



**T.C.  
YEDİTEPE UNIVERSITY  
GRADUATE INSTITUTE OF SOCIAL SCIENCES**

**THE RELATIONS BETWEEN BOTH EMPLOYEES' AND  
MANAGERS' PERCEPTIONS OF SAFETY CLIMATE,  
AS WELL AS  
WORK RELATED EMPLOYEE ATTITUDES**

**by**

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## **ABSTRACT**

The purpose of this research is to examine organizational and managerial nature of industrial accidents by explaining the relations between employees' and managers' perceptions of safety climate (SC), as well as work related employee attitudes such as organizational commitment (OC) and job satisfaction (JS) in shipbuilding sector.

The research sample consists of 249 employees and managers from five shipyards, one in Kocaeli and four in Tuzla (İstanbul) and employed by shipyard owner or subcontractor.

The research findings indicate no difference in the perception of SC, OC, and JS as a whole between employees and managers. However, when the dimensions of SC, OC, and JS are considered separately, the findings show some differences: employees feel more independent than managers to refuse to work if they feel the task is unsafe and perceive the likelihood of injuries less than that of managers (SC); employees care about the fate of the organization less than that of managers (OC); and employees do not think that their managers really care their ideas about the job as much as their managers do (JS). Further, SC, OC, and JS are positively correlated with each other and some elements of SC explain majority of the variance in the dependent variables of OC and JS.

## ÖZET

Bu araştırmanın amacı, gemi inşa sektöründeki çalışanların ve yöneticilerin, iş yeri güvenlik iklimini ve işle ilgili çalışan tutumlarından örgütsel bağlılığı ve iş memnuniyetini algılamaları arasındaki ilişkiyi açıklayarak, endüstriyel kazaların örgütsel ve yönetsel doğasını incelemektir.

Araştırma modeli, biri Kocaeli'nde, dördü Tuzla (İstanbul)'da bulunan beş tersanedeki, tersane veya taşeron firma tarafından istihdam edilen, 249 çalışandan ve yöneticiden oluşmaktadır.

Araştırma bulguları, çalışanlar ve yöneticiler arasında, güvenlik ikliminin, örgütsel bağlılığın ve iş memnuniyetinin algılanması arasında, bütün olarak, bir fark olmadığını göstermektedir. Bununla birlikte, güvenlik ikliminin, örgütsel bağlılığın ve iş memnuniyetinin boyutları ayrı ayrı değerlendirildiğinde, bulgular bazı farklar olduğunu göstermektedir: çalışanlar, verilen görevin güvensiz olduğunu hissedersen, çalışmayı reddetme açısından, kendilerini yöneticilerden daha özgür hissediyorlar ve yaralanma olma olasılığını, yöneticilere göre, daha az buluyorlar (güvenlik iklimi); çalışanlar, organizasyonun geleceğini yöneticilerden daha az önemsiyorlar (örgütsel bağlılık); ve çalışanlar, işle ilgili fikirlerinin müdürleri tarafından, yöneticilerin kendi müdürleri hakkında düşündüğü kadar, dikkate alındığını düşünmüyorlar (iş memnuniyeti). Ayrıca, güvenlik iklimi, örgütsel bağlılık ve iş memnuniyeti arasında pozitif bir korelasyon vardır ve güvenlik ikliminin bazı elemanları, örgütsel bağlılığı ve iş memnuniyetini büyük oranda açıklamaktadır.

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To My Brother, Mother, and Father.

## **1. INTRODUCTION**

Especially within the last two decades, the senior managements of organizations have widely agreed on the importance of the implementation of a wide range of safety measures such as Occupational Health and Safety Management Systems. The aim of the safety management systems is to create and maintain a safe working environment by minimizing risks to its employees, other interested parties, and company as a whole.

The importance of the safety management has increased sharply because of the unpleasant consequences of inefficient safety management. Inefficient safety management results in accidents and injuries causing not only moral losses but also economical losses mostly in manufacturing and construction sectors all over the world.

According to International Labour Organization (ILO, 2008), over 1.2 million women and men lose their lives every year due to occupational injuries and diseases. Moreover, 250 million people incur hazards resulting from occupational injuries and 160 million people incur hazards resulting from occupational diseases every year (European Agency for Safety and Health at Work, 2007). Therefore, safety in different economic sectors poses a serious problem which deserves attention not only from the perspective of safety measures, but also from the organizational viewpoint to create awareness on the subject.

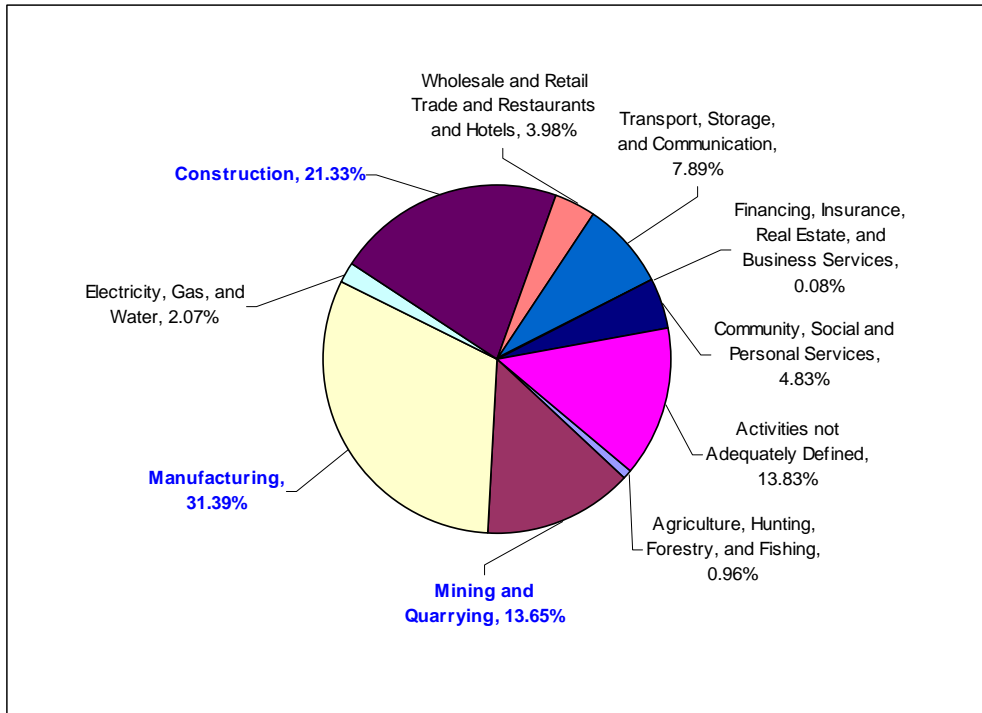
As a matter of fact, the rate of industrial accidents is important in Turkey as well. In terms of the statistics of Turkish Social Insurance Institution, 79,027 occupational injuries and 574 occupational diseases occurred in 2006 and 1,601 of them resulted in death; lost work

days due to occupational injuries and diseases are 1,895,235 days. Besides these statistics, there are still not reported occupational accidents and diseases since there are still lots of uninsured workers in Turkey (European Agency for Safety and Health at Work, 2007).

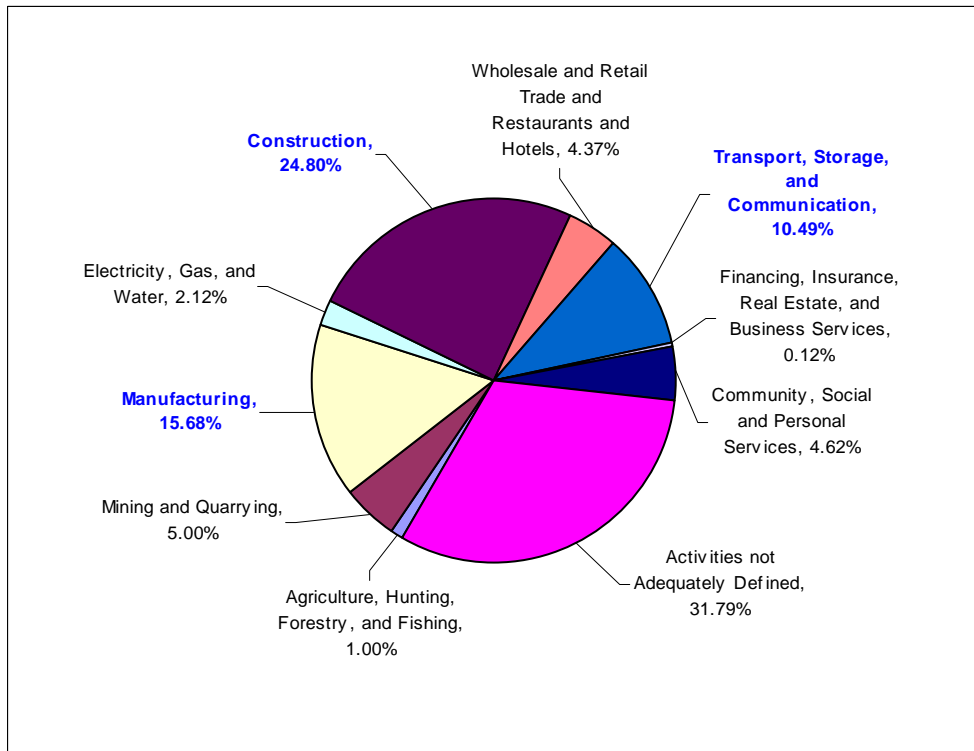
Organizational nature of safety management is actually a new one and to my knowledge, no empirical research was conducted by organizational behaviourists in order to understand the level of knowledge of both heavy workers and their managers on the subject of safety management and its relation with work related employee attitudes in Turkey. As a result of increased level of importance, some new terminology was added into the field of organizational behaviour such as safety management, organizational safety culture and climate, occupational health and safety management (Zohar, 1980, 2002; Frenkel, Priest, & Ashford, 1980; Walters & Haines, 1988; Hurst, Young, Donald, Gibson, & Muyselaar, 1996; Cox, Tomas, Cheyne, & Oliver, 1998; Mearns & Flin, 1999; Guldenmund, 2000; Clarke, 2002; Mearns, Whitaker, & Flin, 2003).

