination of contracts of employment and severance pay.

The eighth part controls the employment compensation as well as the accidents and occupational diseases. The first article of this part requires the reporting of work accidents and occupational diseases to the police and labor department. Other articles regulate the prosecution of the employer, compensation for the employee and his family, the wages paid for the employee during his treatment, and the compensation for the employee's death or disability in details. It specifies the injuries and disability types and ratings as well as the compensation amounts.

The ninth part of the law regulates the collective labor disputes, the disputes between an employer and his workers, in twelve chapters.

The tenth part of the law controls the labor inspection in fourteen sections. It contains the inspection procedures, inspectors' training, duties, and rights.

The eleventh part of the law stipulates penalty types, amounts, and employer's rights and role in these penalties.

The twelfth part is a concluding provision of the law followed by schedules listing the occupational diseases, assessment of compensation for permanent disability and the distribution of compensation in respect of death among the workers' family.

The thirteenth part of the law contains all the ministerial orders that specify and detail all the previous parts of the labor law. These orders were issued in different years following the Federal Law No. 8 (labor law).
The ministerial order no. (44/1) of 1980 specifies in detail the rules of labor inspections. This order describes the powers of the inspectors, the functions of labor inspection administration, the manners of inspections in terms of inspection routes, inspection visits, inspector’s duties and oath, registration of inspections, and reports.

Ministerial order no. (28/1) of 1981 lays out a guide for employees in making disciplinary code.

Another important order is order no. (32) of 1982, which determines the preventive methods and measures for the protection of workers from occupational risks. This order requires the following:

- The provision of appropriate preventive measures for the protection of workers from risks of injuries and occupational diseases.
- The notification of occupational risks (fire, falls, machinery) for every employee.
- The assignment of a specialist in first aid treatment for each workplace.
- The insurance of suitable workplace and conditions in terms of:
  a. The space assigned for each worker should not be less than 400 cubic feet.
  b. The provision of sufficient amount of clean air, and the elimination of all harmful air and gases.
  c. The provision of appropriate lighting specifying in detail the appropriate lighting level according to the type of activity.
  d. The reduction of noise that may endanger the workers.
  e. The provision of a place for meals.
  f. The provision of adequate washing basins.
Another article under the same order determines the conditions that should be fulfilled at the workplace to be considered a safe working place. These conditions include the following:

a. An even surface of suitable material for the floor of the work place.
b. A sufficient space around machinery for workers to pass and operate the machinery safely.
c. All the passages to be protected against tripping, slipping, and falls.
d. All the passages to be free from obstacles that may cause accidents.
e. All the staircases and ramps to be made of non-slippery materials.
f. All the staircases to have side railings made of bars at narrow distance to prevent object passing.
g. All the staircase steps to have sufficient strength, width for safe passage, and railings on both sides.
h. All mobile ladders to have adequate strength and suitable dimensions. The top and base should be designed to reduce fall accidents. All wooden ladders should not be painted.

The next article of the same order provides guidelines for fire prevention. It covers exit requirements, fire extinguishers, fire alarms and warning signs. Another article deals with falls. It orders the provision of protection against falling, falling objects, flying metals, sharp bodies, liquids or other materials. It also requires the provision of protective glasses, gloves, belts, uniforms, masks, and other personal protective equipment necessary to protect workers from work dangers and risks. This order also
includes articles regulating the protective barriers around the mobile parts of generators, motors, or machinery. It gives guidelines and conditions for the barriers that should be used.

There are several articles concerning construction work. These articles regulate digging and demolition work. They regulate and specify requirements for trench digging, the disposal of excavated material, and demolition procedures. They also control scaffolding in terms of dimension, fall protection equipment, shafts regulations, shelters from falling objects, hoisting, and towing requirement. Other sections regulate elevators, chains and towing wires and addresses the responsibility of providing personal protective equipment and insuring a safe workplace.

Other laws and orders concerning the construction industry and labor were issued in previous years. A regulation concerning noise pollution from construction and demolition sites was issued in 1991 to protect people in neighborhoods adjacent to construction sites (Khaleej Times 1999). A new rule that started to be enforced as of April 1st 2001 regulates construction labor transportation. The rule states that labor should be transported in buses instead of pick-up trucks. On the first day of enforcing this law, 40 vehicles were seized and confiscated for a week. A fine of 100Dhs ($30) was imposed on violating vehicles. The construction workers used to be packed into a truck, which made trips to several construction sites. These pick-up trucks have iron seats and poor ventilation, thus the workers suffer terribly during the summer, see Figures 3.1,3.2 and 3.3. According to a report published by Gulf News, 30 workers died and 340 were injured, 16 seriously in accidents involving trucks hauling workers in year 2000.
Figure 3.1: Construction workers transported in a pick-up truck (Gulf News online, 2000).
Figure 3.2: The vehicles seized on the first day of enforcing the law, (Gulf News online, 2001).
Figure 3.3: Construction workers using buses after enforcing the law. (Gulf News online, 2001)

In addition to the UAE Federal Law No.8 (labor law) and the newly issued laws, there are some new laws that are still in the making.

One of these laws is one that aims to enforce safety and inspection conditions on various buildings and construction sites. Under this law construction consultants will have to submit planning applications and obtain approval of the Civil Defense Department before starting construction.
Other efforts are pushing towards a federal building law, which will control the growing construction industry. The Ministry of Public Works and Housing has been notified of the need for a federal code for the construction industry. This code will be implemented by the creation of an authoritative body or agency that will enforce the regulation and also a central monitoring agency that will control the implementation of the code (The Kaleej Times, 12th Feb. 2001).

According to a source in the Ministry of Labor and Social Affairs, the ministry will allocate a major part of its future budget for the development of several projects, including labor inspection development. This project includes assigning business administration graduates as inspectors and training the existing staff for better performance.

3.3 UAE Federal Law No.8 vs. OSHA

In order to evaluate the UAE Federal Law No.8 (labor law) in terms of construction safety, a comprehensive comparison with another, very well established, labor safety law and/or safety organization is necessary. The Organizational Safety and Health Administration (OSHA) was chosen for the comparison because it is a well-established and well-known safety organization. The objective of this comparison is to highlight the UAE Federal Law No.8 sections, which failed to meet the required degree of safety and to establish a basis for future modification and improvement where necessary. This comparison consists of four main parts: safety requirement, work accidents, labor inspection, and worker compensation.
The first part of the comparison concerns safety requirements. OSHA regulates the occupational safety and health applicable to all industry; UAE Federal Law No.8 regulates virtually all workers in the country. UAE Federal Law No.8 does not regulate staff and workers employed by federal government, armed forces, police and security units, agriculture workers as well as industrial workers. OSHA has around 26 detailed safety subdivisions for different safety categories. UAE Federal Law No.8 has 13 parts, three of which regulate safety. These parts are industrial safety, preventive measures, health and social care for workers, compensation in respect of employment accidents and occupational diseases, and labor inspection. In addition to other orders that describe several issues in detail regarding safety as were described earlier. The noticeable thing about the labor law is that it requires the provision of means of protections from hazards, fire and occupational diseases, and injures on the work site without specifying which means are to be used with which activities. There are no articles under the Federal Law No. 8 (labor law), which regulate concrete and masonry construction and steel erection. Other missing regulations concern tunnels, caissons, cofferdams and the use of explosives, power transmission and distribution. It includes sections about electrical hazards, scaffolding, excavations, elevators, cranes and other machinery as well as shafts, demolition and stairways and ladders.

The second part of the comparison deals with work accidents. For OSHA, employers have to fill a form for occupational illness and injures provided by OSHA. All accidents and injuries should be reported to OSHA too. For the UAE federal Law No.8, any accident should be reported immediately to the police and to the Ministry of Labor.
The police should carry out the necessary inquiries and the labor department may carry out a supplementary inquiry if necessary. The employer may be prosecuted if he or she were at fault or negligent.

Concerning workers' compensation, in the USA workers compensation covers all work related accidents and injuries. For the UAE, as specified and required by the Federal Law No.8 (labor law), the employer should pay the cost of the worker treatment including hospital, surgical operation, x-rays and laboratories, medicine and rehabilitation equipment, and artificial limbs when necessary. The employer should also pay the transportation expenses entailed by treatment and any travel expenses if the treatment is not available in the country. The law also regulates the compensation that should be paid for the worker if his injury prevents him from pursuing his work or if the worker died due to a work accident or occupational disease.

In the area of worker inspections, for OSHA the inspection is done by a CSHO, a compliance safety and health officer. There are two kinds of inspections that can be done, a comprehensive inspection and a partial inspection, which focus on certain potential hazard areas. In the UAE, inspection is carried out by an officer from the inspection unit in the Ministry of Labor and Social Affairs. The inspector has the right to enter any establishment at any time during day or night without notice, provided that the entry is done during work hours. The inspector also has the right to conduct any test or investigation necessary. He or she has the right to question and examine corporate records. All the above is also applicable to the OSHA investigator, in addition to taking photographs and videotaping. From the above comparison, we can conclude some characteristics of the UAE Federal Law No. 8 (labor law) as follows:
1. Although there are some laws specified for the construction industry, the UAE Federal Law No.8 (labor law) is very general, it does not specify any trade, but rather addresses all the applicable trades in general.

