

Rıfat AKBIYIKLI¹

Latif Onur UĞUR¹

Ali ATEŞ¹

S. Ümit DİKMEN²

Bilge AKBIYIKLI³

¹University of Düzce, Faculty of Technology, Department of Civil Engineering, Turkey

²Department of Civil Engineering, MEF University, Turkey

³Near East University, Graduate School of Social Sciences, Department of Business Administration, North Cyprus

SAFETY CULTURE IN TURKISH CONSTRUCTION SECTOR: THE CASE OF SMALL AND MEDIUM SIZED ENTERPRISES (SMES) IN SAKARYA AND KOCAELİ COUNTIES IN MARMARA REGION- TURKEY

Keywords: Safety Culture, Construction sector, Occupational safety, Questionnaire survey, Safety Management

Abstract

This paper is based on a regional study of safety culture in construction sector in Turkey. The research is based on a questionnaire survey. The main emphasis of the research is to map the significance of safety in Small and Medium Enterprises in Construction Sector on a regional basis. About 10% of all the accidents occurring in Turkey are within the construction sites and 32% of this percentage is resulting with loss of human life. Turkey has a high rank in occupational accident statistics in Europe and third worldwide. Health and safety is a costly issue. The costs of a sound health and safety system are considered as an economical burden to the construction projects. In the last 10-15 years, although the industry's performance has shown a steady long-term improvement, the rates of death and serious injury are still unacceptably high. The industry needs a major culture change towards human life in its projects. The collected regional data is analysed and the results are discussed.

Chapter 1. Introduction

The construction industry has more accidents of greater severity than any other industrial sector (Abdelhamid and Everett 2000); Gyi, Gibb and Haslam 1996)). The construction industry poses challenges for the management of Occupational Health and Safety risk (Lingard and Rowlinson, 1994). The industry is typified by one-off projects; a constantly changing environment; a highly competitive tendering system and a high turnover of labour (Lingard and Holmes, 2001). The construction industry is a male dominated predominantly blue-collar industry. Males have been found to be more resistant to participation in programmes designed to change workplace health and safety culture (Spillman, 1988) and workers in low skills-based, low technology industries are resistant to using more advanced technologies (Orlandi, 1986).

Construction has a number of characteristics making it inherently hazardous: large workforces involved in many operations; the site is continually changing as construction proceeds; workers do not have fixed worksites and must move around a structure under construction. The common aim and the intention of Health and Safety (H & S) regulations in every country are to improve the safety and welfare of construction activity. The legislative framework provides rules which not only guide, but restrict behaviour and action on construction sites in order to improve the safety performance of individual sites, and of the industry as a whole.

In construction many discrete elements are essential to Health and Safety (H&S). Those many elements can be encapsulated into three fundamental and interacting blocks, namely: plant; procedures; and people. To succeed requires all three to be of the highest quality and working in a harmony. It is the Management System that provides the necessary cementation to hold the blocks together and also the right environment to create a synergy effect.

According to (Griffith and Howarth 2000), the key driver to achieving a safe and healthy working environment is to ensure that H&S issues are assessed, planned, organized, controlled, monitored, recorded, audited and reviewed in a systematic way. An appropriate way for the principal contractor to address the legislative requirements, corporate business needs and practical project demands of health and safety is to establish a health and safety management system within the organisation and integrate the prevailing health and safety regulations in this management system.

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The main purpose of occupational safety is to minimise the events that damages the well-being of human beings to create a healthy and safe working environment. Main headings to obtain such a purpose are:

- Protection of employees
- Protection of production safety
- Production of the business environment

Why health and safety management? Main reasons are to prevent loss of work and occupational accidents, to prevent the loss of working human resources, to complete the work on time, and to protect and avoid business in paying unnecessary fines and indemnities. To do these tasks the construction industry employers must take certain steps to inform their employees their legal rights and responsibilities. These steps are, preparation of occupational health and safety education programs, arrangement of these educations, and make possible the employees to attend these programs. The dangers of work are usually measured by the number of injuries or fatalities occurring to a group of workers, usually over a period of one year. (Aldrich, 1997).

Accidents at work and occupational diseases are widely seen in all countries to varying degrees. These incidents cause injuries, fatalities and property damage. Accidents and diseases related to working environment have two common characteristics as being primarily man-made and can be prevented to a large extent. Unfortunately, Turkey like most of the developing countries has negative occupational health and safety figures for years due to several complexities. Occupational health and safety constitutes all efforts based on prevention of these accidents and diseases. As a consequence of the dynamic nature of production and work

environment, occupational health and safety requires up-to-date and inclusive information. (Kutagobilik, 2011). Work health and safety is important both for workers and the employers. Obviously workers' lives and futures are at risk at the workplace. Work health and safety has emerged as a result of a necessity to protect workers from dangers and threats caused by the industrialisation, especially the ones that risk their lives, physical formation and health. It is because work injuries and occupational diseases cause danger of deprivation or reduction in their income or lead to their lay off (Bacak et al., 2011).

Chapter 2. Turkish Construction Industry – A Review

The contribution of construction industry to the general economy of country is very considerable. Construction sector has always been one of the key and locomotive sectors of the Turkish economy. According to the first quarter figures of 2011 the construction industry in Turkey has a share of 5.9 % of the Gross National Product (GNP). When the direct and indirect impacts on other sectors is considered the construction sector's share in the Turkish economy is around 30 % (İNTES, 2012). According to İNTES (2018) the employment figures are shown in Table 1 below.