Because one of the industries in Turkey, where the work related accidents and injuries are mostly seen, is manufacturing industry (shown in Fig. 1.1) and more importantly, the rate of the accidents resulted in death is relatively very high in manufacturing industry (shown in Fig. 1.2), the manufacturing sector was chosen to study. This research was conducted on Turkish employees and managers working in the shipbuilding sector.

Especially within the last decade, the results of insufficient safety management in shipbuilding sector in Turkey got worse as the demand for various types of ships has increased sharply. According to GİSBİR (Turkish Ship Builders' Association)'s research



**Figure 1.1.** Occupational Injuries in Turkey – Total (Fatal and Non-Fatal) Cases by Economic Activity from Social Insurance Institution in 2006 (Resource: ILO)



**Figure 1.2.** Occupational Injuries in Turkey – Fatal Cases by Economic Activity from Social Insurance Institution in 2006 (Resource: ILO)

involving occupational accidents in Turkish shipyards, approximately, 18,500 accidents have occurred for the last 18 months in the shipyards and 34 workers, on average, have been injured or lost their lives in the shipyards every day (Sol Political Newspaper, 2007).

For the mentioned reasons, it was decided to undertake this study in order to assess the current safety culture, as well as work related attitudes among Turkish shipbuilding companies.

### **1.1. Purpose of the Study**

The purpose of the research is to examine organizational and managerial nature of industrial accidents by explaining the relations between employees' and managers' perceptions of safety climate, as well as work related employee attitudes such as job satisfaction and organizational commitment in shipbuilding sector and comparing the outcomes of the study conducted. The sub-research problem is related to understanding the magnitude of management commitment and employee involvement as safety climate dimensions in terms of both the assessment and the application of safety policy.

### **1.2. Significance of the Study**

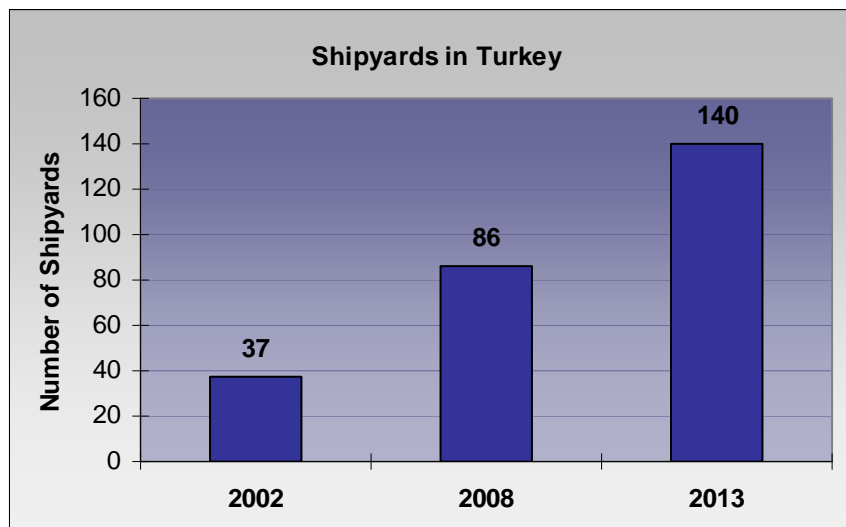
Due to the limited number of empirical studies on safety management in shipbuilding sector both at abroad and in Turkey, it is obvious that there is a need to study the subject of safety management concerning occupational accidents and injuries from organizational perspective.

The concepts of safety culture and climate, which are being used interchangeably in the relevant literature, refer to workers' attitudes towards safety (Clarke, 2006). The concept of safety implies the magnitude of risk involved in the course of work processes particularly in certain industries such as construction, manufacturing, natural gas and oil exploration and production, and aviation. The term of risk is of extreme importance in safety management, yet "the qualities of risk are not universal and absolute, but have different meanings to different social groups" (Holmes, Gifford, & Triggs, 1998). Similarly, the concepts of safety culture and climate, as well as occupational health and safety have not yet been clearly defined among scholars. Furthermore, the managers of organizations do not pay utmost attention to the safety measures of their workers and more importantly, they may not be aware of the fact that the association between employees' safety perceptions and their work related attitudes is directly linked to the overall performance of companies. Since the overall efficiency of organizations depends on the quality of employee's affective attitudes, some of them will be considered in this study, namely, job satisfaction and organizational commitment.

## 2. SHIPBUILDING SECTOR IN THE WORLD AND TÜRKİYE

As the shipbuilding sector has become a rising trend in all over the world, the contribution of Turkish shipyards to the sector has also increased in terms of production with competitive quality and capacity and in relation to this development, employment has also increased significantly. Unfortunately, required regulations have not set at the proper time and the occupational health and safety measures have not been taken sufficiently to meet the requirements of increasing employment at the shipyards.

According to the “Shipyards and Fact of Tuzla” Report prepared by Turkish Ministry of Labour and Social Security (TMLSS) in June 2008, the Turkish shipyards worked approximately with only 15 percent capacity from 1982 to 2000; however, they have increased their production enormously since the demand boom took place in 2002.



**Figure 2.1.** Number of Shipyards in Turkey (TMLSS, 2008)

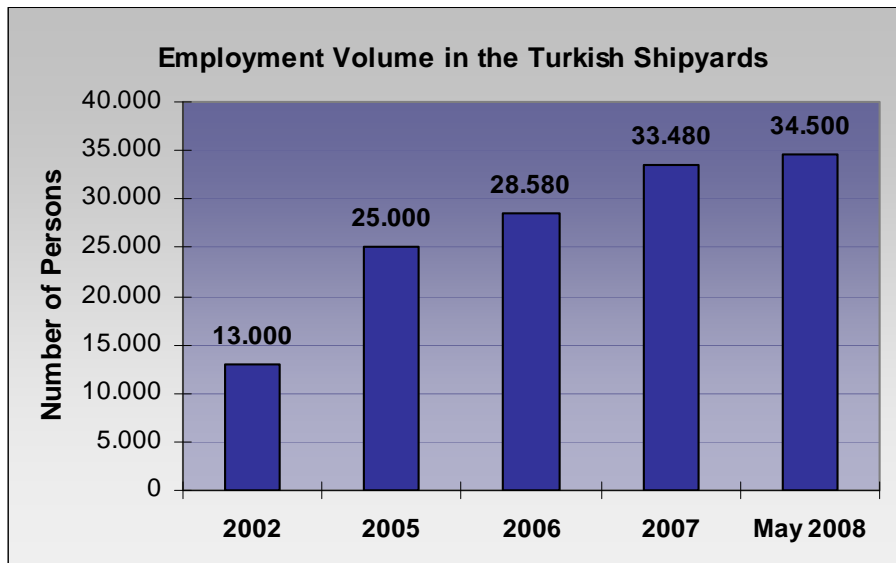
As the world shipbuilding sector has showed 89 percent growth since 2003, the growth rate in Turkey has been 360 percent according to the same report of TMLSS. Figure 2.1 shows the number of shipyards in Turkey in 2002, 2008, and 2013.