2. There are neither detailed specifications for personal protective equipment nor specification of the type of activity that requires them. The Law states only the need to provide “suitable means of protection,” which can be determined by the employers themselves.

3. There are some missing hazards and safety regulation that need to be considered. Examples are concrete and masonry work, steel erection, tunnel construction, and the use of explosives, electricity and others.

In summary, the overall UAE Federal Law No.8 (labor law) is very general in terms of safety and hazards. The law needs to be more detailed and should provide specifications according to the different trades and type of activity performed and different potential hazards on the work place in general and on construction sites in particular.

3.4 UAE vs. Other Neighboring Countries.

Due to the importance of this study, it is essential to investigate the construction safety practice situation in the neighboring countries. This section was originally intended to be a comparison in terms of safety in construction industry and accidents, but due to the lack of adequate resources and the difficulty of obtaining data regarding accidents, the comparison is limited to an examination of the extent of occupational safety and health.
organizations. The data gathered were from three neighboring countries of the UAE. These countries are the Kingdom of Saudi Arabia, Qatar, and Bahrain. Information about Oman and Kuwait could not be obtained. These five countries, in addition to the UAE, form what is known as the Arabian Gulf Countries Council (AGCC).

In the Kingdom of Saudi Arabia, there is no government organization specializing in administering occupational safety and health. The Ministry of Labor and Social Affairs regulates employee relations. Another organization that exists in Saudi Arabia is the Saudi Arabia Standards Organization (SASO). This organization was established on 1972 and is responsible for determining and enforcing approved standards and codes of services, facilities, utilities and products within the Kingdom of Saudi Arabia. The organization has 33 specialized sectors of standards, one of which specializes in civil engineering. The organization also provides services for training workers.

In Qatar, the situation is similar to the UAE. The labor law addresses employer and worker relations. The Ministry of Labor considers training of workers, conditions of employment and safety measures and regulations. The implementation of these regulations is the responsibility of the Ministry of Energy and Industry, but the enforcement of these regulations is negligible, as mentioned in a report published in the USA.

Bahrain has a special department for occupational safety and health administration under the Ministry of Labor and Social Affair. The occupational safety and health department consist of two main units. The first unit is the inspection unit, which has four specialized safety engineers in civil, electrical, mechanical and chemical engineering. The second unit is the vocational guide unit, which contains three subunits,
including the guidance unit, the education unit and the research unit. The department has many goals that aim to protect workers from any possible danger. Some of these goals are: limiting occupational accidents and fatal injuries and financial losses, increasing the protection awareness by assuring the importance of health and safety among workers and employees, and supporting the industrial safety department. Some of the activities performed by this department include:

- Inspecting periodically factories and establishments.
- Supplying safety information and guidelines for occupational safety.
- Supervising the work of inspectors.
- Conducting surveys and field studies to explore the causes of work accidents and establishing databases for occupational safety improvements.
- Investigating accidents, fatal injuries and occupational deaths in different sectors.
- Investigating worker’s complaints and contests related to occupational health and safety.

In summary, we can make the following conclusions about the UAE’s three neighbors:

1. The Kingdom of Saudi Arabia has a special organization for standards and special standards for construction industry.

2. Qatar basically depends on the Labor Law as the UAE does.

3. Bahrain has a well-established occupational safety and health organization.

4. The UAE is not the only country in the region that does not have an occupational safety and health organization.
3.5 The Reality of Occupational Safety in the UAE

In a comprehensive study done by the Ministry of Labor and Social Affairs to study the reality of occupational safety in the country, a sample of 291 organizations was used with construction companies forming 33% of the total sample surveyed. The results of this study are discussed below covering all the organization surveyed.

The first part of the study covered protecting employees from job environment dangers, especially from machinery moving parts. The results showed that 84.7% had safe electrical connections and that only 39.8% had warning signs next to machinery. In the maintenance of machinery 81.6% provided special attention to electrical connections 61.7% had regular inspection of cranes and other machinery, and 78.3% covered hazards with protective covers (see Table 3.1).

<table>
<thead>
<tr>
<th>Job Environment Safety</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe electrical connection</td>
<td>84.7%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Warning signs next to machinery</td>
<td>39.8%</td>
<td>60.2%</td>
</tr>
<tr>
<td>Special attention to electrical connection</td>
<td>81.6%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Regular inspection on cranes and other machinery</td>
<td>61.7%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Covering hazards with protective covers</td>
<td>78.3%</td>
<td>21.7%</td>
</tr>
</tbody>
</table>

Table 3.1: Job environment safety (The Reality of Occupational Safety in the UAE, 2000-2001).
The second part of the study analyzed personal protective equipment. According to the sample, 60.4% of the workers wear suitable work clothes, 75.9% provided a first aid kit, 70.6% provided a sufficient number of fire extinguishers, 62.9% trained workers to use fire-fighting equipment, and only 57.3% provided and maintained personal protective equipment on a regular basis (see Table 3.2).

<table>
<thead>
<tr>
<th>Personal Protective Equipment</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable clothes</td>
<td>60.4%</td>
<td>39.6%</td>
</tr>
<tr>
<td>First aid kit provision</td>
<td>75.9%</td>
<td>24.1%</td>
</tr>
<tr>
<td>Sufficient number of fire extinguisher</td>
<td>70.6%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Trained workers on using fire extinguisher</td>
<td>62.9%</td>
<td>37.1%</td>
</tr>
<tr>
<td>Provide and maintain PPE</td>
<td>57.3%</td>
<td>42.7%</td>
</tr>
</tbody>
</table>

Table 3.2: Personal protective equipment for workers (The Reality of Occupational Safety in the UAE, 2000-2001).

The third part of this study surveyed job environment safety in terms of noise, heat, vibrations, lighting and ventilation. According to the study, 71.2% had an adequate level of machinery noise, 89.2% provided good ventilation, 90.6% provided sufficient lighting, 60.4% provided protection against heat, 33.2% protected workers against vibration, and only 55.3% provided load handling regulations (see Table 3.3).
<table>
<thead>
<tr>
<th>Workers safety in the work place</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control machinery noise</td>
<td>71.20%</td>
<td>28.8%</td>
</tr>
<tr>
<td>Good ventilation</td>
<td>89.2%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Sufficient lighting</td>
<td>90.6%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Protection against heat</td>
<td>60.4%</td>
<td>39.9%</td>
</tr>
<tr>
<td>Protection against vibration</td>
<td>33.2%</td>
<td>66.8%</td>
</tr>
<tr>
<td>Load handling regulations</td>
<td>55.3%</td>
<td>44.7%</td>
</tr>
</tbody>
</table>

Table 3.3: Workers safety in the work place (The Reality of Occupational Safety in the UAE, 2000-2001).

The fourth part examined the maintenance of equipment and chemical equipment. From the total sample surveyed, 52.3% performed regular inspection and kept inspection records, and only 10.9% had regular inspection for pregnant women workers against exposure to harmful chemicals on the industrial establishments.

The fifth part of the study surveyed the different industries disposal polices and their environmental effects. Results of the study showed that 81% of the sample had technical procedures to handle and discard various materials, 86.5% had sufficient containers that met safety requirements, and 78.6% have safety procedures to protect workers during material disposal hazards (see Table 3.4).
Table 3.4: Equipment maintenance and chemicals safety (The Reality of Occupational Safety in the UAE, 2000-2001).

<table>
<thead>
<tr>
<th>Equipment maintenance and chemical safety</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular maintenance and record keeping</td>
<td>52.3%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Inspection for pregnant women</td>
<td>10.9%</td>
<td>89.1%</td>
</tr>
<tr>
<td>Technical Procedures for handling chemical materials</td>
<td>81.0%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Sufficient chemical containers</td>
<td>86.5%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Safety procedures for material disposal</td>
<td>78.6%</td>
<td>21.4%</td>
</tr>
</tbody>
</table>

In another part of the study, the preservation of job site safety was surveyed in terms of site cleaning, ventilation, organized storage, lighting, and stairway railing. According to the result, 81% of the organizations provided the above-mentioned procedures while only 52.7% provided sufficient protection for workers by using personal protective equipment.

The eighth part examined fire alarm systems and the use of material safety data sheets (MSDS). The study showed that 65.5% provided fire alarm systems and only 27.1% provided MSDS.

