

## The Availability of Specialized and Occupational Health and Safety Curricula in Sana'a University-Yemen.

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© 2023 جامعة العلوم والتكنولوجيا، المركز الرئيس عدن، اليمن. يمكن إعادة استخدام المادة المنشورة حسب رخصة مؤسسة المشاع الإبداعي شريطة الاستشهاد بالمؤلف والمجلة.

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## The Availability of Specialized and Occupational Health and Safety Curricula in Sana'a University-Yemen.

### **Abstract:**

Abstract: The wide spread of injuries, diseases, accidents and pollutions in Yemen related to the poor awareness of safety practices of workers is considered the main reason and the root Cause of weak occupational/ specialized health and safety practices, applications, awareness and qualification in Yemen. Therefore this study aims to measure the existence of occupational and specialized health and safety curricula within different specializations of Sana'a University's educational curricula and plan which might be relevant to this weakness- This study started studying all colleges and sectors curricula's to evaluate and measure the existence of OSH<sup>1</sup> curricula, subjects, specializations within the university, and comparing it with suggested check list curricula's which was design upon risk assessment of each section specializations and relevant legalization and standards requirements ,The results indicate a total absence of OSH curricula in the university which justify the weak outputs of the university (graduates), Then a set of recommendations were produced to solve this issue and help developing the university educational system in Yemen.

**Keywords:** Safety in Yemen, High Education in Yemen, OSH in Yemen, OSH curricula in Universities, Sana'a University

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<sup>1</sup> Occupational Safety and Health.

## قياس وجود مناهج الصحة والسلامة المهنية والمتخصصة ضمن المناهج والخطة التعليمية في التخصصات المختلفة لجامعة صنعاء

الملخص:

إن الانتشار الواسع للإصابات والأمراض والحوادث والتلوث في اليمن المتعلقة بضعف الوعي بممارسات السلامة لدى العمال، تعتبر السبب الرئيسي والجذري لضعف ممارسات الصحة والسلامة المهنية / المتخصصة والتطبيقات والتوعية والتأهيل في اليمن. لذلك تهدف هذه الدراسة إلى قياس وجود مناهج الصحة والسلامة المهنية والمتخصصة ضمن المناهج والخطة التعليمية في التخصصات المختلفة لجامعة صنعاء التي قد يكون غيابها سبباً في هذا الضعف - بدأت هذه الدراسة بدراسة جميع مناهج الكلية والقطاعات لتقييم وقياس وجود المناهج والموضوعات الدراسية المرتبطة بالصحة والسلامة المهنية والبيئية والتخصصات داخل الجامعة، ومقارنتها مع المناهج المقترحة في قائمة تحقق التي تم تصميمها بناءً على تقييم مخاطر كل قسم من التخصصات والمتطلبات القانونية والمعايير ذات الصلة، وتشير النتائج إلى الغياب التام لمناهج الصحة والسلامة المهنية في الجامعة مما يبرر ضعف مخرجات في الجامعة (الخريجين)، ثم وضع مجموعة من التوصيات لحل هذه المشكلة والمساعدة في تطوير نظام التعليم الجامعي في اليمن.

الكلمات المفتاحية: السلامة في اليمن، التعليم العالي في اليمن، الصحة والسلامة المهنية في اليمن، مقررات ومناهج السلامة الجامعية، جامعة صنعاء.

## 1. Introduction

The absence of highly qualified human resources in the specialized safety field is considered the main reason of the lack of safety practices which caused catastrophic impacts in Yemen which is considered the main reason of the absence and weak occupational/ specialized health and safety practices, applications and awareness in Yemen, Which lead to disastrous consequences like accidents, occupational sickness/injuries, deaths, wide pollution and poisoning, The spread of epidemics and diseases, low quality of products and losing trust of in Yemeni graduators capabilities & qualifications (unsuitable with Labor and Market's needs), therefore it was a necessary to conduct this research by analyzing the existence of safety subjects within the curricula of Yemeni's universities starting with Sanaa University as a case study, besides analyzing the factors related to that absence, and setting up a set of recommendations which the researcher deeply believes will help solving this huge problem and weakness.

### 1.1 Definition of Occupational Safety, Health and Environment:

Occupational safety and health is identified by International Labor Organization (ILO)<sup>2</sup> as "The discipline of dealing with prevention of work-related injuries and diseases as well as the protection and promotion of the health of workers. It aims at the improvement of working conditions and environment".

