

Evaluation and Comparison of Construction Safety Regulations in Kuwait Government Sectors

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Abstract - Occupational safety in the construction field is an essential part of project management and must be at each phase of the project. This paper aims to evaluate construction safety regulations in Kuwait government sectors through a comparative study method covering the three most essential government sectors: Kuwait Municipality (KM), The Ministry of Public Works (MPW), and The Public Authority for Housing Welfare (PAHW). The study indicates that MPW's construction field safety regulations follow the international safety standards more than the two other sectors. This study discusses the necessity for a national body that provides a preventive safety measure towards construction projects' health and safety. The governmental organizations are held accountable for developing, unifying, and implement safety measures legislation, regulation, and guidelines systems nationwide to comply with international safety standards. Contractors should present legal documents that support the health and safety of the project's workers and users.

Keywords: Occupational, safety, project, regulations, construction , Kuwait

1. INTRODUCTION

A construction site is a high-hazard location. According to Occupational Safety and Health Administration (OSHA), more than 20 percent of all worker-related fatalities in the United States happen in the construction industry (BigRentz, Inc 2021). According to the UN's ILO, the top causes of deaths on construction sites as of April 2019 is: (Falls, Electrocution, Crush injuries, Caught-between injuries, Crane collapse, Fires, Asbestos, ionizing radiation, and cancer-causing chemicals, Slips, Exhaustion, Heat strokes) (Ranju Warriar 2019).

Several workers suffered from job injuries in construction sites, and some of these injuries are fatal; site injuries are a high-cost incident on the project budget. Construction site reports and analysis conclude that most accidents cause falls from elevations, motor vehicle crashes, electrocution, and machine accidents. These accident expenses are attributed to medical costs, compensation benefits, liability property loss, overdue schedule penalty, and supervisory time loss.

This paper provides a comparison between the safety regulations of three governmental sectors: the Kuwait Municipality (KM), the Ministry of Public Works (MPW), and the Public Authority for Housing Welfare (PAHW) to study the spots of shortage in each sector's regulations and to clarify the effectiveness of applying these regulations.

2. OBJECTIVES

- a. Identify the best construction safety system and regulations.
- b. Classify safety systems and regulation terms according to the range of seriousness over workers' and citizens' lives.
- c. Evaluation of construction occupational in different government sectors according to the OSHA standards.
- d. Study the possibility to unify safety systems and regulations in the government sectors.
- e. Propose construction safety automation for application and field control.

3. Methodology:

Research discussion and conclusion achieved through the following methodology steps:

- A. Collect and specify systems, laws, and regulations in construction safety fields, especially in the governmental sector.

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- B. Collect and categorize safety terms in the three governmental sectors (Kuwait KM, MPW, and PAHW in one comparative table according to specified items.
- C. Classify safety terms in respect of five severity levels according to the worker's and citizen's safety in the three governmental sectors.
- D. Classify safety terms in respect of adequacy degree to the OSHA standards, and perform a comparative study between governmental sectors in specified issues

4. JOB SITE-SAFETY

Safety is an essential part of project management planning. It should show a respectful concern at all project phases and levels. The economic costs and regulatory requirements show the importance of project safety procedures. Basic principles and approaches should apply to safety procedures; they must be designated to the project and monitored as scope. Construction projects consist of many potential hazards, such as:

- Working at height
- Moving Slips, trips, and falls objects
- Hand-arm vibration syndrome
- Collapsing trenches
- Electricity
- Airborne fibers and materials.

Delivering the project is the responsibility of the project manager individually; however, it is a well-established principle that the project management and all parties involved, including the contractor. The project manager must work closely with his team members to include safety philosophy in all project phases; it is wise to start a safety procedure at the top organization, infuse by words and actions to all job-site levels. As a construction site considered a high hazard area, safety requires everyone's full attention. Teamwork effort is needed to implement safety procedures to prevent accidents, which costs a lot when neglected. In recent years, costs escalated due to work stoppage, loss of supervisory, and employee injury time. Retaining an ergonomics systems approach can shape the circumstances of a workplace environment; researchers have shown that safer job-site managers are the better producers. This study proposes a model to indicate an organization's manner regarding the safety of a construction site, in which project managers are better at keeping costs down and job on schedule.