**Table 2.1.** Active Shipyards in Turkey (TMLSS, 2008)

<b>PROVIDENCE</b>	<b>NUMBER</b>
<b>İstanbul</b>	<b>46</b>
<b>Yalova</b>	<b>9</b>
Zonguldak	9
Trabzon	8
<b>İzmit</b>	<b>7</b>
<b>Çanakkale</b>	<b>2</b>
Ordu	1
Samsun	1
Kastamonu	1
Hatay	1
Sakarya	1
<b>TOTAL</b>	<b>86</b>

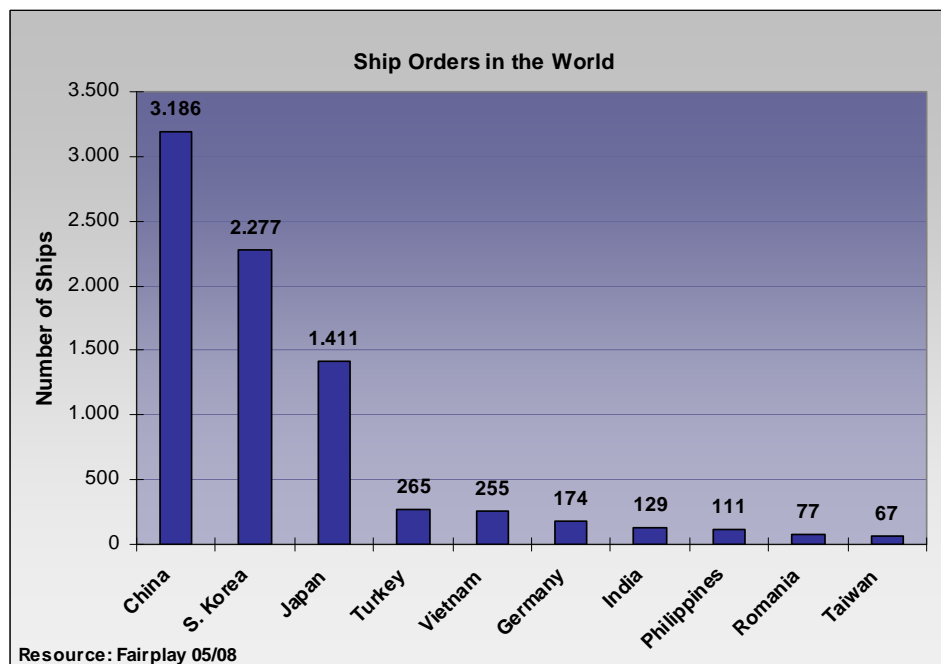
Table 2.1 shows the number of active shipyards in terms of providences in Turkey. This distribution shows that 64 of 86 shipyards are working actively in the Marmara Region, and İstanbul with 46 active shipyards is the most intensively working area in the shipbuilding sector.

The employment capacity in shipbuilding industry has increased sharply since 2003 as a result of the increasing production due to the demand boom in 2002. Figure 2.2 shows the employment volume in the shipyards between 2002 and May 2008.



**Figure 2.2.** Employment Volume at the Shipyards in Turkey (TMLSS, 2008)

China was in the first rank in the world shipbuilding ranking, and South Korea and Japan were following it respectively in 2008 (shown in Fig.2.3). As for the Turkish shipyards, they were 23<sup>rd</sup> in the world ranking in terms of production in 2002 and their position in the ranking increased to 4<sup>th</sup> rank in 2007.



**Figure 2.3.** Allocation of Ship Orders in the World (TMLSS, 2008)

The production rate in terms of deadweight (DWT) of vessels, which expresses the carrying capacity of the vessels, increased about 7.6 times between 2000 and 2007 as it is seen in the Table 2.2. In May 2008, 195 vessels having totally 1,450,000 DWT were being produced at the shipyards in Turkey and definite orders of 267 vessels having totally 3,420,000 DWT were taken according to the report of TMLSS.

**Table 2.2.** Vessel Production in Terms of Number and DWT in Turkey (TMLSS, 2008)

YEAR	NUMBER	DWT
2000	17	88,500
2001	39	147,130
2002	38	136,954
2003	44	255,502
2004	59	189,754
2005	78	330,602
2006	100	556,285
2007	98	670,000

## 2.1. Tuzla Shipyards Region

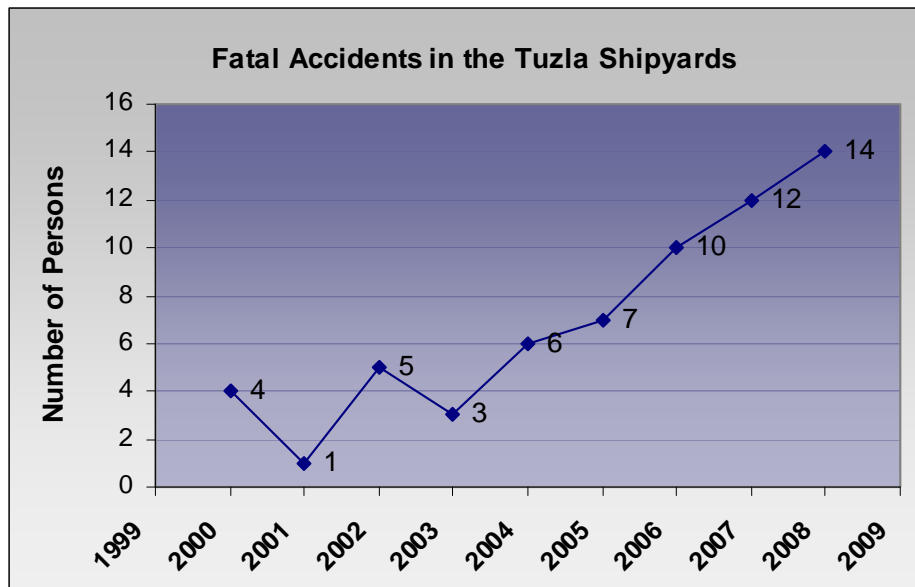
As the shipbuilding sector has become one of the fastest growing sectors of Turkey since 2002, Tuzla Shipyards Region (see Figure A.1 in Appendix A) have become the locomotive of the sector. Because the number and capacity of the shipyards are the highest in Tuzla, the rate of the accidents and injuries occurred mostly here and the region has come into prominence among others.

Table 2.3 and Figure 2.4 shows the fatal accidents happened in the Tuzla Shipyards Region and reported to TMLSS. As it is seen clearly, the rate of accidents resulted in death has started to increase sharply in 2003.

**Table 2.3.** Fatal Accidents in the Tuzla Region Reported to TMLSS (TMLSS, 2008)

YEAR	NUMBER OF FATAL ACCIDENTS
2000	4
2001	1
2002	5
2003	3
2004	6
2005	7
2006	10
2007	12
2008	14
2009*	7
<b>TOTAL</b>	<b>69</b>

\*Data given for the first 6 months of 2009 and obtained from Limter-İş Labour Union.



**Figure 2.4.** Fatal Accidents in the Tuzla Shipyards (TMLSS, 2008)

The Turkish Ministry of Labour and Social Security established a commission to investigate the reasons of the accidents in Tuzla Region. The report of TMLSS spread in June 2008 says that:

- There are 46 shipyards working in the Tuzla Region.
- There were 563 subcontractors in February 2008 and 480 subcontractors in June 2008 changing in terms of the work situation; however, there were no subcontractors before 2002.
- 23,680 workers were employed by contractors (shipyards) and subcontractors working in the region. As 5,180 of them were working directly for the contractors, 18,500 of them were working for the subcontractors.
- Most of the shipyards had orders till 2012.
- The work at the shipyards with the supplier industry is six times more labor-intensive than that of the other sectors.
- As of June 2008, at least ten engineers were employed in every shipyard, but before 2002, the total number of engineers in the region was just ten.
- As 46 shipyards were located over 979,122 m<sup>2</sup> outdoor area and 300,592 m<sup>2</sup> indoor area (1,279,714 m<sup>2</sup> in total), and the minimum working area was 2,126 m<sup>2</sup> and the maximum working area was 196,376 m<sup>2</sup> in Tuzla Region, the total area in which only one shipyard were located over was 500,000 m<sup>2</sup> in South Korea which was the 3<sup>rd</sup> in the world ranking.

All the information given above shows the heavy working conditions at the shipyards as a result of demand boom.

As a result of the inspections conducted by TMLSS in Tuzla for five months which ended at the end of February 2008, the main reasons behind the current problems were determined as follows:

- Lack of space (narrow working areas) at shipyards,
- Overworking,
- Insufficient occupational health and safety measures (see Figure A.2, A.3, and A.4 in Appendix A),
- Unregistered employment,
- Problems in subcontracting system,
- Insufficient vocational education of workers,
- Lack of culture of protection (see Figure A.5 in Appendix A).

### 3. KEY CONCEPTS OF THE RESARECH

#### 3.1. Safety Climate/Culture

The efficiency of safety management is directly related to the safety climate/culture of the organization. Health and Safety Commission (1993) in the UK recommends that companies can prevent accidents and maintain a good safety record through the development of a positive safety culture (Clarke, 2006). An organization's safety culture is related to the core assumptions and beliefs that organizational members hold concerning safety issues; it is expressed through the beliefs, values, and behavioural norms of its managers, supervisors, and workforce, and is evident in company safety policy, rules, and procedures (Mearns & Flin, 1999; Clarke, 2000).

There are good numbers of definitions of safety climate/culture (Hansen, 1989; Cheyne, Cox, Oliver, & Tomas, 1998; Clarke, 2006) in the relevant literature shown in Table 3.1 and concepts of safety culture and climate are being used interchangeably. The common shared understanding of all these definitions is that safety is priority (Clarke, 2006).

**Table 3.1.** Definitions of Safety Climate and Safety Culture

<b>Reference</b>	<b>Definition of Safety Climate/Culture</b>
Zohar (1980)	A summary of molar perceptions that employees share about their work environments (safety climate).