### 1.2 Importance of the study:

- a. Previous researches referring to the poor application of safety and the accordance of huge disasters, accidents and injuries, pollution to the poor qualifications of the university's graduates caused by the absence of OSH courses within high education curricula [1], [2].
- b. The absence of researches in this field gives an additional importance to this study.
- c. It will justify the weakness of OSH practices in Yemen, as it reveals the root cause of it.
- d. It will help to improve and guide high education system by reflecting the actual needs of the labor market with the educational systems.
- e. It will help to minimize the rate of occupational hazards and its implications in the society.
- f. Including safety and health requirements will improve the quality of universities.
- g. It will support enforcing national and international legislations and Standards [see Appendix]<sup>3</sup>.
- h. It will improve the quality of the universities outcomes, by producing well- qualified graduates that suite the needs of local, regional, and global labor market and minimizes the rate of unemployment.
- i. This study goes along with the global efforts of spreading the culture of OSH and environment.
- j. The researcher believes that the major importance of this study is not about its results but the checklist it countians, which, in the researcher's opinion, is considered as a standard measurement tool of further studies and a helpful guide to future development of universities curricula in Yemen or in the Arab world.

<sup>2</sup> International Labor Organization website, [www.ILO.org](http://www.ILO.org).

<sup>3</sup> The checklist was designed upon these legalistations and Standards.

### 1.3 The Beneficiaries:

The figure bellow describes the Beneficiaries of this study:

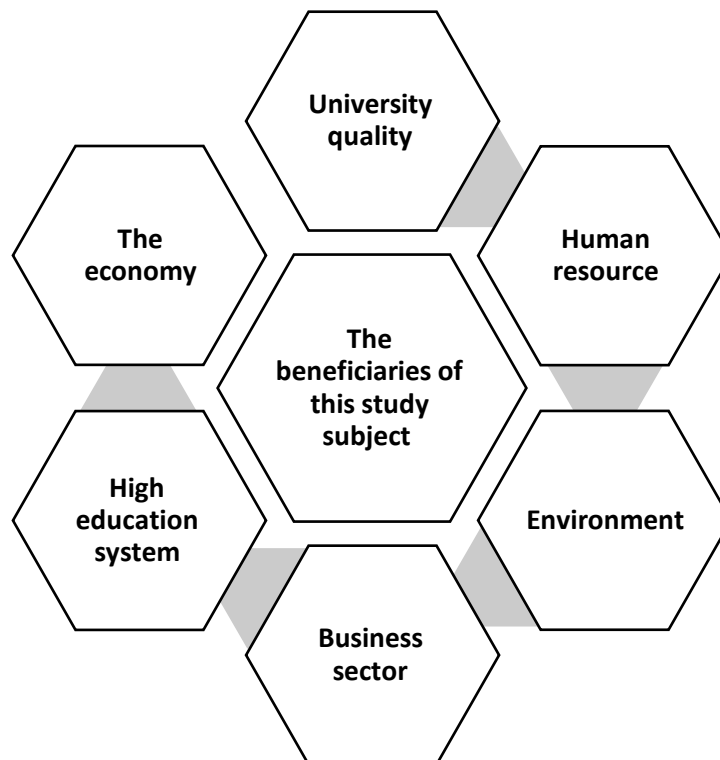


Figure (1) shows the beneficiaries of this study.

## 2. Materials and Methods:

### 2.1 Study Plan:

This study was planned via sequenced steps described as follows:

- a. Designing a list of suggested OSH list for each college according to the researcher's knowledge/ evaluation, and risk assessment of colleges specialization, conducted upon international standards and real needs of university outputs qualifications the witnessed phenomenon. (NOT CLEAR)
- b. Collecting each colleges courses list.
- c. Searching for the existence of any OSH curricula by comparing the suggested OSH list with the Colleges Courses list.
- d. Analyzing the checklist results and studying them.
- e. Finalizing, reviewing, arbitration and directing this scientific paper

### 2.2 Study procedures:

The study started by collecting all university colleges and sections specialization study plans, then analyzing and suggesting OSH curricula of each sector in accordance with hazard assessment of each sector, then a checklist was designed to study the existence of occupational and specialized safety and health suggested/ needed subjects or curricula to be taught in each college and sector, then comparing

the suggested list with the existing list of curricula of every college and sectors list of curricula.