Table 1. Construction Employment in periods 2005 – 2017 in Turkey. (İNTES, 2018)

Year	Construction Sector/person
2005	1.171.000
2006	1.189.000
2007	1.224.000
2008	1.125.000
2009	1.297.000
2010	1.442.000
2011	1.512.000
2012	1.647.000
2013	1.753.000
2014	1.829.000
2015	1.878.000
2016	1.836.000
2017	2.057.000

The distribution of employments in construction sector for persons between 15-64 years according to their education is shown in Table 2.

Table 2. The distribution of employments in construction sector

Description	Employed Persons (1000)	Ratio (%)
Illiterate	30	1.44
Literate without graduation from a school	89	4.28
Primary School	772	37.13
Secondary School	317	15.25
Vocational Secondary School	291	14.00
General Lycee	165	7.94
Vocational Lycee	190	9.14
Higher Education	225	10.82

Turkish contractors in the period 1972 – 2017 in 119 countries have undersigned 9.252 construction contracts for a value of 354,6 billion USD. Table 3 show the total and average project values for Turkish Contractors’ projects in 2001-2017 periods. With this size, Turkey has become one of the important players in the world in overseas contracting services.

Table 3. Project values of Turkish construction companies abroad in 2001-2017 period (İNTEŞ, 2018)

Year	Number of projects	Total project value (\$)	Average project value (\$)
2001	169	2.927.272.050	17.321.136
2002	207	4.491.234.346	21.696.784
2003	337	6.240.609.988	18.518.131
2004	475	8.630.834.610	18.170.178
2005	452	12.978.472.136	28.713.434
2006	574	22.079.142.361	38.465.405
2007	615	25.039.971.457	40.715.401
2008	656	23.995.417.571	36.578.380
2009	511	20.334.308.971	39.793.168
2010	631	23.367.247.330	37.032.088
2011	561	23.915.301.304	42.629.771
2012	545	30.073.223.340	55.182.083
2013	428	29.890.222.255	69.836.968
2014	345	26.856.659.319	77.845.389

Year	Number of projects	Total project value (\$)	Average project value (\$)
2015	265	23.162.952.814	87.407.369
2016	190	13.577.339.410	71.459.681
2017	241	14.666.729.498	76.916.578

As of 2016, in the Turkish Overseas Contracting Services World Scale, there were 46 Turkish companies among the top 250 contracting companies in the world. Accordingly, Turkey has taken place after 2 next China.

According to the Engineering News Record (ENR) Turkey are in the second place with 46 construction companies among the top 250 companies internationally. China with 65 firms is holding the first place. From US 43 firms took place in the list.

In the last three years, the turnover of the first 250 firms operating in the world contracting services faced shrinkage compared to the previous year. In the year 2016, the revenues decreased by 6.4% to 468 billion 12 million dollars.

The total turnover of our 46 companies in the ENR List has been 25,591 million, while the market share is the last three years increasing by %5,5. The total market share of Turkish companies in 2013

While it was 3.8%, it was 4.3% in 2014 and 4.6% in 2015.

Chapter 3. Main Characteristics of the Turkish Construction Sector

The size of the construction firms

Construction sector in general is consisted of Small and Medium Enterprises (SME)s. This is a similar situation both in European Union (EU) and Turkey. The size of the firms has a great effect on the organizational structures and health and safety management system of the companies. According to İNTES (2007) there are nearly 200 thousand construction companies in Turkey and 97% of this figure is SMEs. These firms are considered the lower – quality domestic only set of firms. The other set of firms which is around 200 are considered to be higher quality domestic firms which construct the 70% of the domestic construction investments. The importance of micro and small sized enterprises in Turkey's economy has been accepted since establishing of Turkish Republic (Kuzgun, 2011). Micro and small enterprises have important place in terms of number of business, number of employees and value

added they created. So, it has been accepted one of the basic characteristics of the economic structure in Turkey (Bulutay, 1995:65).

Construction Projects

As known the construction sector is a projects based industry. As it is in many countries the construction industry in Turkey too is in direct relation with goods and services within the economy and is known to a labour intensive sector. Turkish construction industry is depending mainly on the domestic capital and yet the foreign investments in construction sector are not at the desired level. This is mainly due to lack of legislation regarding PPP (Public Private Partnerships) Procurement Model. Although there are Laws regarding BOT (Build Operate Transfer) Model (Law No. 3096/1994, 3996/1994, 4047/1994, 4180/1996, 4283/1997, 4493/1999) Turkey did not get the desired benefit from BOT projects. Since the construction sector is accelerating more than 200 sub-sectors in the economy it is called as a “locomotive sector” and since it is a source for creating many jobs it is defined as a “sponge sector” in Turkey. Turkish construction is composed of housing, other building than housing and civil engineering works (sub structures). Housing investments make 60%, other buildings (non housing) 20% and infra-structures 20% of all construction investments in Turkey. (Turkish Construction Industry Report (YEM), 2010 and İNTES, 2007)

Public versus Private Investments

Public and private investments trigger each other and stimulate for investments in the sector. Usually the public sector investments in construction sector are quantified to be approximately 40% of all construction investments in Turkey (Turkish Construction Industry Report (YEM), 2007)

Workmanship

Employment pattern in the Turkish construction sector is mainly young, male and on temporary basis. It is a labour-intensive sector. Especially for unskilled employees the construction sector is a wide employment area. The women employed in the industry are 36.000 which is only 1% of the employment in construction. According to The Turkish Construction Employers’ Association (INTES, 2008) it is desperately

need of skilled workforce in the industry due to the earthquake reality, mobilization of workforce and high accident rates in construction.