<b>Reference</b>	<b>Definition of Safety Climate/Culture</b>
Glennon (1982a,b)	Employees' perceptions of the many characteristics of their organization that have a direct impact upon their behaviour to reduce or eliminate danger (safety climate) and, safety climate is a special kind of organizational climate
Brown and Holmes (1986)	A set of perceptions or beliefs held by an individual and/or group about a particular entity (safety climate)
Cox and Cox (1991)	Safety cultures reflect the attitudes, beliefs, perceptions, and values that employees share in relation to safety (safety culture)
Dedobbeleer and Beland (1991)	Molar perceptions people have of their work settings (safety climate)
International Safety Advisory Group (1991)	Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance (safety culture)
Pidgeon (1991)	The set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers, and members of the public to conditions considered dangerous or injurious (safety culture)
Ostrom, Wilhelmson, and Kaplan (1993)	The concept that the organization's beliefs and attitudes, manifested in actions, policies, and procedures, affect its safety performance (safety culture)
Advisory Committee on the Safety of Nuclear Installations (1993)	The safety culture of an installation is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of an organization's health and safety management (safety culture)

<b>Reference</b>	<b>Definition of Safety Climate/Culture</b>
Health and Safety Commission (1993)	The product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour (safety culture/climate)
Safety Research Unit (1993)	Not explicitly stated (safety climate)
Cooper and Philips (1994)	Safety climate is concerned with the shared perceptions and beliefs that workers hold regarding safety in their work place (safety climate)
Geller (1994)	In a total safety culture (TSC), everyone feels responsible for safety and pursues it on a daily basis (safety culture)
Niskanen (1994)	Safety climate refers to a set of attributes that can be perceived about particular work organizations and which may be induced by the policies and practices that those organizations impose upon their workers and supervisors (safety climate)
Coyle, Sleeman, and Adams (1995)	The objective measurement of attitudes and perceptions toward occupational health and safety issues (safety climate)
Berends (1996)	The collective mental programming towards safety of a group of organization members (safety culture)
Lee (1996)	The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, and organization's health and safety management (safety culture)
Cabrera, Isla, and Vilela (1997)	The shared perceptions of organizational members about their work environment and, more precisely, about their organizational safety policies (safety climate)

<b>Reference</b>	<b>Definition of Safety Climate/Culture</b>
Williamson, Feyer, Cairns, and Biancotti (1997)	Safety climate is a summary concept describing the safety ethic in an organization or workplace which is reflected in employees' beliefs about safety (safety climate)
George and Jones (2000)	The informal set of values and norms that controls the way individuals and groups interact with each other and with people outside the organization in order to improve the safety performance (safety culture)

### **3.1.1. Risk Perception and Its Control**

Risk perception is one of the most important factors, which affects the workers' behaviours in the context of safety. Holmes, Gifford, and Triggs (1998) examined the control of risk at work which is influenced by perceptions and understandings of risk in occupational health and safety (OHS) among employers and employees.

Dedobbeleer and Beland (1991), in their validation study of safety climate model, found that demonstration of management commitment to OHS through actions and attitudes was one of two significant factors in worker's perceptions of their safety climate (Holmes et al., 1998). The second factor was worker's involvement in OHS and the researchers conceive that employee perception of risk and its control are related to their views about responsibility for risk and its control (Dedobbeleer & Beland, 1991). In line with these findings, inadequate control of risk in ways that employees understand to be responsible and effective may lead them to believe that management has no commitment to OHS. As a

result, these perceptions may lead to an increase in unsafe work practices among employees (Coyle et al., 1995).

There are conflicting perceptions of risk in OHS between employers and employees (Carson, 1985; Dwyer, 1991; Quinlan & Bohle, 1991; Holmes, Triggs, Gifford, & Dawkins, 1997a). These conflicting risk judgments were explained by three themes by Holmes et al. (1997a) (see Table 3.2). The study of Holmes et al. (1997a) shows that while employees accept risk as being part of job, employers believes that the source of the risk is employees in addition to economic factors for providing safe working environment.

**Table 3.2.** Themes of Riskiness of Employers and Employees for Immediate Effect Injury Linked OHS Risks

<b>Categories of themes</b>	<b>Themes</b>
Employers' themes	<ul style="list-style-type: none"> <li>▪ Risk is a function of <i>economic factors</i></li> <li>▪ <i>Individual attitudes</i> are the source of risk</li> </ul>
Employees' themes	Part of the job – <i>acceptance of risk</i> in the work environment
Shared themes	Risk is a function of <i>occurrence frequency</i>

Holmes et al. (1998) defines three approaches to risk and its control in OHS. Each approach contributes different but overlapping perspectives on the control of risk. These three approaches are conceptualized as follows:

## ***1. Technical Approaches***

Technical approaches to risk underline dependence on scientific, medical and technical expertise to identify and control risk (Walters & Haines, 1988; Le Nevez & Strange, 1989; Fiorino, 1989). Risk is often identified in terms of disease or injury outcomes rather than factors that lead the onset of ill-health (Walters & Haines, 1988; Larsson, 1991; Tesh, 1984; Holmes, Triggs, & Gifford, 1997b). Risk control in OHS is discussed in the technical literature in terms of a three-staged risk-management process (Ridley, 1990; Ansell & Wharton, 1992; Mathews, 1993; National Occupational Health and Safety Commission, 1994):

- ***First Stage:*** Identification of chemical, biological, physical and ergonomic hazards in the workplace.
- ***Second Stage:*** Assessment of risk.
- ***Third Stage:*** Control hierarchy (Mathews, 1993). Risk control is achieved through the application of measures in a hierarchical order of effectiveness. This principle suggests that control measures targeting hazards at source and aim to change the external work environment are more effective than those that aim to change the behaviour of exposed workers.

Consequently, technological control measure such as substitution of hazardous substances by less hazardous substances and the use of engineering controls should be preferred instead of individual control measures that are based on behavioural change such as safe work practices and the wearing of personal protective equipment (Holmes et al., 1998).

## 2. *Psychological Approaches*

Psychological approaches examine individual cognitive perceptions of risk and perceived qualities of riskiness that influence lay people's risk judgments (Holmes et al., 1998). Risk perception studies using risk rating methods define qualities of risk that influence lay risk judgments (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978; Slovic, 1987) as follows:

- ***Voluntariness:*** Whether the risk was undertaken voluntarily by people.
- ***Knowledge about the risks:*** The extent to which the risk is known.
- ***Personal control of risk:*** The degree to which personal qualities and skills can be used to protect the individual.
- ***Chronic/Catastrophic:*** Killing many people at one time or many people one at a time.

High risk is related to perceptions that the hazard is uncontrollable; relatively unknown to both science and those facing the risk; and potentially catastrophic (Holmes et al., 1998).

The quality of personal control of risk has been a significant factor in risk-rating studies of lay judgments on technological and environmental risks (Fischhoff et al., 1978; Lindell & Earle, 1983; Kuyper & Vlek, 1984; Slovic, 1987). Hale and Glendon (1987), conceive that perceptions of control of risk is a critical determining factor in these judgments and discuss that lay processes of risk judgment are initiated by a qualitative decision of whether the risk is controllable by human intervention (Holmes et al., 1998).

Hale and Glendon (1987) indicate that a minority of individuals attached different importance to each quality of risk and this situation may be the evidence of global cognitive styles. The concept of global cognitive styles is used to explain individual differences that emerge as a consequence of social group differences like opponents and supporters of nuclear power, and employers and employees (Holmes et al., 1998).

### **3. *Social Approaches***

Social approaches investigate how meanings of risk are constructed within social groups and how people's understandings and perceptions of risk are formed by social factors and experiences.

Some researchers conceive that studies based on a psychological approach to risk fail to address broader social contexts of risk judgments and they discuss that social contexts influence the perception of risk (Heimer, 1988; Otway & Thomas, 1982; Rayner, 1992; Douglas & Wildavsky, 1982). Therefore, the qualities of risk are not universal and absolute but have different meanings to different social groups (Holmes et al., 1998).

Beck (1992) proposes that risk is socially produced as an intrinsic aspect of wealth production and is inequitably distributed in society as is wealth. Conflict about risk is therefore embedded in conflicts about social inequalities (Holmes et al., 1998). In the social context of industrial relations, the relationship between employers and employees is unequal because employers have more power to control conditions of work than employees (Holmes et al., 1998). Therefore, conflicts about risk control between employers and

employees result from an underlying social inequality that produces industrial disputes and strike action by employees (Carson, 1985; Le Nevez & Strange, 1989; Dwyer, 1991).

### **3.1.2. Measuring Safety Climate**

There are many researches conducted on safety climate in different industries with considering various dimensions of safety climate as it is seen in Table 3.3. In this research, safety climate concept is going to be measured as the combination of the scales developed by Zohar (1980), Brown and Holmes (1986), Dedobbeleer and Beland (1991), and Clarke (2006). The safety climate model of Zohar (1980) conducted on Israelian industrial organizations (steel, food processing, chemical, and textile industry) included eight dimensions:

1. Importance of safety training programs,
2. Management attitudes toward safety,
3. Effects of safe conduct on promotion,
4. Level of risk at workplace,
5. Effects of required work pace on safety,
6. Status of safety officer,
7. Effects of safe conduct on social status,
8. Status of safety committee.