### 2.3 Checklist Designing:

The researcher designed the checklist to suit the following:

- a. Most important and safety curricula needed in each college according to its specializations.
- b. The OSH's subjects were carefully and scientifically selected upon the international standards, legalization. [see appendix] and approaches in safety and the estimated subjects needed to solve the issues and disastrous phenomena existing in Yemen.
- c. The researcher summarizes the college's OSH suggested subject as follows:

Medicine	Commerce & economy	Oil and gas	Agriculture
Infection Control	Occupational Safety & Health	Occupational Safety & Health	Industrial Safety
Medical Waste Management	Safety Management System	Oil and Gas Safety	Occupational Safety & Health
Medical Safety	OSH laws & Cases	Chemical security & safety	Chemical security & safety
Lab Safety	Engineering	Construction Safety	Biosafety & Security
Patient Safety	Occupational Safety & Health	Lab safety	Lab Safety
Environmental Cleaning	Construction Safety	Electrical Safety	Environmental Cleaning
Epidemic safety	Electrical Safety	Safety Management Systems	Environmental Safety
Healthcare Safety Standards	Safety Standards	Environmental Safety	Waste Management
Chemical Security & Safety	Safety and firefighting Systems	Sciences	Veterinary
Biosafety & Security	Chemical Security & Safety	Industrial Safety	Industrial Safety
Radiation Safety	Transportation Safety	Occupational Safety & Health	Occupational Safety & Health
GMP & Drugs Safety	Industrial Safety	Chemical Security & Safety	Veterinary Safety
Emergency Medicine	Environmental Cleaning	Biosafety & Security	Chemical Security & Safety
Occupational Medicine	Environmental Safety	Lab Safety	Biosafety & Security
Education	Safety Management Systems	Hazardous Waste Management	Lab Safety
Educational Safety	Computer	Radiation Safety	Waste Management

School Safety and Health	Occupational Safety & Health	Environmental Cleaning	Environmental Cleaning
Literature	Electric Safety	Environmental Safety	Environmental Safety
Occupational Safety & Health	Law		
Construction Safety	OSH laws & Cases		

Table (1) suggested OSH curricula in each College and sections

## 2.4 Sample of the study

The researcher has chosen Sana'a University as a sample for this study upon the following reasons:

- Sana'a University is the biggest, most recognized, well accredited university in Yemen.
- This university is considered as the ideal and model for other universities.
- Sana'a University has the most variant and completed specializations in Yemen.
- Highest expectations to get cooperation from its personnels and authorities and the promises received to provide needed assistance from the University high research Department, but the university rejects to cooperate with the researcher
- This research was accomplished under the civil war conditions and because of that this university, unlike other universities, is the only one that still maintaining and operations.

In Sana'a University there are 11 groups of colleges<sup>4</sup> (Medicine- Commerce & economy-Engineering-Oil and gas-Education and language-Literature-Agriculture-Veterinary-Sciences-law-Computer) [3] each has different sectors, in total all colleges specialization requires specialized OSH curricula depending on its specifications, specialty, locally needed skills, contemporary standards and scientific methods/approaches/systems, and national and international laws/guides/treaties [5] ...etc.

## 2.5 Previous studies:

Unfortunately, no researches were found in this specific field, therefore this study might be the first if its kind in Yemen, but previous studies refer to poor high education outputs and the absence of OHS courses in the universities.

## 3. Results:

### 3.1 The Checklist results:

<sup>4</sup> Sana'a University official website, [www.su.edu.ye](http://www.su.edu.ye), 2021.

College	Occupational and Specialized Health and Safety Subjects	Existence	Notes
<b>Medicine</b>	Infection Control	No	
	Medical Waste Management	No	
	Medical Safety	No	
	Lab Safety	No	
	Patient Safety	No	
	Environmental Cleaning	No	
	Epidemic Safety	No	
	Healthcare Safety Standards	No	
	Chemical Security & Safety	No	
	Biosafety & Security	No	
	Radiation Safety	No	
	GMP & Drugs Safety	No	
	Emergency Medicine	No	
	Occupational Medicine	No	
<b>Commerce &amp; Economy</b>	Occupational Safety & Health	No	
	Safety Management System	No	
<b>Engineering</b>	Occupational Safety & Health	Yes	As a Course: shortened – outdated
	Construction Safety	No	
	Electrical Safety	No	
	Safety standards	No	
	Safety and firefighting Systems	No	
	Chemical Security & Safety	No	
	Transportation Safety	No	
	Industrial Safety	No	
	Environmental Cleaning	No	
	Environmental Safety	No	
	Safety Management Systems	No	
<b>Oil and Gas</b>	Occupational Safety & Health	No	
	Oil and Gas Safety	No	
	Chemical Security & Safety	No	
	Construction Safety	No	
	Lab Safety	No	
	Electrical Safety	No	
	Safety Management Systems	No	
<b>Education and Language</b>	Environmental Safety	No	
	Educational Safety	No	
<b>Literature</b>	School Safety and Health	No	
	Occupational Safety & Health	No	
<b>Agriculture</b>	Construction Safety	No	
	Industrial Safety	No	
	Occupational Safety & Health	No	
	Chemical Security & Safety	No	