Easy Entrance to the Construction Sector

In order to run a consultancy in construction activity in Turkey it is required a relevant university degree and membership to an Engineering Society. But in order to run a contracting activity the requirements are almost none and very easily one can establish a construction firm and enter into the industry. This situation creates a real danger for the whole economy and safety in general. It is absolutely necessary to establish minimum entry requirements and standards for the construction sector.

The Role of Government

The government is responsible for the legislation and execution in a country. In executing these powers and being the greatest employer and investor in construction has the possibility to use the construction industry as one of the regulators of the economy. They usually act in that direction. Indirectly they control the private sector demand by manipulating the interest rates. Furthermore, the government can regulate the demand through construction permits and construction regulations.

Chapter 4. A Short Review of Historical Developments of Health and Safety: USA, UK and Turkey

USA

The first important step in legalization of the health and safety is taken in 1867 in Massachusetts in the United States. The legal arrangements covered the inspection of factories, statistical data preparation for the workers and enforcement of 10 hours working days. In the following years other states in the US made similar legal arrangements for health and safety issues. The “Pittsburg Study” is realized in the period 1907-1908 in Allegheny and recorded the deaths occurred due to the occupational accidents. Occupational health and safety legal arrangements continued until the first half of the 20th century and 48 states started to apply the laws of worker insurance at the end of 1948 (Uşmen, 1994). In the 1960s however economic expansion again led to rising injury rates and the resulting political pressures led Congress to establish the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration in 1970. The continuing problem of

mine explosions also led to the foundation of the Mine Safety and Health Administration (MSHA) that same year. (Aldrich, 1997).

UK

1802 saw the first piece of Health & Safety Legislation, An Act for the Preservation of the Health and Morals of Apprentices and others employed in cotton mills and other factories, this was passed particularly to safeguard young people in textile mills. This was the first of an enormous amount of legislation designed to protect people at work.

The modern principle in managing Occupational Health and Safety was evolved from the Robens Report in (1972). The Robens Committee was convinced that the primary responsibility for safety at work lies with the people who create and work with the hazards. The Health and Safety at Work Act of 1974 heralded a new approach to health and safety legislation in the U.K. It was intended that this Act together with ancillary regulations made under it should replace all existing health and safety legislation. But, it was accepted that, this would take many years to achieve. Consequently, the Health and Safety at Work Act and associated regulations co-exist with pre-1974 legislation still in force.

The 1974 Health and Safety at Work Act have provided an effective framework for businesses and individuals for almost 40 years. Today UK has the lowest number of non-fatal accidents and the second lowest number of fatal accidents at work in Europe. (Lord Young, 2010).

Despite the success of the Act, the standing of health and safety in the eyes of the public has never been lower, and there is a growing fear among business owners of having to pay out for even the most unreasonable claims (Lord Young, 2010).

Lord Young undertook a Whitehall-wide review of the operation of health and safety laws and the growth of the compensation culture. His report "Common Sense, Common Safety" was published in October 2010.

In "Common Sense, Common Safety", Lord Young put forward a series of recommendations for:

- improving the public perception of health and safety
- ensuring it is taken seriously by employers and the general public
- reducing the burden of bureaucracy on businesses

Lord Young's recommendations were the important first step in the Government's plans for reforming Britain's health and safety system. As the next step, it is published plans, "Good Health and Safety, Good for

Everyone", for further major reform, heralding a new start for health and safety regulation for Britain's businesses. (DWP, 2011a)

There are three key aspects to these further reforms. The Government will:

1. Launch an Occupational Safety and Health Consultants Register to:
 - clamp down on rogue health and safety consultants, and
 - ensure that businesses have access to competent and ethical advice
2. Shift the focus of health and safety enforcement activity away from businesses that do the right thing, and concentrate on
 - higher risk areas, and
 - dealing with serious breaches of health and safety regulations
3. Seek to simplify health and safety legislation and guidance, and in doing so ease the burden on business.

In March 2011, the Government established an Independent Review of Health and Safety legislation to make proposals for simplifying the existing raft of health and safety legislation. This review was chaired by leading risk management specialist Professor Ragnar Löfstedt. The latest health and safety review, Löfstedt's Report of November 2011, recommends that the British Government works more closely with the EU Commission and others, particularly during the planned review of EU health and safety legislation in 2013, to ensure that both new and existing EU health and safety legislation is risk-based and evidence-based. Furthermore, he recommends that Health and Safety Executive (HSE) undertakes a programme of sector-specific regulation consolidations to be completed by April 2015. (The Löfsted Review, 2011).