**Table 3.3.** Overview of the Amount of Questions, Surveyed Population, and Dimensions of Safety Culture and Climate Researches

Reference	No. of Questions/instrument	Population	Type of Analysis	Climate/Culture Dimensions
Zohar (1980)	40, questionnaire is administered during interview	20 Israelian industrial organizations (steel, food processing, chemical, and textile industry); 400 respondents	Exploratory	<ul style="list-style-type: none"> <li>- Importance of safety training programmes</li> <li>- Management attitudes towards safety</li> <li>- Effects of safe conduct on promotion</li> <li>- Level of risk at work place</li> <li>- Effects of required work pace on safety</li> <li>- Status of safety officer</li> <li>- Effects of safe conduct on social status</li> <li>- Status of safety committee</li> </ul>
Glennon (1982a,b)	68, self-administered questionnaire (SAQ)	Line managers from eight Australian companies (bauxite, mining, sawmilling and logging metal refining, petroleum refining, cement manufacture and general engineering and manufacturing); 198 respondents	No formal testing	<ul style="list-style-type: none"> <li>- Perceived influence of safety and health legislation</li> <li>- Perceived corporate attitude to safety and health</li> <li>- Perceived organizational status of safety advisory officer</li> <li>- Perceived importance of safety and health training</li> <li>- Perceived effectiveness of encouragement (vs. discipline) in promoting safety</li> <li>- Perceived effect of departmental/section safety record on promotion</li> <li>- Perceived risk level of workplaces</li> <li>- Perceived status of safety targets relative to production pressures</li> </ul>
Brown and Holmes (1986)	40, SAQ	10 American manufacturing and produce companies; 425 respondents	Confirmatory	<ul style="list-style-type: none"> <li>- Employee perception of how concerned management is with their well-being</li> <li>- Employee perception of how active management is in responding to this concern</li> <li>- Employee physical risk perception</li> </ul>
Cox and Cox (1991)	18 (+ 4), SAQ	Employees of an European company involved in the production and distribution of industrial gasses; 630 respondents	Exploratory	<ul style="list-style-type: none"> <li>- Personal scepticism</li> <li>- Individual responsibility</li> <li>- Safeness of work environment</li> <li>- Effectiveness of arrangements for safety</li> <li>- Personal immunity</li> </ul>

Reference	No. of Questions/instrument	Population	Type of Analysis	Climate/Culture Dimensions
Dedobbeleer and Beland (1991)	9, SAQ	9 construction sites; 272 respondents	Confirmatory	<ul style="list-style-type: none"> <li>- Management's commitment to safety</li> <li>- Worker's involvement in safety</li> </ul>
Ostrom et al. (1993)	88, SAQ	Employees of the Department of Energy in Idaho and its eight contractors; ± 4000 administered	No formal testing	<ul style="list-style-type: none"> <li>- Safety awareness</li> <li>- Teamwork</li> <li>- Pride and commitment</li> <li>- Excellence</li> <li>- Honesty</li> <li>- Communications</li> <li>- Leadership and supervision</li> <li>- Innovation</li> <li>- Training</li> <li>- Customer relations</li> <li>- Procedure compliance</li> <li>- Safety effectiveness</li> <li>- Facilities</li> </ul>
Safety Research Unit (1993)	65, SAQ	Workers from steel and chemical industries; a total of 1475 respondents	Exploratory	<ul style="list-style-type: none"> <li>- Management/supervisor satisfaction</li> <li>- Management/supervisor knowledge</li> <li>- Management/supervisor encouragement and support</li> <li>- Management/supervisor enforcement</li> <li>- Personal management contact</li> <li>- Management support: meetings</li> <li>- Shopfloor satisfaction</li> <li>- Shopfloor environment: hardware</li> <li>- Work group support/encouragement</li> <li>- Shopfloor training</li> <li>- Global self safety</li> <li>- Meetings</li> <li>- Safe working procedures</li> <li>- Safety information</li> <li>- Safety representatives: practice</li> <li>- Safety representatives: authority</li> </ul>

Reference	No. of Questions/instrument	Population	Type of Analysis	Climate/Culture Dimensions
Cooper and Philips (1994)	50, SAQ	Personnel of a packaging production plant; 374 (pre) and 187 (post) respondents	Exploratory	<ul style="list-style-type: none"> <li>- Management attitudes towards safety</li> <li>- Perceived level of risk</li> <li>- Effects of work pace</li> <li>- Management actions towards safety</li> <li>- Status of safety officer and committee</li> <li>- Importance of safety training</li> <li>- Social status of safety and promotion</li> </ul>
Niskanen (1994)	22 (workers) and 21 (supervisors), SAQ	Workers and management in maintenance, construction, and central repair shops; 1890 (workers) and 562 (supervisors) respondents	Exploratory	<p><u>Workers</u></p> <ul style="list-style-type: none"> <li>- Attitude towards safety in the organization</li> <li>- Changes in work demands</li> <li>- Appreciation of the work</li> <li>- Safety as part of productive work</li> </ul> <p><u>Supervisors</u></p> <ul style="list-style-type: none"> <li>- Changes in job demands</li> <li>- Attitude towards safety within the organization</li> <li>- Value of the work</li> <li>- Safety as part of productive work</li> </ul>
Geller (1994)	—	—	—	<ul style="list-style-type: none"> <li>- Person i.e. knowledge, skills, abilities, intelligence, motives, personality</li> <li>- Behaviour i.e. complying, coaching, recognising, communicating, demonstrating actively caring</li> <li>- Environment i.e. equipment, tools, machines, housekeeping, heat/cold, engineering</li> </ul>
Coyle et al. (1995)	30 (organization 1) and 32 (organization 2)	Workforce of two organizations “involved in the provision of health care and social services to the elderly” (incl. office, nursing and social work duties); 340 (org. 1), 540 (org. 2) respondents	Exploratory	<p><u>Organization 1</u></p> <ul style="list-style-type: none"> <li>- Maintenance and management issues</li> <li>- Company policy</li> <li>- Accountability</li> <li>- Training and management issues</li> <li>- Work environment</li> <li>- Policy/procedures</li> <li>- Personal authority</li> </ul>

Reference	No. of Questions/instrument	Population	Type of Analysis	Climate/Culture Dimensions
Coyle et al. (1995) (continued)				<u>Organization 2</u> - Work environment - Personal authority - Training and enforcement of policy
Berends (1996)	34, SAQ	Three industrial organizations (two chemical process industries and one steel company); a total of 434 respondents	Exploratory	- Confidence in the arrangements for safety - Compliance with safe working practices - Perceived priority given to safety - Own active effort put in safety matters - Communication about safety
Lee (1996)	172, SAQ	Employees at British nuclear industry site; 5295 respondents	Exploratory	<u>Safety Procedures</u> - Confidence in the safety procedures - Safety rules: - Personal understanding of safety rules - Perceived clarity of safety rules - Permit to work system (PTW): - Confidence in effectiveness of PTW - General support for PTW - Perceived need for PTW <u>Risks</u> - Personal caution over risks - Perceived level of risk at work - Perceived control of risks in the plant - Personal interest in job - Job satisfaction: - Contentment with job - Satisfaction with work relationships - Satisfaction with rewards for good work <u>Participation/Ownership</u> - Self-participation in safety procedures - Perceived source of safety suggestions - Perceived source of safety actions - Perceived personal control over safety

Reference	No. of Questions/instrument	Population	Type of Analysis	Climate/Culture Dimensions
Lee (1996) (continued)				<u>Design</u> - Satisfaction with design of plant - Training: - Satisfaction with training Selection: - Satisfaction with staff suitability
Cabrera et al. (1997)	69, SAQ	Employees of several companies at three European airports (ground handling divisions from four airlines, one fuel company, two airport authorities); totalling 389 respondents	Exploratory	- Organizational emphasis on safety - Communication channel about safety - Safety level perceived on the job - Feedback performance on safety - Specific strategies of accident prevention
Williamson et al. (1997)	67, SAQ	7 workplaces, covering heavy and light industry and outdoor workers, totalling 660 responses	Exploratory	- Personal motivation for safety - Positive safety – Practice - Risk justification – Fatalism - Optimism
Darbra et.al. (2007)	80 (consisting of five sections and one of them for measuring safety culture and perceived risk) questionnaire is administered during interview	Australian and New Zealand maritime pilots; 77 respondents	Exploratory	- Training - Communication - Commercial pressure - Incident investigations - Fatigue management - Support services - Regulating authorities - Incident reporting system

This model was validated by Brown and Holmes (1986) on an American sample of production workers and was reduced from an eight-factor model to a three-factor model. In this three-factor model, the following dimensions were retained:

1. Employee perception of how concerned management is with their well-being (Management Concerns).
2. Employee perception of how active management is in responding to this concern (Management Safety Activities).
3. Employee physical risk perception (Employee Risk Perception).

Dedobbeleer and Beland (1991) tested the three-factor safety climate model of Brown and Holmes (1986) on construction workers in the United States and according to the results of their study, they conducted two-factor safety climate model which also provides some support for the model of Brown and Holmes (1986). These two main conceptual dimensions of so-called safety climate are:

1. Management Commitment to Safety
2. Workers' Involvement in Safety

The management commitment factor comprised workers' perceptions of management's attitude toward safety practices and workers' safety, workers' perception of foreman's behaviour, and availability of proper equipment and safety instructions at the time of initial employment (Dedobbeleer & Beland, 1991).