	Biosafety & Security	No
	Lab Safety	No
	Environmental Cleaning	No
	Environmental Safety	No
	Waste Management	No
<b>Veterinary</b>	Industrial Safety	No
	Occupational Safety & Health	No
	Veterinary Safety	No
	Chemical Security & Safety	No
	Biosafety & Security	No
	Lab Safety	No
	Waste Management	No
<b>Sciences</b>	Environmental Cleaning	No
	Environmental Safety	No
	Industrial Safety	No
	Occupational Safety & Health	No
	Chemical security & Safety	No
	Biosafety & Security	No
	Lab Safety	No
<b>Law</b>	Hazardous Waste Management	No
	Radiation Safety	No
	Environmental cleaning	No
	Environmental safety	No
<b>Computer</b>	OSH laws & Cases	No
	Occupational Safety & Health	No
	Electric Safety	No

Table (2) Checklist results.

### 3.1.1. Results summary:

Colleges Name	Suggested Subjects N	Existed		Not Existed		Notes
		Number	present	Number	present	
<b>Medicine</b>	14	0	0%	14	100%	
<b>Commerce &amp; Economy</b>	2	0	0%	2	100%	
<b>Engineering</b>	11	1*	9%	10	81%	Shortened & outdated
<b>Oil and Gas</b>	8	0	0%	8	100%	
<b>Education</b>	2	0	0%	2	100%	
<b>Literature</b>	2	0	0%	2	100%	
<b>Agriculture</b>	8	0	0%	8	100%	
<b>Veterinary</b>	9	0	0%	9	100%	
<b>Sciences</b>	9	0	0%	9	100%	
<b>Law</b>	1	0	0%	1	100%	
<b>Computer</b>	2	0	0%	2	100%	
<b>Sum</b>	68	1	1.4%	67	98.6%	

Table (3) summary of the results

#### 4. Discussion

- a. The results indicate a total absence in OSH subjects in the university only (1.4%).
- b. All colleges curricula suffer from total absence of occupational and specialized safety and health subjects.
- c. There are no specific specialization or section in occupational or specialized safety and health in all university sections.
- d. There are no specific college of occupational safety and health in the university.
- e. Within all subjects and curricula of the university only one college which is Civil Engineering included a course of occupational safety and health with its subjects list, and this subject is very shortened and old and lacking international standards.

#### 5. Conclusion

The results clearly indicate a total absence of OSH subjects in Sana'a University curricula, which justifies the accordance of catastrophic phenomena such as accidents, plagues, and pollutions in Yemen due to weak qualification, knowledge, skills and attitudes of university graduates in OSH.

- a. Extreme and total absence of occupational and specialized safety and health in University's curricula.
- b. The outputs of the university will suffer from a huge shortage of safety.
- c. An obvious poor performance of university's developmental activities.
- d. The author felt a total ignorance of the importance of safety within the leadership or academics in the university.
- e. The rejection of cooperation with this research may indicate an embarrassment of performance or/and shortage of transparency of the university activities.
- f. The absence of occupational and specialized safety and health in Sana'a University indicates that other public universities has also the same problem.
- g. Poor high education development performance.
- h. The absence of OSH subjects may refer to the weak qualifications of the academic staff, and also indicates a huge absence of academic training and capacity building.

#### 6. Recommendations:

- a. An urgent need to establish need assessment of the university performance and the development of its curricula to insert OSH subjects.
- b. The ministry of high education and scientific research must enhance its efforts in the development of higher education field.
- c. More researches must be accomplished in other public and private universities and high diploma technical and medical institutes.
- d. The need for creating mechanism for filling the gap between market needs and higher education curricula to insure the suitability of university outputs.
- e. Due to the scarcity of OHS academics, the researcher recommends to attract OHS experts and professionals to assist in developing and executing OSH curricula in the universities.
- f. The researcher recommends to enhance the transparency and cooperation of university and other scholars.