In an interview with a civil engineer in the Ministry of Public Works and Housing, Al-Ain branch, the source mentioned that the ministry emphasizes safety regulations on their projects.
The source also stated that the civil defense throughout the country ordered the ministry of public works to improve safety and emphasized different requirements as follows:

1. Covering all kinds of accidents and occupational injuries.
2. Covering all properties on the site including the building under construction.
3. Satisfying health and safety requirements for worker housing (in response to a recent workers’ housing fire).
4. Wearing personal protective equipment inside the construction site with no exceptions. The source stated that the minimum allowed PPE are a hardhat and safety shoes.
5. Wearing the personal protective equipment for all consultants and contractor workers and inspecting all workers every two days.
6. Using clear and informative warning signs.
7. Providing for the human needs for workers (drinking water, toilets and others).
8. Cleaning the construction site on a regular basis to avoid potential hazards and accidents.

The ministry awards their projects according to the contractors’ classifications (see Table 3.5).
<table>
<thead>
<tr>
<th>Class</th>
<th>Min. Available Capital $</th>
<th>Min. Staff available</th>
<th>Min. previous projects</th>
<th>Min. Allowed projects Value</th>
</tr>
</thead>
</table>
| Special Class | 5,405,000               | 1. Senior engineer 15 yrs. Experience  
2. An engineer 12 yrs. Experience  
3. Two engineers 10 yrs. Experience  
4. A full estimation team. | 3 projects  
21,600,000 each | > 14,000,000 |
| First Class  | 2,700,000                | 1. Senior engineer 12 yrs. Experience  
2. Two engineers 5 yrs. Experience  
3. A full estimation team. | 2 projects  
10,800,000 each | 5,400,000-14,000,000 |
| Second Class | 1,350,000                | 1. Senior engineer 10 yrs. Experience  
2. An engineer 5 yrs Experience  
3. A full estimation team. | 2 projects  
5,400,000 each | 2,700,000-13,500,000 |
| Third Class  | 800,000                  | 1. Senior engineer 7 yrs. Experience  
2. An estimator | 2 projects  
2,700,000 each | 1,350,000-8,108,000 |
| Fourth Class | 270,000                  | 1. Senior engineer 5 yrs. Experience | 2 projects  
810,000 each | 540,000-4,055,000 |
| Fifth Class  | 135,000                  | 1. An engineer 3 yrs. Experience. | - | <1,350,000 |

Table 3.5: The contractors’ classifications according to the Ministry of Public Works and Housing.
The Ministry rates contractors that previously performed projects for the ministry. This rating or evaluation covers the general performance, safety requirement, and the quality of the work performed. The ministry also established a unit for safety and health last year to inspect and enforce safety of their projects. In case of an accident on the ministry job sites, the ministry (Ministry of Public Works) notifies the Ministry of Labor and Social Affairs as well as the police department.

The chairman of the civil engineering department of the UAE University, an associate professor of structural engineering stated that there are no recent studies in the field of safety in the civil engineering department (Nazmy, 2001). He also mentioned that there are several current funded studies in the field of reinforced concrete in hot arid zones, aviation, and environmental engineering. The school of engineering used to have a safety committee but it did not function for a long period of time. The UAE University does not currently have a faculty member in the field of construction management. All faculties in this field are visiting professors from other universities who stay for a couple of years and leave afterwards. In addition, the teaching load in the UAE University is double the teaching load of other universities, which makes it hard to have time for research. There is no specialized graduate study in the school of engineering, which makes it even more difficult to concentrate on the nations needs in the field of construction safety and health administration.
CHAPTER 4

ANALYSIS OF THE RESULTS

4.1 Introduction to the Section

There are different aspects of safety that need to be evaluated when gathering information about safety performance. Some of these aspects are accidents types, safety training for workers, safety inspections, and personal protective equipment. The questionnaire designed for this study was intended to elicit most of the basic safety aspects in order to establish a basis for future research. The questionnaire employed in this study can be found in Appendix B.

4.2 Definition of the Population

For this particular research, the population consists of construction contractors from the UAE. The sample is the part of the data from which we extrapolate about the whole population. Here the sample is a number of UAE construction contractors. Researchers typically produce data in order to draw conclusions about some wider population.
4.3 Description of Data Collection

The data was collected from three major cities. Abu-Dhabi, which is the capital of the UAE and employs 41% of the total labor force and Dubai, the second largest city in the country, which employs 30% of the total labor force according to the Ministry of Internal Affairs and Al-Ain. The questionnaire was sent to 150 construction contractors received the questionnaire and a total of 121 responded.

There are different aspects of safety that need to be evaluated when gathering information about safety performance. Some of these aspects are accidents types, safety training for workers, safety inspections, personal protective equipment and others. The questionnaire designed for this purpose was intended to cover most of the basic safety aspects in order to provide a basis for future work.

4.4 Questionnaire Design

Based on the questionnaire design, the type of data gathered can be classified into six categories. The first category is company’s information; where information about the construction contractor is obtained through questions about company size, years of experience and type of buildings constructed. The second category is the safety of equipment. This section inquires about the equipment that the company owns in terms of maintenance and maintenance’s staff available. The third category addresses worker safety according to the type of insurance provided, orientation and training programs and personal protective equipment. Site safety, data about the means of fire prevention and
accidents prevention are covered in section four of the questionnaire. The fifth category covers accidents history and background and aims at collecting information about the history of the company regarding accidents and emergency procedures for accidents and injuries. The last category investigates the need for safety program or the existence of a safety program within the company.

4.4.1 Company Information

According to the survey, most of the contractors are relatively large firms in terms of size and years of experience (see Figures 4.1 and 4.2). Of the total contractors surveyed 76% have more than 110 workers and only 9% are relatively small firms. Most contractors have more than ten years of experience, thus they would be classified as second, first and special class contractors according to the classifications used by the Ministry of Public Works and Housing (see Table 3.5).
Figure 4.1: Construction company size in terms of employees.
Figure 4.2: Construction companies' years of experience.

The survey also covered numerous building types. The contractors are involved in the construction of a wide variety of buildings, including residential buildings that range from small houses to palaces. Commercial buildings such as hotels and shopping malls were also included. For example, one of the contractors surveyed is the UAE contractor in the joint venture to construct Burj-Alarb, the tallest hotel in the world. Other types of construction activities covered include highways, bridges and steel construction.
4.4.2 Equipment Safety

In this section of the survey the level of maintenance was evaluated in terms of equipment maintenance (heavy equipment), tool inspection (light tools) and the availability of maintenance staff.

All contractors who have maintenance staff inspect their equipment on regular basis, which forms 94% of the total construction contractors surveyed (see Figures 4.3 and 4.4).

Figure 4.3: Availability of maintenance staff within the surveyed construction contractors.
Figure 4.4: Heavy equipment maintenance.

The contractors seem to prefer inspecting heavy equipment rather than daily used hand tools. While 94% maintain heavy equipment on regular basis 88% inspect the daily tools used on the site (see Figure 4.5).
Figure 4.5: Daily tools inspection done by contractors.

4.4.3 Workers Safety

All construction contractors surveyed provided workers insurance, except for five small contractors, which form 4% of the sample surveyed, who thought that worker insurance is not necessary (Figure 4.6).
Figure 4.6: The provision of workers insurance.

The type of insurance was classified to six types: worker's compensation, life insurance, government care, all risks insurance, accident coverage and health insurance. It is noticeable from Figure 4.7 that life insurance is the most common type of insurance for workers (45%), while government care is the least common type (4%).
Figure 4.7: Type of insurance provided for construction workers.
Another aspect of worker safety is new worker orientation. It was not very common, as shown in Figure 4.8. Only 64% of the contractors surveyed provided orientation for their new workers, the remaining 36% did not provide any orientation.

Figure 4.8: Orientation provision for new construction workers.
For those who provided orientation, the period of the orientation ranged from “on arriving to site” to “two months before starting the actual construction” with two days being the typical length of orientation (see Figure 4.9).

Figure 4.9: Orientation period for new construction workers.
Another serious issue in evaluating worker safety is Personal Protective Equipment (PPE). Around one fourth (1/4) of the surveyed sample do not provide personal protective equipment, which indicates violating the UAE Federal Law No.8 (labor law) and risking the safety of the workers on site (see Figure 4.10).

Figure 4.10: The provision of personal protective equipment
Most of the contractors that provided personal protective equipment emphasize using such equipment and monitor their workers to verify PPE use on daily basis (see Figure 4.11).

![Frequency of Inspection](image)

**Figure 4.11**: The frequency of PPE inspection on site.
Those contractors who do not provide personal protective equipment claimed that such equipment is too expensive; other reasons for not emphasizing PPE are the reduction of productivity and the decision of workers not to use the PPE provided by the contractor (see Figure 4.12).

![Bar Chart: Reasons for not emphasizing PPE](image)

Figure 4.12: Reasons for not emphasizing PPE use.

Another very important issue here, which was mentioned by a number of contractors, is that some workers, especially Sikh, refuse to wear hard hats because of their religious
values. In fact, some contractors believe that a Sikh’s turban functions as a hard hat (see Figure 4.13). Table 4.1 summarizes the data on equipment safety, personal protective equipment and workers safety.