The second factor included workers' perceptions of susceptibility to injuries in the next 12 months, risk-taking at work, perception of control over one's own safety on the job, and presence of regular safety meetings. And as workers' perception of risk was related to items expressing workers' perceptions of control over their own safety, the second factor was labelled "workers' involvement in safety" (Dedobbeleer & Beland, 1991).

The survey instrument of Clarke (2006) was generated for the offshore oil industry by Flin, Mearns, Fleming, and Gordon (1996) and later, they developed this survey instrument by their study realized in 2001. Clarke (2006) omitted some of the items to adapt the instrument for using in the automotive industry. According to the research findings of Clarke (2006), there are three main factors which determine the safety climate perception:

1. Management concern for safety,
2. Worker's response to safety,
3. Conflict between production and safety.

### **3.2. Organizational Commitment**

The concept of organizational commitment has grown in popularity in the literature of industrial and organizational psychology and organizational behaviour for almost half a century. Of all the forms of commitment, the organizational form still receives the most attention (Griffin & Bateman, 1986, p. 166). This interest is obvious from the numerous studies that have examined the relations between organizational commitment and its antecedents and outcomes (Mowday et al., 1982; Mathieu & Zajac, 1990; cited in Cohen,

2003). This high degree of attention results from the fact that organizational commitment is theory based, broad in focus, holds significant integrative potential, and may be more manageable than other forms (Griffin & Bateman, 1986, p. 166; Cohen, 2003). The perception that organizational commitment can predict turnover better than other work attitudes is another reason attracting the interest for studying the concept (Williams & Hazer, 1986; Clugston, 2000). Furthermore, the concept was developed due to the need for discovering employee-organization linkages. Mowday (1998) suggests that committed employees would be beneficial due to the potential for increased performance, reduced turnover, and reduced absenteeism. It is argued that organizations whose members have higher levels of commitment show higher performance and productivity and lower level of absenteeism and tardiness (Morris & Sherman, 1981; Bateman & Strasser, 1984). The study of Lowe & Barnes (2002) has also showed that high levels of organizational commitment are statically correlated to decreased levels of turnover and turnover intention behaviors, and more consistent to higher levels of individual, group, and organizational performance.

Organizational commitment has been defined by attitudinal and behavioral schools of thoughts with different approaches (Reichers, 1985). The approach of attitudinal school originates from the studies of Porter, Steers, Mowday, and Boulian (1974), Buchanan (1974), Mowday, Steers, and Porter (1979), and Allen and Meyer (1990) and defines organizational commitment as an attitude which reflects the nature and quality of the linkage between an employee and an organization. The attitudinal approach recognizes that the identity of the person is linked to the organization (Sheldon, 1971, p. 143); therefore, the person develops an emotional or psychological attachment to his or her employer.

Commonly accepted definition of organizational commitment was generated by Porter, Steers, Mowday, and Boulian (1974) and they described commitment as the relative strength of an individual's identification with and involvement in a particular organization. Buchanan (1974) conceived commitment as a partisan, affective attachment to the goals and values of an organization, to one's role in relation to the goals and values, and to the organization for its own sake, apart from its purely instrumental worth (Yahyagil, 1999).

The behavioral approach, on the other hand, was developed by Becker (1960), Kiesler (1971), and Salancik (1977) and according to the behaviorists, organizational commitment is demonstrated by "overt manifestations of commitment" (Mowday et al., 1979, p. 225) to the organization such as extra-role behaviors that link employees to their respective institution (Yahyagil, 1999). Furthermore, employees accumulate "investments" or "side-bets" that make leaving the organization very costly by remaining with the organization (Becker, 1960; Meyer & Allen, 1984).

For Becker (1960), commitment was the tendency to engage in "consistent lines of activity" because of the perceived cost of doing otherwise. Another definition of behavioral commitment was developed by Salancik (1977) and defined as a state of being in which an individual becomes bound by his actions and through these actions to beliefs that sustain the activities and his own involvement.

Becker's (1960) side-bet theory was the earliest commitment research and has a widespread acceptance and use in the relevant researches. This theory asserts that commitment is built on the principle of consistent behavior: "Commitments come into

being when a person, by making a side-bet, links extraneous interests with a consistent line of activity”.

Commitment is primarily a function of individual behavior; individuals become committed to the organization through their actions and choices over time (Becker, 1960). Side-bets are defined as anything the employee would view as valuable or that he/she has made an investment such as time, effort, money, pension plans, work relationships, and organizational specific skills. When the employee discontinues the employer-employee relationship, these investments are lost. The theory of Becker (1960) views commitment as a behavioral approach that predisposes employees to consistently engage in those behaviors as a result of the accumulation of “side-bets” that would be lost if the behaviors were discontinued (Meyer & Allen, 1984). The threat of losing these investments, along with a perceived lack of alternatives to replace or make up for them, commits the person to the organization (Cohen, 2003). According to this view, the individual is bound to the organization by extraneous factors such as income and hierarchical position, and internal factors such as “knowing the ropes” and interpersonal relations (Meyer & Allen, 1984; Cohen & Lowenberg, 1990; Cohen & Gattiker, 1992; Cohen, 1993; Wallace, 1997).

In 1961, Etzioni identified and categorized commitment types as moral, calculative, and alienative. Etzioni (1961) suggests a commitment model focusing on employee compliance with organizational objectives. The model is based on the argument that any actual or perceived authority or power organizations have over individuals is rooted in the nature of employee commitment in the organization. This means that organizations have substantially less authority or power over employees who have lower levels of

commitment. Etzioni (1961) concludes when employees have higher levels of commitment to organizational objectives, the organization will have more authority or power over these same employees.

Kanter (1968) developed a different approach accepting that different types of commitment result from the different behavioral requirements imposed on employees by the organization. Her model suggests three different forms of commitment:

1. ***Continuance commitment*** represents the member's dedication to the survival of the organization. It is caused by requiring members to make personal sacrifices to join or remain with an organization. A long certification/orientation process and having members with significant tenure were given as an example to this type of commitment (Lowe & Barnes, 2002).
2. ***Cohesion commitment*** is identified as an attachment to social relationships in an organization brought on by such techniques as public renunciation of previous social ties or by engaging in ceremonies that enhance group cohesion (Kanter, 1968). Examples of this type of commitment could be the use of uniforms or badges and employee recognition programs such as employee of the year (Lowe & Barnes, 2002).
3. ***Control commitment*** is defined by Kanter (1968) as a member's attachment to the organization's norms that shape behavior in desired directions. Control commitment exists when employees believe their organization's norms and values serve as a model for suitable behavior. Consequently, these suitable

behaviors result in an atmosphere of “what is good for the organization is also good for me”.

The model of Kanter (1968) proposes that these three commitment approaches are highly interrelated; therefore, organizations can use all three approaches simultaneously to influence higher levels of commitment to the organization.

Sheldon (1971, p. 143) defined organizational commitment as an attitude which reflects the nature and quality of the linkage between an employee and an organization.

Porter, Steers, Mowday, and Boulian (1974) defined organizational commitment as an individual’s belief in and acceptance of the goals and values of the organization, and a strong desire to remain in an organization.

Aven (1988) proposes that committed employees are more likely to engage in the following four behaviors more often and more consistently than are non-committed employees:

1. Committed employees have higher levels of participation.
2. Committed employees remain with the organization for longer periods and make more contributions for achieving organizational objectives.
3. Committed employees are more highly involved in their jobs.
4. Committed employees exert considerably more effort on behalf of the organization.

There is a general agreement that organizational commitment by employees is a highly desirable psychological state (Aven, 1988).

Umstot (1988) indicates that one of the most important factors that is involved in the concept of organizational commitment is long-term job security together with the opportunities to participating in decision-making process, having autonomy and responsibility in the jobs being performed.

Empirical data obtained by McCormick and Ilgen (1988) indicates that age, tenure, teamwork, organizational culture, decentralized organizational structure are also among the causes of organizational commitment and its outcomes are attendance, job satisfaction, turnover, loyalty, and performance effectiveness.

In their research, Balfour and Wechsler (1994) identified the three types of commitment as exchange, affiliation, and identification.

Hartmann and Bambacas (2000) propose that organizational commitment composed of several factors like job satisfaction could be explained as identification and involvement with the organization. It refers to a willingness to spend an extra effort for the organization, a definite belief and a positive attitude toward organizational values and goals, and a strong desire for remaining with the organization.

Swales (2002) proposes that measuring organizational commitment, in fact, is an assessment of the congruence between an individual's own values and beliefs and those of the organization.

Boles, Madupalli, Rutherford, and Wood (2007) defined organizational commitment as reflection of positive feelings towards the organization and its values.

### **3.2.1. The Multidimensional Views of Commitment**

While many previous commitment approaches are one-dimensional, O'Reilly and Chatman (1986) and Meyer and Allen (1991) discuss multi-dimensional models. O'Reilly and Chatman (1986) suggested three different types of psychological bonds that provide the foundation for commitment (Yahyagil, 2005). Model of O'Reilly and Chatman (1986) was redefined by Jaros, Jermier, Koehler, and Sincich (1993) and applied in research on the effects of organizational change on employees by Bennet and Durkin (2000). Stemming from the research of Kelman (1958) on attitude and behavioral change, O'Reilly and Chatman (1986) suggests that commitment to organization can take three distinct forms:

1. ***Compliance*** or instrumental involvement for specific, extrinsic rewards, that is, compliance occurs when attitudes and behaviors are adopted not because of shared beliefs but simply to gain specific rewards.
2. ***Identification*** or involvement based on a desire for affiliation, that is, identification occurs when an individual accepts influence to establish or maintain a satisfying relationship. Furthermore, an individual may feel proud to

be a part of a group, respecting its values and accomplishments without adopting them as his or her own.