Turkey

In the field of occupational health and safety, Turkey has legislative, practical and institutional knowledge accumulated over the past 150 years. (ABGS, 2006). In Turkey, applications about OHS date back pre-construction of EU. The first applications about OHS began after Reforms (the political reforms made in the Ottoman State in 1839). The first legal arrangement in this field was "Regulations of Dilaver Pasha." It was prepared about workers who worked as a miner in Zonguldak coal mine. (Demir, 2011)

Industry and trade that are concerned with fine arts and crafts had developed a lot till the Industrial Revolution in Ottoman Empire. Craftsmen and artisans was conducted the activity depending on the Organisation of the guild (*Lonca* in Turkish). Like over the world, the

first approaches in Turkey related to occupational health and safety have emerged at the beginning of industrialization. Republican Era is a period providing significant developments in terms of the recognition of Worker protection and labour rights. At the first Economic Congress which was gathered after the announcement of Republic in 1923, a series of decisions were taken on purpose of protecting workers. (Talas,1992) Health and safety issue became one of the important issues in the working life after releasing the 4857 Labour Law in Turkey. (Law No. 4857 Labour Law, 2003). Currently there are all together 36 by-laws available in Turkey after passing the Labour Law No 4857 in the National Assembly.

The latest development in Turkey: The Law on Occupational Health and Safety No. 6331, governing the health and safety standards to be adopted by employers in Turkey, has been published in the Official Gazette No. 28339 dated 30 June 2012. The enforcement of the law will be from 01.01.2013 date.

The aim of Law No. 6331(2012) is to regulate the duties, powers, responsibilities, rights and obligations of employers and employees in order to ensure occupational health and safety in workplaces and to improve existing health and safety conditions. This Law covers all types of employment, work and workplaces that belong to public and private sectors, owners and/or employers of subject workplaces and representatives/agents of such employers, and all employees including apprentices, interns and trainees, regardless of the fields of activity in which they are involved, other than a few explicitly stated exceptions. These exceptions, as stated in Article 2 of Law No. 6331 are as follows:

- (a) Activities of the Turkish Armed Forces, police, gendarmerie and other law enforcement forces, and the Under secretariat of National Intelligence Organization, excluding persons or employees serving at factories, maintenance centres, sewing/ tailoring workshops and similar workplaces,
- (b) Response and intervention activities of disaster control and emergency response units,
- (c) Household services,
- (d) Persons involved in the production of goods and services on their own behalf and account and who do not employ any workers or other employees and
- (e) Education, security and vocational courses provided for convicts and detainees within the scope of rehabilitation.

For the purposes of this Article, the term “employee” includes any and all persons working either in the private sector or in public authorities,

within the scope of Law No. 6331, regardless of their positions under their own organizational laws. Law No. 6331 will replace the relevant provisions of Labour Law No. 4857 and become the general legislation governing occupational health and safety in Turkey. This independent law for occupational health and safety is compliant with 89/391/EEC Framework Directive and related ILO conventions C155, C161.

Chapter 5. Health and Safety in Turkish Construction

Everywhere in the world construction is one of the most hazardous industries. Although the data available for occupational accidents do not accurately reflect the actual numbers due to the nature of the industry and data collection, it is a good reflection of the general picture of the construction industry itself. According to International Labour Organization (ILO), accidents among workers in the construction industry in the developed countries are 3 – 4 times more compared to the workers in other industries. This risk ratio is assumed to be around 6 in the developing countries (ILO, 2004).

The construction industry has 10% of all accidents in all industries in Turkey. Approximately, 32% of these accidents end with death. In Turkey every 6 minutes an accident is happening and in every 6 hours a worker is losing his life. This is really a very sad and unacceptable situation. Turkey, in occupational accidents holds the first place in Europe and third place worldwide.

Turkish Statistical Institute (TurkStat) Research Report on “Occupational Accidents and Work Related Health Problems” (in Turkish) is published on its web site on March 25, 2008 (TurkStat, 2008). According to this report, 50 % of the occupational accidents could be prevented very easily, 48% could be systematically prevented and only 2% of the occupational accidents could not be prevented. This clearly indicates that 98 % of the occupational accidents can be prevented. Furthermore, it is stated that 2.9% of the employed have had an occupational accident in the last 12 months. This ratio for men was 3.6% and for women 1.3%. The share of the men in the total is 86.8%.

According to TurkStat 2004 occupational accidents in the construction industry is determined to be 8,106 accidents. Of those accidents 263 ended up with death and 349 with permanent disability. In 1992 data, the occupational number of accidents in the construction industry is 22,863. The latest figures in this respect are published by the Department of Labour and Social Security of Turkey in 2006. According to those figures

10% of all occupational accidents, 25% of all the permanent disabilities, and 34% of all the fatal accidents were happened in the construction industry. This and the previous figures indicate very clearly that the accident records in the Turkish construction are very high, needing a special attention to be improved immediately (INTES, 2005 and 2007). While on the other hand, a recent study claims that the reduction of fatal accidents in the sector will be parallel to the increase in the United Nations' so called Human Development Index, HDI (Baradan et al, 2018) Due to the workplace accidents very many construction workers lose their lives or became permanent disable creating social and economic problems together with monetary losses. In Table 4 it is shown the accident statistics for the 2001-2013 period based on the Social Security Agency (SGK) of Turkey yearly published statistics (SGK Reports; 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013).

Table 4. Industry Number of work accidents and mortal work accidents in Turkey, year 2001-2013 (SGK, 2014)

Year	Fatal Accidents		Total Accidents	
	Number	Accident Frequency Rates	Number	Accident Frequency Rates
2001	1,008	20.63	72,363	1,481
2002	872	16.96	72,344	1,385
2003	810	14.43	76,668	1,365
2004	841	13.61	83,830	1,356
2005	1,072	15.49	73,928	1,068
2006	1,592	20.36	79,027	1,011
2007	1,043	12.26	80,602	948
2008	865	9.83	72,963	829
2009	1,171	12.97	64,316	712
2010	1,444	14.40	62,903	627
2011	1,700	15.41	69,227	628
2012	744	6.23	74,871	627
2013	1,360	10.89	191,389	1,533

The distribution of workplaces according to the size of workforce while considering number of accidents, number of the deceased due to work

accidents, number of the insured and the deceased rate per 100,000 employees is shown in Table 5.