Figure 4.13: A Sikh construction worker wearing his turban on the construction site.
<table>
<thead>
<tr>
<th>Equipment and Workers Safety</th>
<th>Available</th>
<th>Not available</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment maintenance</td>
<td>114</td>
<td>7</td>
<td>94.2%</td>
</tr>
<tr>
<td>Maintenance Staff</td>
<td>107</td>
<td>14</td>
<td>88.4%</td>
</tr>
<tr>
<td>Tools Inspections</td>
<td>107</td>
<td>14</td>
<td>88.4%</td>
</tr>
<tr>
<td>Workers Insurance</td>
<td>114</td>
<td>7</td>
<td>94.2%</td>
</tr>
<tr>
<td>New workers orientation</td>
<td>78</td>
<td>43</td>
<td>64.5%</td>
</tr>
<tr>
<td>Personal Protective Equipment use</td>
<td>91</td>
<td>30</td>
<td>75.2%</td>
</tr>
</tbody>
</table>

Table 4.1: Survey results for the equipment and workers safety.

4.4.4 Safety On Site

In this section, the level of safety on site is evaluated. Most of the contractors surveyed use signs for site safety, as required by the UAE Federal Law No.8 (labor law) (see Figure 4.14). Fences are a second major means of protection used on site (see Figure 4.15).
Figure 4.14: A sign indicating “Safety First” as could be seen on a construction site in Dubai (picture taken and enhanced by the author).

Figure 4.15: The means of protection on construction sites as specified by construction contractors.
A considerable number of contractors indicated that they do not provide any means of protection on site. Concerning fire extinguishers, which are a requirement by the UAE Federal Law No.8 (labor law), 25 contractors from the sample studied do not provide any on site (see Figure 4.16).

Figure 4.16: The provision of fire extinguishers on site.
All sample contractors provide toilets, drinking water, eating areas on site and clean the site on a regular basis. Twenty six percent (26%) of the sample contractors violate the UAE Federal Law No.8 (labor law) by not providing a first aid kit on site (see Figure 4.17).

Figure 4.17: The provision of first aid kits on site.
For drug prevention program, 58% of the sample contractors provided drug prevention programs. What should be mentioned here is that drugs are illegal in the UAE. The consumption of drugs or other alcoholic beverages will subject the consumer to legal interrogation (see Figure 4.18). Thus some contractors could depend on the government in creating a drug free work place.

Figure 4.18: The availability of drug prevention programs.
Only 66% of the sample contractors surveyed employed safety personnel on site (see Figure 4.19). According to the UAE Federal Law No.8 (labor law), each establishment should provide a competent person for safety monitoring on the work place. Only 20.6% provided such a person according to a study done by the Ministry of Labor and Social Affairs and only 33.7% had workers trained in using first aid kits in different establishments. See Table 4.2 for survey results on construction site safety.

![Safety Personnel on Site](image)

Figure 4.19: The employment of safety personnel on Site.
<table>
<thead>
<tr>
<th>Site Safety</th>
<th>Available</th>
<th>Not available</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Extinguisher</td>
<td>95</td>
<td>26</td>
<td>78.5%</td>
</tr>
<tr>
<td>Lunch Area</td>
<td>87</td>
<td>34</td>
<td>71.9%</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>121</td>
<td>0</td>
<td>100.0%</td>
</tr>
<tr>
<td>Toilets</td>
<td>114</td>
<td>7</td>
<td>94.2%</td>
</tr>
<tr>
<td>Site Cleaning</td>
<td>121</td>
<td>0</td>
<td>100.0%</td>
</tr>
<tr>
<td>Drug Prevention</td>
<td>70</td>
<td>51</td>
<td>57.9%</td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>90</td>
<td>31</td>
<td>74.4%</td>
</tr>
<tr>
<td>Safety Personnel</td>
<td>80</td>
<td>41</td>
<td>66.1%</td>
</tr>
</tbody>
</table>

Table 4.2: The survey results on construction site safety.

4.4.5 Accidents and Injuries History and Procedure

Around 76 contractors of the surveyed sample had a fatal accident, which is equivalent to 63%. This percentage is relatively large, if we consider the frequency or the number of fatal accidents for each contractor (see Figures 4.20 and 4.21).
Figure 4.20: The surveyed contractors’ history of fatal accidents.
Figure 4.21: The frequency of fatal accidents.

All of the above mentioned accidents involved workers only, persons from the general public were not involved. The type of accidents that frequently occur on site are ranked by contractors surveyed as follows:

1. Fall from elevation.
2. Struck by equipment.
3. Natural causes (e.g. illness).
4. Struck by falling material.

See Figure 4.22 for the different accidents ranked by contractors.
Figure 4.22: Types of accidents ranked by contractor according to their frequency of occurrence.

4.4.6 Safety Programs

Most of the sample contractors, 84%, keep records of the accidents and injuries involving their workers, those who do not are violating the UAE Federal Law No.8 (labor law) (see Figure 4.23). According to the survey, 59.5% notify the police department in case of an accident and only 73.6% notify the Ministry of Labor and Social Affairs (see Table 4.3).
Figure 4.23: Record keeping of previous accidents and Injuries.

<table>
<thead>
<tr>
<th>Accident Procedures</th>
<th>Not available</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calling Police</td>
<td>89</td>
<td>73.6%</td>
</tr>
<tr>
<td>Calling Ministry of Labor</td>
<td>72</td>
<td>59.5%</td>
</tr>
<tr>
<td>Nothing</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Others</td>
<td>73</td>
<td>60.3%</td>
</tr>
</tbody>
</table>

Table 4.3: The surveyed contactors reaction in case of an accident on site.
According to the UAE Federal Law No.8 (labor law), not only should the Ministry of Labor and Social Affairs be notified in case of any work accident, but also the police department and civil defense. When the ministry inspector arrives at site he or she should perform the following:

1. Inspect accident site and identify accident causes.
2. Write a report about the accident specifying the causes and any violation of the Federal Law No.8 (labor law).
3. Follow up with an injured worker until his injury is stable.

Most of the sample contractors agreed that accidents do not affect a company’s reputation, worker productivity, project duration, or work cost (see Figures 4.24- 4.27).

![Company Reputation Chart]

Figure 4.24: The existence of negative influence on company reputation due to accidents.
Figure 4.25: The influence on workers productivity due to accidents.

Figure 4.26: The occurrence of project delays due to accidents.
Most of the contractors agreed that there is no government agency that inspects construction site safety. That means there is insufficient awareness among construction contractors concerning the inspection unit in the Ministry of the Labor and Social Affairs and subsequently, the role of this unit in the ministry may be questioned.
4.5 Conclusions

Based on the above analysis of the data collected several conclusions were reached as follow:

1. Some of the surveyed contractors (25 – 30%) of the total do not believe that safety is a priority.

2. This group as well as the absence of an organized safety organization gives rise to poor safety practices and accidents.

3. Small contractors tend to sacrifice worker safety for greater profit.

4. Small contractors tend to violate several requirements by the UAE Federal Law No.8 (labor law) examples are first aid kits, fire extinguishers, using PPE, and reporting accidents.

5. There is no specialized inspection organization for construction site safety.
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Research

The construction industry has been rapidly developing in the United Arab Emirates. Despite the fact that this country is among the most developed countries in the region, the current situation of safety in this industry is unclear.

The objective of this study is to create a basis for establishing and enforcing comprehensive safety codes and practices in the UAE. A survey was conducted to evaluate construction contractors' performance and a comprehensive study of the UAE Federal Law No.8 (labor law), which governs and controls the different occupations, was carried out. In addition, several interviews were held with influential authorities.

As an assessment tool, this study may have the potential to improve the construction safety performance in the United Arab Emirates.
5.2 Conclusions and Recommendations

Based on the survey conducted and data analysis examined in the previous chapters, several findings could be established. First, the construction industry is not the only occupation in the United Arab Emirates (UAE) that needs safety regulations and administration. Second, some of the surveyed contractors not only did not provide any personal protective equipment (PPE) but also did not provide any means of protection on site. In addition, several contractors of the surveyed construction contractors violated the UAE Federal Law No. 8 and did not report accidents or keep records of them. Moreover, there is insufficient awareness among construction contractors of the role of the Inspection Department in the Ministry of Labor and Social Affairs, which suggests that this department is not performing an adequately.