The concept of a safe environment is relatively new; project managers tend to concentrate on getting the job done and tolerate poor safety standards. It is a false strategic idea; that safety procedures can push up the project's budget. The Occupational Safety and Health Administration (OSHA) released a guideline for Safety and Health practices programs; it recommends a step-by-step approach to successfully implement the seven core elements program "osha.gov/shpguidelines – OSHA 3885 – October 2016". OSHA refers that job-site safety management levels up

productivity and performance, and governmental bodies should carry it out. Governmental public contract bodies generally qualify contractors through criteria based on technical qualifications, experience, and bidding price. They need to add contractor's safety records in the requirements to achieve safety and health goal.

5. JOB SITE SAFETY ADMINISTRATION

Following the conducted survey and constructions sites visits of Kuwait projects, several procedures are proposed to achieve the best site safety and health:

- Safety Responsibility
- Accident Reporting/Record Keeping
- Posting Requirements
- Job Site Inspections
 - Weekly inspections to identify hazards
 - Prompt correction.
- Injury and incident investigations
- Provide medical Facilities

6. JOB SAFETY ANALYSIS

Job Safety Analysis is a crucial prevention tool. It helps prevent accidents at a worksite by finding hazards and minimize the cause before workers perform the job. It should be performed regularly to determine how far safety rules are implemented and to spread awareness through the workers. Safety Analysis includes a set of duties as follow:

- Job Site Inspection
- Identifying Site Hazards
- Multi Security Points Inspection
- Developing a written plan for Job-Site Safety and Loss Control

Thorough Review of the Job Site identifying the action necessary to make the worksite as safe as humanly possible through the following safety areas:

Personal Protective Equipment: gloves, respirators, hearing protection, eye coverings, chemical resistant clothing, protective footwear, fall protection, and any other necessary personal safety equipment.

Environmental Hazards: airborne particles, heat stress, confined ventilation, hot/cold surfaces, restricted lighting, noise, restricted access/egress, and any other environmental concerns.

Body Hazards: fall potential, pinch points, slip/trip potential, electric shock, and other body hazards.

Hazard Communication: provides and discusses physical and health hazards by specifying training to

cover potential risks related to the job site. It includes labeling, the safety data sheet, and hazard information.

The safety officer must present a written safety plan and communicate it to all employees. They should receive safety instruction, training, and signed acknowledgment to understand and agree to follow and comply with safety rules.

7. JOB SITE ORIENTATION

Job site orientations can provide valuable information that will help reduce injuries and accidents. To accomplish this, it should mandate and last long enough to better understand what the site expects. Employers should provide training to their employees whenever exposed to occupational hazards. For instance: if you require employees to work from scaffolding, you must provide them with training on scaffolds. This training is to familiarize employees with the dangers of this job to help prevent accidents and injuries. The Job Site Orientation should contain at a minimum the following:

1. Site-Specific Emergency Action Procedures:
 - Publish the emergency action plan to prevent confusion in an emergency.
 - Conduct Emergency Evacuation Procedure.
2. Site-Specific rules and regulations:
 - Publish site-specific rules and regulations and any updates that may be different from other job sites.
 - Mandate any additional safety rules, even if it an optional requirement in the general safety regulation.
3. Expectations of danger:
 - Risks expectations should be shared and explain due to any job hazard.

An overview of Government Sectors Safety Regulations in Kuwait:

Safety terms in regulations of three government sectors: (KM), (MPW), and (PAHW) collected along 112 items representing eight main safety outline issues (attached). The results are classified according to (OSHA) standards in table (1).

Table (1) degree of adequacy of government sectors regulations to standards

Topic	Government sector		
	KM	PAHW	MPW
Citizens' safety	Good	Good	Good
Workers' safety	Poor	Good	Excellent
Property and Facilities safety	Moderate	Moderate	Moderate
Excavation safety	V. good	V. good	V. good
Emergency Safety Plan ESP	Poor	Poor	V. good
Before work commencement	Good	V. good	V. good
Road works safety	Moderate	Good	Good
Environment preservation	Poor	Poor	Poor

The results show that the KM regulations care less about the workers' safety regulations while MPW offers excellent care. Also, the table indicates the lack of ESP in KM and PAHW regulations, while it appears in MPW regulations. Moreover less consideration of environmental issues in the three sectors.