Table 5. Distribution of Workplaces Regarding Number of Employees, the Insured, Accidents and Fatalities Due to Work Related Accidents and Rate of the Deceased per 100,000 Employees (SGK, 2014)

Number of Employees at Workplace	Number of Workplaces	Number of Accidents	Work Accident Death	Number of Insured	Death Rate per 100 000 Person
1-3	1 046 372	5 513	110	1 674 626	6.6
4-9	387 890	12 226	189	2 225 951	8.5
10-20	133 752	17 491	230	1 784 954	12.9
21-49	78 272	35 241	301	2 348 567	12.8
50-99	18 753	26 947	160	1 291 354	12.4
100-199	9 033	33 337	165	1 242 956	13.3
200-249	1 726	11 235	33	383 301	8.6
250-499	2 913	28 451	63	993 160	6.3
500-999	951	23 471	48	638 796	7.5

Number of Employees at Workplace	Number of Workplaces	Number of Accidents	Work Accident Death	Number of Insured	Death Rate per 100 000 Person
1000+	328	27 454	327	656 457	49.8
TOTAL	1 679 990	221 366	1 626	13 240 122	12.3

A brief outlook on work accidents and the insured “victims” according to working environment for year 2015 is available in Table 6.

Table 6. Breakdown of Work Accidents and Work Accident Deaths by Working Environment in 2015 (SGK, 2015)

Working Environment	Number of Insured Having Work Accident (2015)						Number of Insured Who Died as a Result of Work Accident (2015)					
	M	%	F	%	Total	%	M	%	F	%	Total	%
Industrial Area	101	48.	147	42.	115	48.	17	14.	8	24.	18	14.
	201	91	65	64	966	01	2	11		24	0	38
Construction, Open-air Quarry	284	13.	103	0.3	285	11.	44	36.	0	0.0	44	35.
	85	77		0	88	84	2	26		0	2	30
Public Area	135	6.5	183	5.3	154	6.3	14	11.	6	18.	14	11.
	74	6	7	1	11	8	3	73		18	9	90
Office, Entertainment Area	568	2.7	283	8.1	851	3.5	15	1.2	1	3.0	16	1.2
	1	5	3	8	4	2		3		3		8

Working Environment	Number of Insured Having Work Accident (2015)						Number of Insured Who Died as a Result of Work Accident (2015)					
	M	%	F	%	Total	%	M	%	F	%	Total	%
Underground Location	7682	3.71	5	0.01	7687	3.18	28	2.30	0	0.00	28	2.24
Health Institution	2396	1.16	3614	10.44	6010	2.49	3	0.25	4	12.12	7	0.56
Farming, Forest Area	1132	0.55	370	1.07	1502	0.62	20	1.64	0	0.00	20	1.60
In the Air	355	0.17	825	2.38	1180	0.49	6	0.49	0	0.00	6	0.48
At Home	678	0.33	30	0.09	708	0.29	4	0.33	0	0.00	4	0.32
Above Water	622	0.30	21	0.06	643	0.27	6	0.49	0	0.00	6	0.48
Other	4516	0.39	10222	0.43	55338	0.39	380	0.38	14	0.42	394	0.30
TOTAL	206922	100.00	34625	100.00	241547	100.00	1219	100.00	33	100.00	1252	100.00

Chapter 6. Health and Safety (H & S) and Law

Good health and safety is vital to good business. Sensible and proportionate health and safety regulation can support economic growth by maintaining a healthy and productive workforce. However, to be effective, and to provide genuine protection for workers and the public, regulation needs to be easy to understand, administer and enforce. (DWP, 2011b)

Occupational health and safety may basically be defined as the measures to be taken regarding health problems and vocational risks emerging from the physical environmental conditions that employees, temporary employees, visitors or even customers may encounter during the implementation of the work at a workplace and the ways to prevent or at least minimize, if it is not possible to prevent, such possible problems. In order to get this done is the primary duty of the employers in the working life. This is due to the fact that the source of the dangers for the workers during performing their jobs is a result of the activities within the organization set up by the employer for that particular job. (Akın, 2001). But, since there is a connection between right of life and health and safety as indicated in Article 17 of Turkish Constitution, makes the health and safety issue more than a question for the employers and workers. In a wider social responsibility point of view since Turkey is a social state of law, health and safety issue is a government policy for all the citizens in the country. (Güzel, 2003; Süzek, 2001). Therefore from the health and safety view point there is a three-party legal relation existing between worker, employer and the state (Kabakçı, 2009). Due to its area of concern the health and safety issues can be classified as a mixed area of law covering public law and private law in Turkey (Kabakçı, 2009). 4857 No. Labour Law including the health and safety in its content is a good example to this argument. The legal source of the legal relation between a worker and an employer in a labour agreement is the private law itself in Turkey. The core issue in such an agreement in principle should be the “equality principle” of the parties concerned. Despite this fact, the state almost always intervenes in order to protect the rights of the worker (Süzek, 1985, 2008; Ekonomi, 1984). A worker is performing his duties as a dependent to his employer and therefore the state is forced to intervene because of the social responsibility in relation to occupational health and safety of its citizens. (Narmanlıoğlu, 1998)