## 7. Acknowledgement

To Ms. Wafaa Al-Sohpany for the academic review, the IJFOSH2 [1] and CSDY [4] teams for providing the opportunity of preparing and discussing this paper in their scientific conferences, Science and Technology University for its approval of publishing this study in its scientific journal.

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## 9. Appendix:

### 9.1 Law:

#### 9.1.1. Industrial and Institutional laws:

- Law No. (20) of 2010 - Regulating Industry
- Law No. (28) of 2010 - regarding industrial designs
- Local Authority Law No. 4 of 2000 Amendment 71 - 2000 and Amendment 25 – 2002
- Yemeni Companies Law.
- Construction Law, Ministry of Public constructions.
- 33 - 2003 Land Transport
- 1 - 1995 Acquisition for the public benefit
- 20 - 1995 urban schematic

#### 9.1.2. 21 - 1995 Land and real estate of the state

- 39 - 1991 Land Registry
- 44 - 1991 Specifications, Metrology and Quality Control
- List of revenues and fees for Yemeni ports services and facilities
- 17 - 2004 Regulating and protecting livestock
- 32 - 1999 Botanical Stone.
- 15 - 1994 Naval
- Amendment 13 - 2002 38 - 1992 Food control and circulation regulation
- Amendment 8 - 199721 - 1994 Antiquities

#### 9.1.3. Environmental and Water Laws:

- Law No. (26) for the year 1995 AD - regarding the protection of the environment
- Law No. (33) of 2002 - regarding water

- The Law on the Establishment of Cleaning and Improvement Funds
- Law 39 – 1999 of Public Hygiene
- Public Health and Environmental Protection Resolution and Violations
- Law of the National Atomic Energy Commission
- Law No,7 - 1999 regulating and handling agricultural pesticides
- 16 - 2004 Protection of the marine environment from pollution

#### **9.1.4. Healthcare laws:**

- Law No. 14 - 2009 - Regarding Public Health
- Yemeni National Infection Control Guide 2021.
- Law of Private Medical Facilities, Ministry of Public Health
- The National Directory of Hospitals in the Republic of Yemen 2019 AD Ministry of Public Health
- National Guide to Medical Waste Management 2020 AD Ministry of Public Health
- Infection Control Standards Assessment Tool for Medical Facilities - 2020 Ministry of Public Health

#### **9.1.5. Labour, Health and Safety and Emergency Laws:**

- Labour Law No. (5) of 1995, as amended by Law No. (25) of 1997
- Civil Défense Law, Ministry of Interior
- Insurance and Pension Law
- Yemeni Income Tax Law
- 2 - 1999 Zakat Law
- 35 - 2002 Regulating Trade Unions
- 45 - 2002 Child Rights
- 24 - 1992 Edit - 26 – 1997 of Juvenile care
- 15 - 1995 - Amendment 27-1997 of Vocational Training Fund
- 40 - 1992 Regulating the Carrying of Arms.

#### **9.1.6. International treaties<sup>5 6</sup>:**

- Conventions relating to the preservation of animals and plants in their natural state signed in London in the year 1923.
- The International Convention for the Prevention of Pollution of the Seas from Dumping of Wastes and Other Substances (London Convention of 1972).
- Treaty on the Prohibition of the Traffic in nuclear weapons signed in Moscow in 1963.
- The Convention on Wetlands of International Importance as a Habitat for Waterfowl called the Ramsar Convention, adopted in 1997.
- The Convention for the Protection of the Mediterranean Sea from Pollution, which was adopted in Barcelona in 1979.
- Convention on the Conservation of Migratory Wild Animals, adopted in Bonn in 1979.
- The United Nations Convention on the Law of the Sea, signed in 1982 in Vienna.
- Convention for the Protection of the Ozone Layer signed in Vienna in 1985.
- The CITES Convention Concerning International Trade in Endangered Species of Wild Animals, which was adopted in 1973 and ratified by the Republic of Yemen in 1997.
- The Convention on Biological Diversity, adopted in Rio de Janeiro, Brazil, in 1992, and ratified by the Republic of Yemen in 1995.
- International Convention to Combat Desertification for the year 1994.