This study covers how often contractors break the safety regulations and what penalty level is applied to them. It is necessary to include the penalty level and amount in the contravention report. KM and PAHW contravention report did not include the penalty level and amount. On the other hand, MPW had this information.

In general, MPW safety regulations have a good approach to OSHA standards, while KM safety regulations have an inadequate safety system. One hundred and twelve (112) terms have been considered; these regulations were classified according to the severity level related to workers and citizens safety as follows:

- Level 5: Fetal or permanent disability (classified for 22 regulation terms).
- Level 4: Temporary disability (classified for 10 regulation terms).
- Level 3: Injury needs hospital medication (classified for 11 regulation terms).
- Level 2: Properties damage or minor injury (classified for 28 regulation terms).
- Level 1: Accident Leads to project delay (classified for 41 regulation terms).

A mathematical percentage equation indicates how often safety terms are used for each severity level. The high percentage reflects the sector's concentrating area in respect of severity level. Table (2) shows the rate for each sector.

Percentage of Safety Terms Vs. Severity Level in Government Sector					
S. Level Sector	5	4	3	2	1
KM	33%	0	0	17%	50%
PAHW	28%	6%	4%	9%	53%
MPW	21%	9%	12%	25%	33%

Table (2) percentage of safety terms for severity level in three governmental sectors

The results show that most safety terms in government sectors are classified under severity level (1), while severity level (5) came second in order. The remaining severity levels have low importance in regulations, indicating that government sector regulation concentrates on class levels (1) and (2). Except for the MPW sector, that fairly distribute focus on all five severity levels.

8. Conclusions:

Health and safety in construction projects are essential; it is part of the project's management representing several regulations that apply to construction projects. These construction regulations aim to provide health and safety practice guidance and a framework in construction projects.

The study focused on the local government bodies involved in big construction projects, and it aims to reduce hazards in construction sites in Kuwait. Based on documents and the survey reviewing and information analysis, the current state discloses a lack of safety procedures at certain severity levels. Based on this study and international safety recommendation, several facts and concern concluded:

1. MPW safety regulations in the construction field have an excellent approach to standards, while PAHW has a moderate system; however, KM safety regulations have an inadequate approach to standards.
2. The KM does not mention the workers' safety regulations, while MPW shows excellent matching to standards concerning workers' safety.
3. The penalty amount does not appear in KM and PAHW contravention system and regulation. In comparison, it shows in the MPW system.
4. Poor presence of Emergency safety plan in KM and PAHW regulations while it presented fairly in MPW regulations.
5. MPW, KM, and MPW all lack environment preservation, property, and facilities safety regulation.
6. Although the KM, MPW, and PAHW represent one government, each authority has an independent safety regulations book, and they act as three different bodies.

7. Most of the safety terms in government sectors concentrated on severity level (1) and level (5), respectively.
8. MPW regulation terms have a balanced distribution of severity levels.

9. Recommendations:

1. Activate KM safety committee inspection on construction sites.
2. Unified safety regulations in the government sectors compile with international safety standards.
3. Consider contractor's safety record as part of evaluating construction bids.
4. Demand Qualified Safety Engineers for each project.
5. Establish an independent team to implement safety philosophy on construction job-site. However, the current practice places final responsibility on the contractor.
6. Conduct a job site safety orientation to reduce accidents, injuries, and reduce confusion in emergencies.
7. A written safety plan is essential to Job Safety, and it is not complete until communicated to all employees.
8. Leadership commitments have a tremendous effect on safety programs; it is critical to implement and activate them. With clear management objectives, individual quality is the key to implantation safety policy and achieve successful safety.
9. Establish a governmental organization; its main concern is construction site safety to minimize accidents by providing a safe environment. Its primary mission is to legislate safety regulations and apply them.

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