According to the analysis of the UAE labor regulations (see Chapter 3), we found that the UAE Federal Law No.8 is the only law that regulates most of the occupations in the country, and it does not address the different occupations and their needs, but rather establishes rules that could be applied for most occupations. In addition, sections 5,8 and 10 of the UAE Federal Law No.8 are the only sections that regulate and address safety. The remaining sections regulate employment relations, contracts, and procedures. The law also does not provide specifications for personal protective equipment (PPE), their types, and the activities requiring PPE. The personal protective equipment is subjectively determined by the employer according to what is considered necessary. Moreover, there is a lack of regulations regarding concrete and masonry construction, steel erection, tunnels, caissons, cofferdams, the use of explosives, and power transmission and distribution. The UAE Federal Law No.8 has been updated several times, but it has not
kept pace with the development of the construction industry. Different new equipment has been used throughout the industry, which require safety guidelines to accompany them. Furthermore, the duty or role of enforcing safety is divided between the Civil Defense Department and the Ministry of Labor and Social Affairs, which makes it hard to implement safety procedures and monitor them. Thus, the UAE construction industry lacks the existence of an authority that creates and emphasizes occupational safety and health.

The conclusions of this study fall into two categories: first to maintain the UAE Federal Law No. 8 as the prime regulator of occupational safety and health, and second to create another authority under the Ministry of Labor and Social Affairs a true organization that will undertake this duty.

In the case of maintaining the UAE Federal Law No. 8 as the main authority of occupational safety and health, several modifications should be considered as follows:

1. Enforcing the use of personal protective equipment and requiring construction contractors as well as other employers to insure the safety of their workers by providing personal protective equipment and a safe work place.

2. Specifying the personal protective equipment that should be used in the different activities on the site in terms of:
   - Determining the types of personal protective equipment that should be used and the standards that should be met by this personal protective equipment.
   - Determining the types of activities and personal protective equipment that should be used accordingly.

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• Making regular inspections of construction sites to inspect the use of personal protective equipment and fine firms for any violations.

• Designing and implementing a program for fire fighting equipment inspections.

• Requiring contractors to provide and maintain a safe and healthy job site in terms of:
  
  a. Noise levels and vibrations.
  
  b. Adequate ventilation and toilets for workers on site.
  
  c. Adequate lighting level and frequent site cleaning.
  
  d. Heat level and adequate shelter when working under the sun.
  
  e. Potable water and shelters for lunch.

Another section of the law should require contractors to provide means of protection against accidents as follows:

  a. Fall protection devices.
  
  b. Railways on staircases and floor edges.
  
  c. Warning signs.
  
  d. Barriers and covers over and around hazards on site.

3. Updating the safety regulation and standards as required and establish safety guidelines for all new equipment and technology used.

4. Publishing handbooks and manuals for safety procedures and practices on site.

5. Establishing a more comprehensive system for accident reporting.

6. Creating a database for accidents types and frequency of occurrence.

8. Creating a system for contractor ratings based on the federal labor violation, the accident type, and their frequency of occurrence.

9. Establishing a procedure for employee selection and license issuing to be based on a worker's qualifications rather than the amount of salary to be paid and also providing comprehensive training for workers in different fields of activities on the site.

10. Creating and establishing more inspection units in the country with fully qualified teams and investigation expertise.

11. Creating a media campaign that will raise the issues of construction safety and create more awareness among the general population about the importance of safety.

Concerning the second recommendation, which is creating another authority for occupational safety and health under the Ministry of Labor and Social Affairs, the following should be considered:

- establishing an organization under the Ministry of Labor and Social Affairs that has the power of the UAE Federal Law No. 8 in enforcing safety.

- The primary goal of this authority or organization is to emphasize safety and health practices in the workplace.

- This organization should:
  
  a. Cover all types of occupations in the country and at the same time separate their rules.
  
  b. Employ specialized people in health and safety procedures and train them regularly.
c. Establish safety regulations that would be applied and followed in every occupation.
d. Provide guidance for personal protective equipment that should be used, the activities that should use them and the standards that these PPE should follow.
e. Create standards in terms of quantities, measures and distances, for safety requirement.
f. Fine standards and rules violators severely to stop unsafe practices.
g. Enforce orientation, training and safety procedures and workshops among construction contractors.
h. Establish a rating for contractors according to their safety performance.

5.3 Future Work

While the objective for the evaluation of the safety performance in construction site operation in the UAE has been achieved, other enhancements would make this study more influential. Future study might include the following:

1. An institutional design of a safety institution that will support safety in the current labor law. This design would suggest the institution’s units, functions, safety standards, and regulations.

2. A database for construction accidents could be added. To build this database a form for accident reporting should be designed including all the entries required for the database, and comprehensive data on previous construction accidents that
could be added to the database. This database is very important to assess the magnitude of construction site accident and determine the rescue process required.

3. An expert system could be used to address construction contractors' needs in terms of site safety. To build the expert system, a comprehensive knowledge base from construction safety experts would be required. This system would suggest the personal protective equipment (PPE), means of site safety control, potential hazards on site, and provide the corresponding laws for theses suggestions.

4. Finally, a rating system for construction contractors could be established. This rating system should incorporate accidents history, safety programs, and safety violations.
APPENDIX A

THE UAE FEDERAL LAW NO.8

Federal Law No. 8 of 1980 regulating labor relations as amended by Federal Laws Nos. 24 of 1981, 15 of 1985 and 12 of 1986 (the "Law").

EMPLOYEE RECORDS

An employer who has 5 employees or more in his service, shall adhere to the following:

1. Keeping a file for every employee giving his name, trade or profession, age, nationality, place of residence, marital status, date of commencement of service, wage and any change in it, vacation, illness and injuries, and the date of termination of service and the reason for termination.

2. A "leave card" for every employee to be kept in his file. It should be divided into three sections:
The first for annual leave, the second for sick leave and the third for other leaves. The employee or any person acting on his behalf shall note on his card all leaves taken by the employee for future reference. In addition to this, an employer who employs 15 employees or more shall keep in every place of work or a branch of the place of work the following records and Documents:

1. A record of payroll listing the employee's names according to the date of their recruitment along with the daily, weekly or monthly wages, allowances or payments for piecework, commission as well as length of service and date of leaving the job.

2. A record for work injuries listing work injuries or occupational diseases immediately the employer is informed.

3. The basic rules and regulations for work should be displayed in a permanent, visible place, at the site of work showing the basic regulations for work including Working hours, weekly holidays, official holidays, and the necessary safety precautions to avoid work hazards and fire dangers. The implementation of these regulations and any amendments thereto have to be sanctioned by the labor dept. within 30 days from the date of their submissions.

4. The company regulations relating to disciplinary measures must be permanently displayed in the place of work. This must outline measures, which may be taken against those who violate these regulations.

The implementation of these regulations and the amendments thereof, will have to be sanctioned by the labor department within 30 days from the date of submission.
SAFETY REQUIREMENTS

The UAE Federal Labor Law specifies certain provisions for employee safety and health care stipulated under Article 91 to Article 101. The provisions of the law require the following measures and procedures to be adhered to:

1. Every employer should provide his employees with suitable means of protection against injuries, occupational diseases that may be contracted during work, fire and hazards, which may result from the use of machinery and other work equipment. The employer shall apply all the other precautionary measures specified by the Ministry of Labor and Social Affairs. The employee however, has to use the safety equipment and clothes given to him for this purpose. He shall also follow his employer's instructions, which aim to protect him from danger.

2. Every employer shall display in a permanent and prominent place at the work site, detailed instructions regarding the means of preventing fire and the means of protection of employees from hazards to which they may be exposed during work. These instructions shall be in Arabic and if necessary another language understood by the employee.

3. Every employer shall make available a first aid kit or kits containing medicines, bandages and other first aid material as directed by the Ministry of Labor and Social Affairs.

4. Every employer shall keep every place of work clean and well ventilated. These places should have adequate lighting and be provided with water suitable for drinking, and bathrooms.
5. An employee shall assign one or more physicians to examine thoroughly those of his employees who are exposed to the possibility of contracting one of the occupational diseases listed in the schedule attached to this law. At least once every six months, these, "at risk" employees should be examined and results recorded on their files.

6. An employer shall provide his employee with the means of medical care up to the standard determined by the Ministry of Labor and Social Affairs in consultation with the Ministry of Health.

7. The employer or his deputy shall inform the employee of the dangers of his job and the means of protection that he has to take. He shall also display detailed written instructions concerning that at work premises.

8. No employer, his deputy, or any person who has authority over employees shall bring or allow others to bring any kind of alcoholic drinks for consumption on work premises. He shall also not allow any person to enter the establishment or to remain in it, while he is intoxicated.

   Every employer employing employees in remote areas not served by public means of transportation, shall provide his employees with the following services:

   a. Suitable transportation.

   b. Suitable accommodation

   c. Suitable drinking water

   d. Suitable food

   e. First aid services

   f. Means for entertainment and sports activities

All the above services apart from food material will be on the employer's account.
DISCIPLINARY CODE

1. Disciplinary Code

The disciplinary code in the UAE Federal Labor law provides for the provision of disciplinary measures, which any employer or his representative may impose upon his employees. They are as follows:

- Warnings
- Fines
- Suspension from work with a decrease in wages for not more than 10 days.
- The prevention of periodical allowances or the postponement of in establishments where such allowances exists.
- The deprivation of promotion in establishments where promotions exists.
- Termination of service without prejudice to the payment of all ends of service benefits.
- Termination of service and the forfeiture of all or some of his gratuity. This punishment shall not be imposed for any reason other than those mentioned in Article 120 of this law.