<sup>5</sup>Holm akhdhar NGO, considered of Environment in Yemen <https://holmakhdar.org/laws/2300> ,June 2022

<sup>6</sup>Yemeni National Information Center,<https://yemen-nic.info/contents/Politics/itefaqeya.php>, June 2022

- The 1985 Vienna Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol on chlorofluorocarbons and carbonaceous substances that deplete the ozone layer.
- Universal Declaration of Human Rights
- International Covenant on Economic, Social and Cultural Rights
- International Covenant on Civil and Political Rights
- International Convention on the Elimination of All Forms of Racial Discrimination
- Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment
- Convention on the Elimination of All Forms of Discrimination against Women
- Convention on the Rights of the Child.
- The 1926 Slavery Convention, as amended by the 1953 Protocol
- Convention for the Suppression of Trafficking in Persons and the Exploitation and Lending of Others
- 1951 Convention relating to the Status of Refugees.
- Protocol to the Convention on the Status of Refugees.
- Convention No. (14) regarding weekly rest in industrial establishments (International Labour Organization).
- Convention No. (15) Concerning the Minimum Age for Employing Juveniles and Pilots or Assistants and Pilots (International Labour Organization)
- Convention No. (16) Concerning Compulsory Medical Examination of Children and Juveniles Employed on Board Ships (International Labour Organization)
- Convention No. (19) Concerning Equal Treatment of National and Foreign Workers in Respect of Compensation for Work Accidents (International Labour Organization)
- Convention No. 29 Concerning Forced or Compulsory Labour (International Labour Organization)
- Concerning the Minimum Age for Juvenile Employment in Maritime Work (Adjusted). (International Labour Organization)
- Convention No. (59) concerning the Minimum Age for Juvenile Employment in Maritime Work (amended). (International Labour Organization)
- Convention No. (64) Regulating Written Contracts of Employment for National Workers. (International Labour Organization)
- Convention No. (65) Concerning Penal Penalties for Violations of Contracts of Employment of National Workers. (International Labour Organization)
- Convention No. (81) Regarding Labour Inspection. (International Labour Organization)
- Convention No. (86) Concerning Employment Contracts (National Workers). (International Labour Organization)
- Convention No. (87) on Freedom of Association and Protection of the Right to Trade Union (International Labour Organization)
- Convention No. (94) Convention on Conditions of Work (General Contracts) (International Labour Organization)
- Convention No. (95) on the Protection of Wages. (International Labour Organization)
- Convention No. (98) Regarding the Application of the Principles of the Right to organize and Collective Bargaining. (International Labour Organization)
- Convention No. (100) Regarding Equal Remuneration for Male and Female Workers for Work of Equal Value (International Labour Organization)
- Convention No. (104) Regarding the Abolition of Penal Penalties for Breaching their Employment Contracts by National Workers. (International Labour Organization)
- Convention No. (105) Regarding the Abolition of Forced Labour. (International Labour Organization)
- Convention No. (111) on Discrimination in the Family

- Convention No. (122) on Labour Policy. (International Labour Organization)
- Convention No. (131) Regarding Fixing the Minimum Wage (with special reference to developing countries). (International Labour Organization)
- Convention No. (132) Regarding Paid Leave. (International Labour Organization)
- Convention No. (135) Regarding the Provision of Protection and Facilities to Workers' Representatives in Establishments. (International Labour Organization)
- Convention No. (138) Concerning the Minimum Age for Employment. (International Labour Organization)
- Convention No. 144 Concerning Consultations to Promote the Application of International Labour Standards. (International Labour Organization)
- Convention No. (156) Concerning Workers with Family Responsibilities (International Labour Organization)
- Convention No. (158) Concerning Termination of Employment by an Employer (International Labour Organization)
- Convention No. 159 on Vocational Rehabilitation and Employment of Persons with Disabilities. (International Labour Organization)
- Convention No. (182) on the Danger of Bad Forms of Child Labour (International Labour Organization)
- Convention Relating to the Status of Refugees
- Optional Protocol to the Convention on the Rights of the Child on the involvement of Children in armed Conflict
- Optional Protocol to the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography
- United Nations Convention against Corruption.

## 9.2. International Safety Standards:

- OSHA.
- NOISH
- NEBOSH.
- WHO.
- ILO.
- CDC.
- IEC
- IEEE.
- NFPA.
- ASTEM.
- IOSH.
- INSI.