3. **Internalization** or involvement predicated on congruence between individual and organizational values, that is, internalization occurs when influence is accepted because the induced attitudes and behaviours are congruent with one's own values. The values of the individual and the group or organization are the same.

An employee's psychological attachment to an organization can reflect varying combinations of these three psychological foundations (O' Reilly & Chatman, 1986). The Kelman's typology of compliance, identification, and internalization can be used to understand the motives underlying behaviour in work settings (O' Reilly & Chatman, 1986). Within this framework, they demonstrate that non-instrumental motives influence both extra-role behavior which refers to the desire by employees to go above and beyond what is normally expected of them (Steers & Porter, 1987) and turnover intention. Identification-based and internalization-based commitments were found to be positively related to extra-role behaviors and negatively related to turnover. On the other hand, compliance-based commitment was found to be unrelated to both extra-role behavior and actual turnover with the exception of a significant association with intent to leave (Yahyagil, 2005).

O' Reilly and Chatman's (1986) model has been weakened due to the difficulty of distinguishing identification and internalization: the measures tend to correlate highly with one another and to show similar patterns of correlations with measures of other variables

(Caldwell, Chatman, & O'Reilly, 1990; O'Reilly, Chatman, & Caldwell, 1991; Vandenberg, Self, & Seo, 1994). Therefore, O'Reilly and his colleagues combined the identification and internalization and formed a measure called normative commitment in their more recent research (Caldwell et al., 1990; O'Reilly et al., 1991).

Allen and Meyer's (1990) model recognizes the values of different facets toward commitment and integrates them into a theoretical framework. Allen and Meyer (1990) defined organizational commitment as consisted of three components:

- (1) *Affective commitment* refers to employee's emotional attachment to, identification with, and involvement in the organization. In other words, employees with strong affective commitment stay with the organization because they *want* to (Meyer & Allen, 1991).
- (2) *Continuance commitment* refers to commitment based on the costs that employees associate with leaving the organization. In other words, employees with strong continuance commitment stay with the organization because they *need* to (Meyer & Allen, 1991).
- (3) *Normative commitment* refers to employees' feelings of obligation to remain with the organization because of personal loyalty and/or allegiance. In other words, employees with strong normative commitment stay with the organization because they feel they *ought* to do so (Meyer & Allen, 1991).

The net sum of a person's commitment to the organization reflects each of these separable psychological states (affective attachment, perceived costs, and obligation) (Allen &

Meyer, 1990, p. 4). They suggest that each component should develop from causes because of the distinction. Affective component is expected to develop on the basis of work experiences that increases the employee's feeling of challenge and comfort in the organization. Continuance component develops as a function of the number and magnitude of investments employees make in their organization (e.g. pension contributions and the degree to which they feel they have employment alternatives). Finally, they argued that the antecedents of normative commitment include early socialization experiences (e.g. parental emphasis on the loyalty to an employer) as well as those that occur after organizational entry.

According to Spector (1996), the most outstanding contribution to the examination of the concept of organizational commitment was made by the study of Meyer, Allen, and Smith (1993) which is called "three-component model". They defined the three types of organizational commitment as follows:

- *Affective commitment* is related to employees' feelings and belongingness and sense of attachment to the organization.
- *Continuance commitment* is related to feeling of employees in relation to their monetary benefits especially when it is difficult to have another job.
- *Normative commitment* is related to the values of employees.

A research carried out by Ko, Price, and Mueller (1997, p. 962) showed outstanding results. According to the findings of Ko and et al. (1997), affective commitment is largely the result of rewards or punishments; the determinants of continuance commitment are

self-investment, general training, social support, and opportunity; and the determinants of normative commitment are socialization and exchange (Yahyagil, 2005).

The research findings of Hartmann and Bambacas (2000) supported the three component model of Meyer and Allen and they summarized the model of Meyer and Allen as follows: the employees with high affective commitment would like to remain in the organization due to the fact that that is their desire; the employees with high continuance commitment would like to stay in organization because they need to do so; and finally, the employees with high normative commitment want to stay in the organization simply because they feel themselves they should do so (Yahyagil, 2005).

### **3.2.2. Measuring Organizational Commitment**

Researchers developed various scales to measure the organizational commitment. The most extensively used scale in research was developed by Mowday, Porter, and Steers (1979) which is called as Organizational Commitment Questionnaire (OCQ). The validity and reliability of OCQ for measuring organizational commitment have been proven by researchers in different studies (Mowday, Steers, & Porter, 1982; Lee & Johnson, 1991; Martin & Hafer, 1995).

Mowday et al. (1979) conducted OCQ on 2563 employees in nine different organizations and identified 15 items to assess an employee's belief in and acceptance of the organization's goals, their willingness to expand effort, and their desire to maintain membership of the organization which are related to organizational commitment.

The instrument developed by O' Reilly and Chatman (1986) for their three-component model of organizational commitment was tested by Sutton & Harrison (1993) and the results they found did not support O' Reilly and Chatman's findings (Yahyagil, 2005). The factor analysis conducted by Sutton and Harrison (1993) revealed two factors: one consisting of both the internalization and identification, and a second one which may be related to compliance (Yahyagil, 2005). Nevertheless, the research results of Sutton and Harrison (1993) supported affective and continuance factors of Meyer and Allen (1984). Meyer, Allen, and Smith (1993) developed an instrument for assessing the three components of organizational commitment and this scale for assessing the three separate variables of commitment was supported by the research of Dunham, Grube, and Castaneda in 1994 (Yahyagil, 2005).

Meyer and Allen's research (1991) showed that affective commitment dimension is a more effective measure of organizational commitment in compared to the other two dimensions of commitment and also, employees with higher levels of affective commitment to their work, their job, and their career exhibit higher levels of continuance and normative commitments (Cohen, 1996). Since affective organizational commitment appears to directly influence effort as well as indirectly influence the other forms of commitment, this research focuses on affective organizational commitment.

### **3.3. Job Satisfaction**

The most common definition of job satisfaction has been generated by Ivancevich, Olelelns, and Matterson (1997) as "an attitude that individuals have about their jobs. It

results from their perception of their jobs and the degree to which there is a good fit between the individual and the organization". It is an extent to which one feels positively or negatively about the intrinsic and/or extrinsic aspects of one's job (Hunt, Chonko, & Wood, 1985; Bhuian & Menguc, 2002). Furthermore, job satisfaction has been described as being related to individual values and their feelings of satisfaction in their work. Under the social-dimension aspect, job satisfaction can also be defined as resulting in positive feelings at the end of the job (Aksu & Aktaş, 2005). Job satisfaction may also refer to an employee's overall evaluation of the job or specific components or tasks associated with the job (Andrisani, 1978).

Job satisfaction has been an important variable for researchers in understanding employee behaviours and attitudes; therefore, a lot of researches have been conducted on job satisfaction. The study of Brown and Peterson (1993) showed that satisfaction with job was directly related to organizational commitment. Job satisfaction is either directly (Netemeyer, Johnston, & Burton, 1990) or indirectly (Brown & Peterson, 1994) related to an employee's turnover intentions.

Robbins (2002) states that job satisfaction represents an attitude rather than behaviour and has direct relationship to performance factors and the value preferences. An employee with a high level of job satisfaction holds positive attitudes about the job while an employee who is dissatisfied with his or her job holds negative attitudes about the job (Robbins, 2002).

An employee's job is more than just the obvious activities such as shuffling papers, designing a product, driving a forklift, and so on. Jobs require interaction with co-workers and bosses, following organizational rules and policies, meeting performance standards, living with working conditions that are often less than ideal, and the like. This shows that an employee's assessment of how satisfied or dissatisfied he or she is with his or her job is a complex summation of a number of discrete job elements (Robbins, 2002).

Many researchers have examined job satisfaction as a single construct. Not many of them have considered different facets of job satisfaction (Boles, Wood, & Johnson, 2003). There is substantial evidence that job satisfaction is a multi-faceted construct (Churchill, Ford, & Walker, 1974; Comer, Machleit, & Lagace, 1989; Lagace, Goolsby, & Gassenheimer, 1993).

### **3.3.1. Measuring Job Satisfaction**

The two widespread job satisfaction measurement approaches are a single global rating and a summation score consisting of a number of job facets. The single global rating method seeks for the response to one question such as "All things considered, how satisfied are you with your job?" and then, respondents reply by circling a number between one and five that corresponds to answers from "highly satisfied" to "highly dissatisfied" (Robbins, 2002).