1. The maximum fine an employer can impose on his employee

A fine may be a fixed sum of money or an amount equivalent to the employee's wage for a certain period. A fine for one violation shall not exceed 5 day's wages, and indeed in any month total fines shall not exceed an amount equivalent to 5 day's wages.
A fine imposed on an employee shall be entered in a special register giving the reason or the circumstances, name of employee and his wage. A special account shall be kept for these fines, the monthly total of which shall be spent on social welfare for the employees.

4. The time and frequency an employer can deprives an employee from the periodical allowances or promotion.

Any punishment depriving an employee of his periodical incentives may not be imposed more than once within one year. His incentives shall not be postponed for more than six months. Further, no employee shall be deprived of more than one promotion. The punished employee shall be promoted in the first succeeding opportunity if he satisfies the necessary conditions.

5. The limitations and the conditions required by the law pertaining to the use of disciplinary codes.

The employer may not impose any disciplinary measures on the employee unless the following conditions are met:

1. No disciplinary action shall be taken against any employee because of something he committed outside the place of work unless it is related to work, the employer or the manager in charge of the work.
2. No more than one punishment shall be imposed for one violation. A disciplinary punishment shall not be accompanied with deduction of part of the employee's wages.

3. None of the punishment provided for referred to here above shall be imposed on a employee unless he is informed of his violation in writing and given a chance to defend himself. His statement and defense shall be noted and written in his file, and the punishment imposed shall be spelled out at the end of the said note.

4. An employee must be informed in writing of the punishment that is imposed on him, stating its type and amount, the reason thereof and the punishment he shall be subject to in case of recurrence.

5. No employee shall be accused of an offense after the lapse of 30 days of its discovery. No disciplinary action shall be imposed after the lapse of 60 days from the end of investigation regarding the violation, and the confirmation of its recurrence.

6. Conditions of suspension of an employee from employment.

An employee may be temporarily suspended from work when he is accused of committing a deliberate crime such as physical assault, or financial crime, crimes of honor, or going on strike. The suspension shall take effect from the date of informing the concerned authority of the incident until a decision is taken by the authority regarding that incident. An employee shall not be entitled to his wages during the suspension period. If the verdict relieves the employee from standing trial or acquits him, he shall be
reinstated in his work and given his full wage for the suspension period if his suspension was a malicious act by the employer.

**WORK ACCIDENT**

1. The nature of reporting labor accidents and occupational diseases

If the employee suffered a work accident or an occasional disease, the employer or his representative shall report the accident immediately to the police and labor department or one of its branches under whose jurisdiction the place of work falls. The information shall include the employee’s name, profession, address, nationality and a brief description of the incident and its circumstances, and the measures taken for treatment or first aid.

2. The employer prosecuted for an accident or an injury by an employee

Upon receiving the information from the employer, the police shall perform the necessary investigation stating in their report testimony from witnesses, the employer or his representative, and the injured person if his condition allows him to testify. The report shall specifically state whether the accident related to work, whether it took place intentionally, or as a result of misbehavior on the part of the employee.
If the report came to the conclusion that one of the employer's personnel or managers were at fault or negligent, he may be prosecuted in a criminal court for the act or omission.

3. The compensation

In case of work accident and occupational diseases, the employer shall under take to pay the cost of the employees' treatment in one of the government or private clinics till the employee recover or his disability becomes certain. The treatment shall include hospital and sanitary fees and cost of surgical operations, X-rays and laboratories fees in addition to the cost of medicine and rehabilitation equipment and artificial parts for those whose disability is proven. The employer shall also pay the travel expenses needed for the employees' treatment.

4. The employee was not able to perform his work after the accident.

If the injury prevented the employee from performing the duties of his job, the employer shall pay him a grant equivalent to his wage during the treatment period or for six months whichever is less. If the treatment takes more than six months, then the grant shall be reduced by half for another six months or till the employee recovers, his disability becomes certain, or he dies, whichever comes first.
5. Payroll during treatment

The financial grant made by the employer shall be calculated on the basis of the last wage the employee was paid in respect of those who are paid monthly, weekly, daily or hourly and on the basis of the average wage for those who are paid on piece work basis.

6. Compensation other than his wages

The employee will not be entitled to claim compensation from the employer other than his wages and compensation for disability according to the schedule published by the labor office. A copy of this schedule is attached herewith to this catalogue. This is, of course, without prejudice to the employee's right to claim compensation against any third party that may participate in causing the accident or the disability suffered by the employee.

7. The employee's family compensation

The employee's family is not entitled to claim compensation unless the accident caused the death of the employee or his permanent disability. The compensation shall be equivalent to the basic wage of the employee for a period of 24 months. The value of the compensation shall not be less than Dhs. 18,000/- and not more than Dhs. 35,000/-. It
shall be calculated on the basis of the last wage the employee was paid before his death and divided among inheritors according to the rules of the list-annexed law.

8. The heirs of the employee, entitled to receive compensation

In applying the rules of the Labor Law, the family of the deceased means those who depend for their livelihood entirely, or mainly, on the income of the deceased person at the time of his death. They must qualify by being included among the following categories:
- Widow.
- Children who are: sons under 17, and those under 24 who are enrolled as a regular student in the institution of learning, and also those of his sons who are physically or mentally unable to earn their living. The word "Son" shall include sons of the husband or the wife who are under the care of the deceased employee at the time of his death.
- Unmarried girls including unmarried daughters of the husband or the wife who are under the care of the deceased employee at the time of the death.
- Parents
- Brothers and sisters according to the conditions set for sons and daughters

9. Self-injury

If it was evidenced in a report provided by the labor office or the police that the employee had intentionally caused his own injury in order to receive compensation or
medical leave then he would not be entitled to either compensation or medical leave, and
would be liable for criminal charges to be brought upon him.

DISPUTE SETTLEMENT

1. A dispute between the employee and the employer

In case of a dispute between the employee and the employer, or either, an
application must be made, should either of the party fail to settle the dispute, to the labor
office in the emirate in which the employer's establishment is located. The application
must be made by written complaint with the complaint department at the labor office,
setting out a summary of the facts, calculation of the amount due, and enclosing a copy of
the labor contract. The application will be filed with the Ministry upon collection of Dhs.
100 as registration fees. Either the employer or the employee will be summoned to hear
the argument at the labor office, and at the Ministry of Labor and Social affairs must
make the recommendation within two weeks from the date on which the application is
filed. Should the party still fail to settle the dispute as recommended by the Labor Office,
the matter will then have to be referred to court to be litigated in the normal matter. In
such a case, the Labor Office will issue summary of the case, the facts of the case, and
the memorandum together with the recommendation, and the argument put by either
party. The court, within 3 days from the date on which application is received, shall
schedule a hearing date and summon the other party to hear the matter.
2. The application to the labor office and the court

A complaint by either the employer or the employee must be made to the labor office within one year from the date on which the amount or the entitlement becomes due. In other words, the one-year time period is not from the date the employment is terminated, but from any date an amount become due and not paid. A complaint therefore must be filed within a year from the date on which such an amount becomes due, otherwise, it will be time barred. In calculating time and period according to this law, the Gregorian calendar will be used. The year is calculated as 365 days and the month 30 days.

3. Court fees

Employees are exempted from court fees and his action will be filed in court and if an appeal is filed, to the appeal court, without having to pay any court fees. However, an employer, if he would like to proceed with the court action, should the matter fail to settle at the labor office, must pay court fees, which are normally based at a percentage of the amount claimed.
4. The complaint filed by a group of employees against one employer

The law provides slightly different provision for hearing claims by the Labor Office for a number of employees of the same establishment, filing a complaint against their employer. It may take longer to be settled at the Labor Office and the Labor Office may form a committee to settle such a dispute.

LABOUR INSPECTIONS

1. Inspection of the establishment or commercial entities established in the UAE

The Labor Inspection Dept. and the personnel employed therein shall undertake labor inspections and shall have the power provided in this law. The inspector shall carry the identification card issued by the Ministry of Labor and Social Affairs, and shall be entitled to enter premises for inspection. Employers and their agents shall present the labor inspectors with all necessary facilities and information to perform their duties and shall consent to any summons to appear before them, or send a delegate to appear on their behalf, if they are required to do so.

2. The jurisdiction and the authority of the labor inspectors

A Labor Inspector has responsibility for the following:
1. Supervising the proper enforcement of the provision of the labor law especially terms of work, wages and protection of the employees while performing their jobs and whatever relates to their health and safety, and also in the employment of juveniles and woman.