According to labour law legislation, employers are obliged to take all necessary measures and make available all equipment required to ensure occupational health and safety at workplaces, whereas employees are obliged to comply with such measures taken for occupational health and safety. In order to ensure compliance with and supervision of the measures taken for occupational health and work safety at the workplace, the employer must (a) keep the employees informed regarding occupational risks they are exposed to and measures to be taken, and (b) inform the employees of their legal rights and obligations and (c) provide training to the employees on issues related to occupational health and

safety. The employee is the weaker party in the employment agreement in working life in general and particularly in construction sector. Therefore, the legislature regulated the relationship between the employer and the employee with imperative provisions, most of which are in favour of the employee, under Labour Law no. 4857 in Turkey. Law of Obligations no. 818 in Turkey also burdens the employer with strict liability which provides that even if the employer fulfils all the necessary requirements regarding occupational health and safety, he/she shall be liable to compensate all possible damages of an employee or third person in case of an occupational accident unless he/she proves that damage would have happened even if all necessary measures were taken. On the other hand, the employer reserves the right of reimbursement from the employee if that is found. Turkish Law of Obligations no. 6098 (“New Law of Obligations”) that is in force since July 1, 2012. It appears from the provisions of the New Law of Obligations regarding employers' liability that the applicable principles remain unchanged.

In a work agreement the employer has a legal liability to “take care” of the worker. This care taking liability includes taking care of employee’s wellbeing, avoiding behaviour to harm the employee and avoiding dangers. The liability of taking care of the employee means, taking all the necessary precautions for occupational safety to avoid danger and harm to the employee. Most important of all in a work situation is the protection liability of the employer which makes the employer liable to protect health and life of the employee. Besides the employer is liable to inform, direct and take all the preventive measures for health and safety issues in a working place. What is objectively necessary to take measures for the safety in a workplace the employer is liable to do so. Shortly, the employers are liable to take all the safety precautions to protect the employees at workplace in accordance both the private law, Law of Obligations No 818 Clause 332, Turkish Law of Obligations No. 6098 and private law mainly Law No.1475 and 4857 Work Law.

In addition to taking all necessary measures to protect employees, employers should also provide training to the employees regarding their legal rights/liabilities and risks which they may encounter at the workplace and possible ways to handle such risks. As per Article 15 of the Regulation on the Procedure and Principles of Employees' Occupational Health and Safety Training (“Çalışanların İş Sağlığı ve Güvenliği Eğitimleri Hakkında Yönetmelik”) (Ministry of Labour and Social Security, 2004) 07.04.2004 Tarihli Resmi Gazete Sayı: 25426

training must be given by qualified instructors such as occupational health and safety engineers, instructors or on-site doctors, depending on the subject of the training. Moreover, the employer may also provide such training from corporations which are authorized to provide occupational health and safety training. For the avoidance of doubt, such outsourcing does not clear the employer of liability.

Chapter 7. Linking Culture and Safety

What is culture?

What is societal culture of Turkey?

What is the relation between culture and safety?

What can be the practical reasoning of the high accident rate in the Turkish construction sector? (See the results of the study)

An acceptable health and safety culture in a construction organisation can only be achieved by the management commitment actively. This is the primary duty of the management before the other management functions. The core idea here is the understanding of the people to be the most important asset of the organisation. Health and safety must be managed with top priority from top-down in all levels of management giving the highest priority to the health and safety of the people they employ. Policy statements on health and safety form part of the safety culture in an organisation. Good information is essential for health and safety culture to be established. Each member of the management team must have well defined health and safety responsibilities and they have to show continually their commitment to this issue.

Safety has to be viewed more than just a statistical expression like a ratio of accidents to employment numbers. Safety involves a specifiable kind of reasoning about reality. To link the two broad areas of research culture and safety is not easy. It is not wise to divide the problem into two broad areas namely, culture of safety and safety problem itself. In this paper it is chosen a holistic approach to capture the qualities of the link between societal culture in Turkey and safety understanding in construction projects.

What is culture? Paşa et al (2001) argues that in general sense culture is defined in terms of a number of shared processes: shared ways of thinking, feeling and reacting; shared meanings and identities; shared socially constructed environments; common ways in which technologies

are used and commonly experienced events including history, language and religion of their members. Hofstede (1980) defines culture as the collective mental programming of the people in an environment, claiming that national culture has the greatest impact on organisational behaviour. According to Schein (1992) and Triandis (1972) culture is the norms, roles, belief systems, laws and values that form meaningful ways. In order to understand the relation between culture and safety it is needed to understand the societal culture of Turkey.