2. Providing employers and employees with the information and technical guidance that will enable them to adopt the best means for the enforcement of the provision of the law.

3. Informing the concerned authority of any loopholes, which the provision enforcement fails to remedy and recommending any necessary steps.

4. Recording incidents where the provisions of the labor law and the regulations have been violated.

A Labor Inspector has the right to:

1. Enter any establishment that is subject to the provision of the labor law at any time during the day or night without prior notice provided that such entry is made during working hours

2. Conduct any test or investigation that may be necessary to ascertain the proper enforcement of the law.

3. The labor inspectors further may question the employee or the employer, examine all records which have to be kept under the provision of the labor law, take a sample or samples of material used, or handled, in the industrial activities, and ascertain that notices and pamphlets required to be displayed at the site of the work are in accordance with the provision of the law.
# OCCUPATIONAL DISEASES

<table>
<thead>
<tr>
<th>NO.</th>
<th>TYPE OF DISEASE</th>
<th>WORK CAUSING DISEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poisoning by lead and its compounds</td>
<td>Any work involving the use or handling of lead and compounds which contain leads</td>
</tr>
<tr>
<td>2</td>
<td>Poisoning by mercury and its compounds.</td>
<td>Any work involving the use or handling of mercury or its compounds or materials containing mercury and any work involving exposure to the dust or gases of mercury or of its compounds or materials containing mercury.</td>
</tr>
<tr>
<td>3</td>
<td>Poisoning by arsenic and its compounds</td>
<td>Any work involving the use of handling of arsenic or its compounds or materials containing arsenic and any work involving exposure to the dust and gases of arsenic or of its compounds or materials containing arsenic.</td>
</tr>
<tr>
<td>4</td>
<td>Poisoning by antimony and its compounds</td>
<td>Any work involving the use or handling of antimony, its compounds or materials containing antimony and any work involving exposure to the dust and gases of antimony or of its compounds.</td>
</tr>
<tr>
<td>5</td>
<td>Poisoning by phosphorous and its compounds</td>
<td>Any work involving the use of handling of phosphorus, its compounds or materials containing phosphorous and any work involving exposure to the dust of gases of phosphorus or of its compounds or materials containing phosphorus.</td>
</tr>
<tr>
<td>6</td>
<td>Poisoning by petroleum, its derivatives, compounds and by-products</td>
<td>Any work involving the handling or use of petroleum, its derivatives and compounds and any work involving exposure to their dust or gases</td>
</tr>
<tr>
<td>7</td>
<td>Poisoning by manganese and its compounds</td>
<td>Any work involving the use or handling of manganese, its compounds or materials containing manganese, and any work involving exposure to the gases or dust of manganese or of its compounds and any products containing manganese.</td>
</tr>
<tr>
<td>8</td>
<td>Poisoning by sulfur and its compounds</td>
<td>Any work involving the use or handling of sulfur, its compounds or materials containing sulfur, and any work involving exposures to gases or dust of sulfur or its compounds alloys.</td>
</tr>
</tbody>
</table>

Table A.1: Types of occupational diseases (Federal Law No.8) (Continued).
<table>
<thead>
<tr>
<th></th>
<th>Table A.1: Continued.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Poisoning by petroleum, its by-products and Compounds.</td>
</tr>
<tr>
<td>10</td>
<td>Poisoning by chloroform or carbon tetrachloride</td>
</tr>
<tr>
<td>11</td>
<td>Diseases resulting from radium, radio-active Substances (X-ray)</td>
</tr>
<tr>
<td>12</td>
<td>Chronic diseases of the skin and burns of the skin and the eyes.</td>
</tr>
<tr>
<td>13</td>
<td>Injuries of the eyes by heat and light and their Complications.</td>
</tr>
<tr>
<td>14</td>
<td>Lung diseases resulting from silica dust, asbestos and cotton dust.</td>
</tr>
<tr>
<td>15</td>
<td>Anthrax</td>
</tr>
<tr>
<td>16</td>
<td>Glanders</td>
</tr>
<tr>
<td>17</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>18</td>
<td>Enteric fever</td>
</tr>
</tbody>
</table>
## PERMANENT DISABILITY RATING

<table>
<thead>
<tr>
<th>DEGREE OF DISABILITY</th>
<th>NATURE OF PERMANENT DISABILITY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERMANENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Loss of both arms from the shoulders and loss of any two or more limbs</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Complete loss of sight in both eyes or loss of two eyes</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Complete paralysis</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Dementia or complete mental derangement</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Wounds and injuries to the head or brain which cause continuous headache</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Complete deformation of the face</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>Injuries and wounds to the chest and internal organs which cause a continuous and complete deficiency in the function of These organs.</td>
<td>100</td>
</tr>
<tr>
<td>PARTIAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Loss of both legs from the top</td>
<td>90</td>
</tr>
<tr>
<td>9</td>
<td>Loss of hands from the elbow or above</td>
<td>85</td>
</tr>
<tr>
<td>10</td>
<td>Severe deformation of the face</td>
<td>80</td>
</tr>
<tr>
<td>11</td>
<td>Loss of both hands from the elbow</td>
<td>70</td>
</tr>
<tr>
<td>12</td>
<td>Complete loss of the right arm from the joint of shoulder or from the elbow</td>
<td>70</td>
</tr>
<tr>
<td>13</td>
<td>Loss of both legs from the knees or above</td>
<td>70</td>
</tr>
<tr>
<td>14</td>
<td>Complete loss of the left arm from the joint of shoulder or from the elbow</td>
<td>60</td>
</tr>
<tr>
<td>15</td>
<td>Loss of one leg from the knee or above</td>
<td>60</td>
</tr>
<tr>
<td>16</td>
<td>Loss of the right arm from the elbow or below</td>
<td>60</td>
</tr>
<tr>
<td>17</td>
<td>Loss of one leg from above</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>Loss of both legs from below the knee</td>
<td>60</td>
</tr>
<tr>
<td>19</td>
<td>Loss of all the fingers of the right hand including the thumb</td>
<td>60</td>
</tr>
<tr>
<td>20</td>
<td>Loss of the left arm from above or below the elbow</td>
<td>50</td>
</tr>
<tr>
<td>21</td>
<td>Loss of the fingers of the left hand including the thumb</td>
<td>50</td>
</tr>
<tr>
<td>22</td>
<td>Loss of one leg below the knee</td>
<td>50</td>
</tr>
<tr>
<td>23</td>
<td>Complete and permanent deafness</td>
<td>50</td>
</tr>
</tbody>
</table>

Table A.2: Permanent disability rating (Federal Law No.8) (Continued)
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>Complete loss of the tongue or permanent numbness</td>
<td>45</td>
</tr>
<tr>
<td>25</td>
<td>Loss of both feet from the heel or below the heel</td>
<td>45</td>
</tr>
<tr>
<td>26</td>
<td>Loss of the sexual organ</td>
<td>45</td>
</tr>
<tr>
<td>27</td>
<td>Loss of sight in one eye</td>
<td>45</td>
</tr>
<tr>
<td>28</td>
<td>Loss of the right hand from the wrist</td>
<td>38</td>
</tr>
<tr>
<td>29</td>
<td>Loss of the thumb or four fingers of the right hand</td>
<td>35</td>
</tr>
<tr>
<td>30</td>
<td>Loss of the left hand from the wrist</td>
<td>34</td>
</tr>
<tr>
<td>31</td>
<td>Loss of the thumb or four fingers from the left hand</td>
<td>25</td>
</tr>
<tr>
<td>32</td>
<td>Loss of the one foot from the heel or below the heel</td>
<td>20</td>
</tr>
<tr>
<td>33</td>
<td>Loss of all toes in one foot including the big toe</td>
<td>20</td>
</tr>
<tr>
<td>34</td>
<td>Loss of three fingers of the right hand excluding the thumb</td>
<td>20</td>
</tr>
<tr>
<td>35</td>
<td>Loss of the right index finger</td>
<td>15</td>
</tr>
<tr>
<td>36</td>
<td>Loss of the distal phalanx of the right thumb</td>
<td>10</td>
</tr>
<tr>
<td>37</td>
<td>Loss of the left index finger</td>
<td>10</td>
</tr>
<tr>
<td>38</td>
<td>Loss of three fingers excluding the thumb</td>
<td>10</td>
</tr>
<tr>
<td>39</td>
<td>Loss of all toes in a foot excluding the big toe</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>Loss of the big toe</td>
<td>10</td>
</tr>
<tr>
<td>41</td>
<td>Loss of the distal phalanx of the left big toe</td>
<td>6</td>
</tr>
<tr>
<td>42</td>
<td>Loss of the middle finger in the right hand</td>
<td>6</td>
</tr>
<tr>
<td>43</td>
<td>Loss of the middle finger in the left hand</td>
<td>6</td>
</tr>
<tr>
<td>44</td>
<td>Loss of the ring finger in the right hand</td>
<td>6</td>
</tr>
<tr>
<td>45</td>
<td>Loss of the ring finger in the left hand</td>
<td>6</td>
</tr>
<tr>
<td>46</td>
<td>Loss of the little finger in the right hand</td>
<td>6</td>
</tr>
<tr>
<td>47</td>
<td>Loss of any finger in the left hand</td>
<td>6</td>
</tr>
<tr>
<td>48</td>
<td>Loss of the distal phalanx of any finger excluding the thumb</td>
<td>5</td>
</tr>
<tr>
<td>49</td>
<td>Loss of the second phalanx of the index finger in the right hand</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>Loss of toes of the foot excluding the big one</td>
<td>5</td>
</tr>
<tr>
<td>51</td>
<td>Loss of one molar tooth</td>
<td>3</td>
</tr>
<tr>
<td>52</td>
<td>Loss of a canine tooth</td>
<td>2</td>
</tr>
</tbody>
</table>
1. A permanent total disability in the functions of any organ or part of the body shall be considered as a complete loss to that part or organ.