According to Hofstede (1980), Turkish culture has long been described as being high on collectivism and power distance. According to Schwartz (1994) in culture level value dimensions in a survey of 34 cultures, Turkey ranked above the average in values of conservatism (12th) hierarchy (5th), egalitarian commitment (13th), and harmony (16th). In their seven countries study of paternalism as one of the four socio-cultural dimensions of societies Kanungo and Aycan (1997) found Turkey to carry paternalistic values. Findings of the GLOBE study revealed two predominant characteristics of Turkey to be in group collectivism and power distance (Kabasakal & Bodur, 1998). The same researchers state that Turkey is below average on gender egalitarianism (56th), uncertainty avoidance (49th), performance orientation (45th), societal collectivism (42nd), humane orientation (37th) and future orientation (36th). According to the same writers, Turkey is higher in terms of in-group collectivism (4th), power distance (10th) and assertiveness (12th). Turkish organizations are distinguished by centralised decision making, highly personalised, strong leadership and limited delegation (Ronen, 1986). Furthermore, Trompenaars and Hampden-Turner (1998) found Turkey to have the steepest hierarchy in its organisation, indicating the sub-ordination of employees to their leaders. Besides, Turkish organisations are also described to be of the family-type (Trompenaars & Hampden-Turner, 1998) and Turkish leaders are characterised by paternalistic attributes in that Turkish managers and leaders show paternal consideration towards their sub-ordinates (Kanungo & Aycan, 1997; Paşa, 1999). Mearns and Yule (2009) argue that Hofstede's dimensions of national culture are applicable to the study of safety climate and safety related behaviour in a multinational construction management company, particularly emphasizing that the differences in national culture may have a profound influence on the validity of transferring safety procedures and work methods from one country to another. Besides they argue that when Hofstede's dimensions are applied to the working environment there are

possibilities that they will have a varying impact of the safety performance of its members.

Paşa et al (2001) state that organisational structure can be regarded as a framework for decision making and the decision implementation processes and understanding of structure requires also reference to the relationships, processes and actions that lie behind the dimensions of centralisation, specialisation and formalisation. According to Tayeb (1994), the above mentioned relationships and processes are power and authority relationships, coping with uncertainty and risk-taking, interpersonal trust, loyalty and commitment, motivation, control and discipline, coordination and integration, communication, consultation and participation. Schein (1992) emphasizes that any group with a stable membership and shared learning in an organization can develop work related values and attitudes, so-called the organisational culture. Construction is a project-based industry. Construction projects are one-off and are composed of and managed by temporary organisations. Its temporary nature and rapid adaptation to new situations and continuously changing construction environments with a temporary organisational structure makes construction sites to be dangerous prone working places. The team members in temporary organisations are more prone to their own aims rather than the common project goals in understanding the scope of the project and the work to be done. This understanding and goal setting of the team members in such a project environment is the basic reason of high frequency accident rates and other project based problems in construction sites. As the project progresses the structure of the temporary organisations change with the new workforce to the site and this situation is defined by Cyert and March (1963) as “changing multi-goaled loosely-knitted coalition” structure.

Cultural norms and behaviours play a large part in the interpersonal relationships at work. Behavioural norms are taken in a culture people grow up. In different cultures behaviours (reactions, feelings, and responses) are also different. Hofstede's Cultural Dimensions can be used as a reference, to evaluate workers approach, decisions and reactions to certain issues in a work situation. It is obvious that even in a certain country itself there will be deviations from the Hofstede's norms making the construction sites heterogeneous working places. There is no commonly accepted cultural model to be applied to all construction sites in a specific country. Each construction site will have its own project culture to be identified and formulated in order to develop a work-based behavioural safety framework.

Behavioural safety is a process that creates a safety partnering between project management and the workforce by focusing everyone's safety behaviour. It typically involves creating a systematic, ongoing process that clearly defines a finite set of behaviours that reduce the risk of injury within an organization, collects data on the frequency and consistency of those behaviours, and then ensures feedback and reinforcement to ensure support of those behaviours (Langford et al., 2000). The safety of the workplace is influenced by a number of factors such as the organizational environment, management attitude and commitment, the nature of the job or task, and the personal attributes of the individual (Rowlinson, 1997; Mullen, 2004; Aksorn and Hadikusumo, 2008). Safety related behaviour at the workplace can be modified by addressing these major influences. The successful introduction of a behavioural safety process, focusing on identifying and reducing unsafe behaviour, is one means of improving safety performance.

Chapter 8. Research Methodology and Response Rate

The methodology applied in this research is qualitative research. Qualitative research means “any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification (Strauss and Corbin, 1990, p.17) and instead, “the kind of research that produces findings derived from real world settings where the phenomenon of interest unfold naturally” (Patton, 2001, p.39).

Qualitative research uses a naturalistic approach that seeks to understand phenomena in context specific settings, such as “real world setting where the researcher does not attempt to manipulate the phenomenon of interest” (Patton, 2001, p.39). Strauss and Corbin (1990, p.19) identify the tasks of qualitative research as “to uncover and understand what lies behind any phenomenon about which little is yet known” or “to gain novel and fresh slants on things about which quite a bit is already known”.

Miles and Huberman (1994) suggest the following features of qualitative research:

- Conducted through an intense and/or prolonged contact with a ‘field’ or life situation (typically ‘normal’ situations, reflective of everyday life of, for example, project organisations);
- Researcher’s role is to gain a holistic overview of the context under study;
- Researcher attempts to capture data on the perceptions of local actors ‘from the inside’;

- Main task: explicate the ways for managing day-to-day situations;
- Many possible interpretations of material;
- Little standardised instrumentation is used at the outset; most analysis is done with words.

Miles and Huberman focus on qualitative data in the form of words.

According to Stenbacka (Stenbacka, 2001, p.551 cited in Golafshani (2003)) the quality concept in qualitative study has the purpose of understanding. Stenbacka, (ibid) noted that “the concept of reliability is misleading in qualitative research. If a qualitative study is discussed as a criterion, the consequence is rather that the study is no good”. But, Patton (2001) stated that validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analyzing results and judging the quality of the study. This corresponds to the question that “How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to? (Lincoln & Guba,1985, p.290). To answer this question, Healy and Perry (2000) assert that the quality of a study in each paradigm should be judged by its own paradigm’s terms. In qualitative research paradigms the terms Credibility, Neutrality or Conformability, Consistency or Dependability and Applicability or Transferability are to be the essential criteria for quality (Lincoln & Guba, 1985).