2. If the injured person was left handed, all compensation for injuries of the left hand shall be considered as if they were for the right hand.

3. In the case of deformation or unnatural change to any organ or part of the body or any of the senses not mentioned in the list, the rate of disability shall be estimated by the Medical Board provided in Article (148) of this law, which shall take into consideration similar cases in the list.

TERM OF DISTRIBUTION OF DEATH COMPENSATION AMONG MEMBERS OF THE DECEASED EMPLOYEE'S FAMILY

If the widow (or widower), lives with the parents and offspring who were supported by the deceased, the compensation shall be divided as follows:

1. The widow (or widower) shall take one eighth and if there are more than one widow (or widower), the one eighth shall be divided equally among them, the parents shall take one third divided equally between them, but if either of the parents is dead then the mother shall take one sixth, and the father shall take one third and the rest for the offspring. If there are no children, the widow (or widower) shall take two thirds of the compensation (to be divided equally among them if there are more than one) and the father shall take the remainder. In cases where both parents are living they shall share that
remainder equally. If both parents are dead, the widow (or widower) shall have one
eighth of the compensation (to be divided equally among them if there are more than one
widow) and the offspring shall get whatever remains. In cases where there are no children
and no living parent, the widow (or widower) shall take the whole compensation. If there
is more than one widow, the compensation shall be divided equally among them.
2. If there exists one or both of the parents and a child who were supported by a deceased
employee who left behind no widow, the child shall take two thirds and the remaining
third shall go to the parent or parents, who take equal shares.
3. In the absence of a widow (or widower), parents, brothers and sisters, the
compensation shall be distributed equally among the children of the deceased. If there is
only one child, he shall be paid the whole compensation.
4. If there are only parents, who were under his care, in the absence of a widow (or
widower) and children, the compensation shall be divided equally between the parents. If
there is only one, he or she shall take the whole compensation. Brothers and sisters who
were supported by the employee at the time of his death shall be treated in the absence of
parents as parents.
APPENDIX B

THE QUESTIONNAIRE

1. The cover letter

The following is the cover letter, which has been submitted with the questionnaire to the construction contractors surveyed.

Dear Sir or Madam,

My name is Noura Alkaabi, a teaching assistant in the University of the UAE and currently a student at Ohio State University in the United States of America.

I am doing my master degree in the field of construction engineering and management. My master thesis is covering the safety performance in construction operation in the United Arab Emirates. I have developed a questionnaire that will help in the data collection required for thesis completion and I need your contribution in answering this questionnaire.

Any information submitted or provided will be confidential and will be used for the purpose of the research only. no data will be published without the written authorization of your company.

Thanks for your help and cooperation,
Noura Alkaabi
2. The Questionnaire

A. General Information about the company:

1. What is the size of the company in terms of employees?
   a. Less than 20
   b. 20-50
   c. 50-80
   d. 80-110
   e. +110

2. For how many years have you been in business?
   a. Less than 1 year
   b. 1-3 years
   c. 4-10 years
   d. +10

3. Circle the equipment your company own:
   a. Excavator
   b. Crane
   c. Derricks
   d. Tower crane
   e. Motor Driller
   f. Pick ups
   g. Others (list): ___________________________________________________________

4. What kinds of buildings does the company usually build?
   a. Residential Buildings
   b. Commercial Buildings
   c. Industrial Buildings
   d. Others (specify): __________________________________________________________

B. Equipment Safety:

5. Does the company maintain the equipment it owns on regular basis?
   a. Yes
   b. No
6. Does the company have its own maintenance staff?
   a. Yes
   b. No

7. Does the company inspect construction tools (hammers, ladders, etc...) before workers use them?
   a. Yes
   b. No
   - If yes by whom, (company staff), this inspection is done? ____________________________

C. Worker Safety:

8. Does the company provide any kind of insurance for its worker?
   a. Yes
   b. No

   If yes, what kind of Insurance?
   c. Health Insurance
   d. Life Insurance
   e. Others. Describe: ____________________________________________________________

9. Does the company have an orientation program for new workers on site?
   a. Yes
   b. No

   If yes, how many days prior to work? ____________________________________________

10. Do the company workers wear or use any Personal Protective Equipment during work?
    a. Yes
    b. No

   If yes, circle the Personal Protective Equipment they use:
   - Hard hats
   - Gloves
   - Eye Goggles
   - Welding Shields

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11. Does the company emphasize wearing Personal Protective Equipment?
   a. Yes

   If yes, how often does the company inspect workers wearing them during work?

   b. No
   If No, why?

   a. Workers productivity decrease with safety equipment
   b. Workers doesn’t like/refuse to wearing them
   c. Safety equipment is very expensive
   d. Others (Specify): 

D. Safety on Site

12. What safety methods on site does the company use?
    - None
    - Guard rails
    - Signs
    - Safety nets
    - Fences and shelters
    - Others

13. Does the company provide any fire extinguisher on site?
    a. Yes
    b. No

14. Does the company provide a lunch break for workers on site?
    a. Yes
    b. No

15. Does the company provide a special area for lunch on the construction site?
    a. Yes
    b. No
16. Does the company provide drinking water on the construction site for its own workers?
   a. Yes
   b. No

17. Does the company provide temporary toilets for workers on site?
   a. Yes
   b. No

18. Does the workers clean the site on regular basis?
   a. Yes
   b. No

19. Does the company have any drug prevention programs?
   a. Yes
   b. No

20. Does the company provide a first aid kit(s) on site?
   a. Yes
   b. No

21. Does the company have safety personnel on site?
   a. Yes
   b. No

E. Accidents and Injuries History and Procedures:

22. If an accident happened on the construction site what will you do?
   a. Call ambulance
   b. Call police
   c. Do nothing
   d. Others (Specify):

23. Has the company ever experienced a fatal accident or injury during construction?
   a. Yes
   b. No
If yes, Approximately how many?
   - 1-5
   - 6-12
   - 13-20
   - +20

24. Did any of those accidents involve non-employees?
   a. Yes
   b. No

25. Circle all the accidents that your crews experienced in the construction job site:
   - Falls from elevation
   - Fall from ground level
   - Electrocution
   - Struck by equipment
   - Struck by falling material
   - Caught in equipment
   - Caught in material
   - Cave-in
   - Explosion
   - Fire
   - Asphyxiation
   - Drowning
   - Natural causes

26. If one of your workers got injured what would you do?
   a. Replace him with a temporary worker
   b. Wait until he is capable or returning to the site
   c. Lay him/her off and employee another worker
   d. Others (Specify): ________________________________________________________

27. Does the company keep a record of accidents and injuries that happened to workers in your company?
   a. Yes
   b. No

F. Safety Organizations:

28. Does Injuries or accident affect the company workers on a negative way?
   a. Yes
   b. No
29. Do injuries and accidents affect your company reputation?
   a. Yes
   b. No

30. If an accident or an injury happened in the construction site does it:
    - Increase the cost of your work?
      a. Yes
      b. No
    - Reduce the productivity of your crews?
      a. Yes
      b. No
    - Delay the project?
      a. Yes
      b. No

31. Is there any agency or government organization that inspects construction site safety?
   a. Yes (mention them) -----------------------------------------------
   b. No

32. Are there any fines regarding injuries or accidents that the contractor has to pay?
   a. Yes
   b. No

33. Is your company concerned about safety in construction job site?
   a. Yes
   b. No

34. How would your company accept a safety program for the workers during construction?
   a. Welcome it, because we need it
   b. We already have our own safety program
   c. Neutral
   d. Others (Specify): --------------------------------------------------
LIST OF REFERENCES


Federal law No 8 Year 1980 Re, Regulation of Labor Relations and its Amendments and Order issued in Implementation Thereof, Ministry of Labor and Social Affairs.


Nazmy, A. S., (2001). Personal Interview, Al-Ain, UAE.


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