This research uses construction projects as the unit of analysis. All together 50 medium sized construction companies in Sakarya and Kocaeli counties in Marmara Region in Turkey were sent the questionnaire and 27 returned satisfactorily completed (54 % response rate). The response rate of 20.9 percent is not uncommon and acceptable and is in line with the opinions of Akintoye (2000) and Dulami *et al* (2003). They reported that the norm response rate in the construction industry for postal questionnaire is around 20-30 percent. Ofori and Chan (2001) received a 26 percent response rate. Vidogah and Ndekugri (1998) received a 27 percent response rate and Shash (1993) a 28.3 percent rate.

The research is a first stage of a greater scale research covering three different regions; Marmara, Aegean and Central Anatolia. This study also constitutes the recent version of a study conducted by Dikmen et al (2010, 2011) in a seemingly smaller geography, i.e. Istanbul. Also, it is worth to note that Dikmen et al’s study was after the issuance of Law no 4857, but before the acceptance of Law no. 6331 by the Turkish Parliament.

The questionnaire has been developed for the construction industry in general. Various questions measured different aspects of the construction

safety. The questionnaire survey was consisted of 80 questions and was designed to map the safety understanding and management in construction projects. Questionnaires were sent to Project/site managers and safety inspectors who were directly responsible of safety of the sites. A questionnaire survey is one of the most cost effective ways to involve a large number of people in the process in order to achieve better results, as recommended by Andi and Minato, (2003).

Chapter 9. Results of the Survey and conclusion

The results of the survey conducted is demonstrated in Tables 6 through 20. Though tabulated the results indicate a certain degree of compliance to the law, it is not at a satisfactory level. A comparison of results with that of the Dikmen et al's findings for the Istanbul had revealed that not much progress made in the meantime. Furthermore, when the results are evaluated under the light of Table 3 it can be stated that the targeted outcome is not yet achieved. Furthermore, Hence, parallel to this finding it can be concluded that only the issuance of laws and regulations may not be sufficient for the achievement of satisfactory results in OHS.

Table 7. Distribution of the project types surveyed

Project Type	No of companies	Percent distribution
Single building	5	18.5
Mess housing	4	14.8
Industrial structure	6	22.2
other	12	44.4
Total	27	100.0

Table 8. Distribution of the contract types of the projects surveyed

Contract Type	No of companies	Percent distribution
Bid-Build	18	66.7
Agent-Owner	5	18.5
BOT	2	7.4
Self-investment	2	7.4
Total	27	100.0

Table 9. The entity supervising the quality of the project

Supervisor	No of companies	Percent distribution
Self	13	48.1
Supervising company	8	29.6
Consultant firm	6	22.2
Total	27	100.0

Table 10. The ISO certificate ownership of the participating companies

ISO Certificate		No of companies	Percent distribution
ISO 9000	Yes	18	55.6
	No	9	44.4
ISO 14000	Yes	14	33.3
	No	13	66.7
ISO 18000	Yes	8	27.8
	No	19	72.2

Table 11. Existence of an OHS committee per code no. 4857

	No of companies	Percent distribution
Yes	17	63
No	10	37
Total	27	100

Table 12. Position of the head of the OHS committee in the project

Position in the project	No of companies	Percent distribution
Owner's representative	10	37.0
Human resources mngr.	2	7.4
Foreman, skilled labor	1	3.7
Workers' representative	1	3.7
Other	3	11.1
Total	27	100.0

Table 13. Frequency of the OHS committee's meetings

Frequency	No of companies	Percent distribution
Once a month	15	55.6
Seldom	2	7.4
Total	27	100.0

Table 14. Attendance to external OHS training sessions

Highest rank	No of companies	Percent distribution
Project manager	6	35.3
Site manager	1	5.9
Engineer	10	58.9
Total	17	100.0
Lowest rank	No of companies	Percent distribution
Project manager	2	11.8
Engineer	8	47.0
Labourer	7	42.2
Total	17	100.0

Table 15. Frequency of internal OHS training sessions

Frequency	No of companies	Percent distribution
None	1	5.8
Seldom	10	58.9
Monthly	4	23.6
Bi-weekly	2	11.7
Total	17	100.0

Table 16. Frequency of internal OHS inspection

Frequency	No of companies	Percent distribution
None	7	26
Seldom	5	19
Bi-weekly	3	11
Weekly	12	44
Total	27	100.0

Table 17. Penalties for non-compliance of OHS rules

Penalties	No of companies	Percent distribution
Warning	12	44
Fines	2	7
Termination of job	4	15
All of the above	2	7
None of the above	7	26
Total	27	100.0

Table 18. supply of OHS gear

	No of companies	Percent distribution
Only to company employees	15	56
To subcontractors' w/o cost	6	22
To subcontractors at cost	6	22
Total	27	100.0

Table 19. Inspection of site by official entities

Reason for inspection	No. of companies	Percent distribution
After an accident	8	30
Routine inspection	19	70
Total	27	100.0

Table 20. Motivation for having an OHS system

	No. of companies	Percent distribution
Ethical reasons	19	70
Legal reasons	4	15
Other	4	15
Total	27	100.0

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