The other approach, summation of job facets, identifies key elements in a job and asks for the employee's feelings about each (Robbins, 2002). In order to precisely measure job satisfaction and thus, attain a broad measure of employee beliefs and attitudes about the

job, various job characteristics may need to be evaluated (Churchill et al., 1974). Ronan (1970), Churchill and his colleagues (1974), and Futrell (1979) suggested various work related constructs which have been linked to satisfaction such as work content, control of work and actual performed tasks, direct supervision, promotion opportunities, financial rewards, co-workers, and working conditions. Taber and Alliger (1995) and Johnson and Johnson (2000) also indicates that employees develop attitudes toward such job facets as work, pay, promotion, co-workers, company policies, supervisors, and customers in their organizational researches. For measuring job satisfaction, Robbins (2002) proposes job facets that would be included are nature of the work, supervision, present pay, promotion opportunities, and relation with co-workers. These factors are rated on a standardized scale and then, added up to create an overall job satisfaction score.

Robbins (2002) indicates that none of the foregoing approaches is superior to the other and this is one of the rare instances in which simplicity seems to work as well as complexity: comparisons of single global ratings with the more lengthy summation of job facets method shows that the former is fundamentally as valid as the latter.

The degree of importance of the job facets may change individual to individual. For instance, an employee who is very satisfied with his or her supervisor, salary, company policies may be dissatisfied with other aspects of work such as the actual work itself (Boles et al., 2007).

The primary mechanism that influences **organizational commitment** is the exchange process (Stevens, Beyer, & Trice, 1978). Through the evaluation of costs and benefits,

individual needs and desires are satisfied and results in a positive affective state towards the organization, work, and work environment (Boles et al., 2007).

Boles and his colleagues (2007) tested the relationship between job satisfaction facets and affective organizational commitment on salespeople. They investigated this relationship from a more detailed perspective of job satisfaction facets rather than global or overall job satisfaction. The job facets they investigated are customer, promotion, pay, company policy, supervisor, co-worker, and the work itself. Their research showed that different facets of job satisfaction have varying relationships with one's affective commitment towards the organization. Therefore, they suggested that observing the relationship between different job facets and affective organizational commitment can be useful for an organization in understanding their workers and how different aspects of the work may have disproportionate influence on affective organizational commitment.

## **4. METHODOLOGY**

### **4.1. Sampling Procedure**

The data analyzed in the research represents a census from one shipyard located in Kocaeli and four shipyards located in Tuzla Shipyards Region in İstanbul. The respondents were consisted of employees and managers from lower, middle, and upper levels, and employed by either the shipyard or subcontractor.

The surveys were distributed to 72 workers in Shipyard A (Kocaeli), 53 workers in Shipyard B (Tuzla), 35 workers in Shipyard C (Tuzla), 33 workers in Shipyard D (Tuzla), and 73 workers in Shipyard E (Tuzla). Totally, the surveys were distributed to 266 workers in the five shipyards. Of the surveys distributed and returned, a usable sample size of 70 responses from Shipyard A, 53 responses from Shipyard B, 25 responses from Shipyard C, 33 responses from Shipyard D, and 68 responses from Shipyard E were obtained. Totally, 249 responses were obtained from the five shipyards. As a result, sampling frame includes 266 questionnaires, but number of useful questionnaires is 249. The effective response rate is 93.6 percent. The high response rate is partly due to the shipyard management supporting the research and their assistance for me to distribute the surveys directly to the workers in the shipyards except Shipyard C. In shipyard C, the surveys were distributed and collected by health, safety, and environment responsible and then, the completed surveys were sent to me later. The effective response rate in this shipyard was 71.4. This result shows that this way of survey application is not appropriate for this research in order

to get valid surveys. In the other shipyards, the completed surveys were collected directly by me as soon as the respondents finished filling them.

Positions of the respondents were classified as follows: respondents having university and higher education were accepted as upper level worker (manager); respondents having high school and lower education were accepted as lower level worker (employee). The term, “worker” is used for both managers and employees in this research.

The time period for survey application was approximately five months because getting permission for the survey application from the shipyards and finding the proper application time were difficult at some shipyards. Furthermore, while some shipyards were supportively accepting my research, some didn’t want to get involved due to the public and media pressure resulting from the serious accidents and injuries occurred during the research period.

## **4.2. Measurement Instruments**

The research measures were generated from well established measurement scales for safety climate, affective organizational commitment, and different facets of job satisfaction.

The six-point Likert scale was employed in order to prevent the option for neutrality or indecision and force respondents to choose. Based on the item in the questionnaire, the participants rated the extent of their agreement. The scale is as follows:

1 = Strongly Disagree

2 = Disagree

3 = Somewhat Disagree

4 = Somewhat Agree

5 = Agree

6 = Strongly Agree

#### **4.2.1. Safety Climate Measure**

Safety climate was measured using the combination of two separate questionnaires: 11-item questionnaire of Clarke (2006), and reduced and modified version of 9-item questionnaire of Brown and Holmes (1986). The questionnaire of Clarke (2006) was based on a survey instrument which was generated for the offshore oil industry by Flin et al. (1996) and later, developed by Mearns et al. (2001). Clarke (2006) omitted some of the items to adapt the instrument for using in the automotive industry. Furthermore, 6 items of the questionnaire of Brown and Holmes (1986) were included to the safety climate questionnaire. These items assess availability of safety instructions, safety meetings, and proper equipment, and perceived control over work in terms of safety, perception of risk-taking, perceived likelihood of injuries (Brown & Holmes, 1986). The items were modified in order to make them proper for 6-point Likert scale. The safety climate questionnaire used in this research totally consists of 17 items (see Appendix B).

#### **4.2.2. Affective Organizational Commitment Measure**

Affective organizational commitment was measured using the reduced 9-item organizational commitment questionnaire (Porter et al., 1974; Mowday et al., 1979) (see Appendix C). The 9-item scale was developed because of the increasing concerns about the multi-dimensionality of organizational commitment construct during 1980s and the validity of original 15-item OCQ (Organizational Commitment Questionnaire) scale in measuring the same. Nine items of this scale focuses on the extent to which an individual identifies herself/himself, involves in a particular organization, and a willingness to exert considerable effort on behalf of the organization (Mowday et al., 1979). The reliability and validity of the measure has been established in several studies (Porter et al., 1974; Mowday et al., 1979; Michaels, Cron, Dubinsky, & Joachimsthaler, 1988; Johnston, Parasuraman, Futrell, & Black, 1990; Agarwal & Ramaswami, 1993; Mathieu, Bruvold, & Ritchey, 2000; Boles et al., 2007).

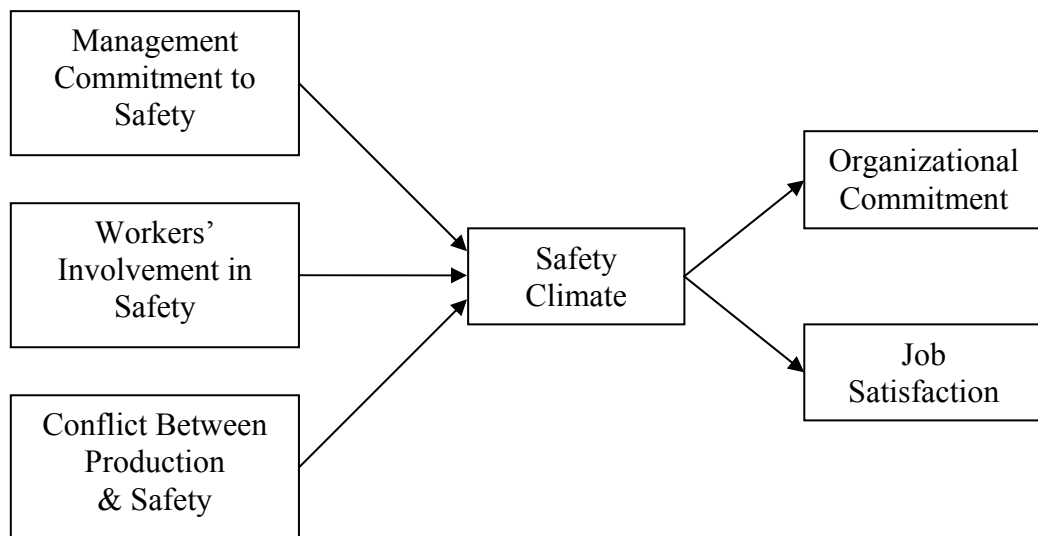
#### **4.2.3. Job Satisfaction Measure**

Job satisfaction was measured using reduced version of job satisfaction instrument of Boles and his colleagues (2007). The number of items in the questionnaire of Boles and his colleagues reduced from 28 to 8 items. The items selected were the ones proper for the object of the research. Boles and his colleagues used a reduced version of the INDSALES scale developed by Comer et al. (1989) and examined by Lagace et al. (1993) in order to measure various facets of job satisfaction (Boles et al., 2007). While the scale of Boles and his colleagues (2007) assesses satisfaction with customer, promotion, pay, company policy,

work, supervisor, and co-worker, the reduced scale used in this research assesses only satisfaction with supervisor, job, and co-workers (see Appendix D).

### 4.3. Research Design

Quantitative research approach is used in this research. The design of the study is hypothesis-testing (explanatory research), and its nature is correlational. The study is also cross-sectional. There are basically three key concepts analyzed in the research: safety climate, organizational commitment, and job satisfaction. The research model is shown below (Fig. 4.1).



**Figure 4.1.** Research Model

## 5. RESEARCH FINDINGS

The socio-demographic information about the respondents in terms of gender, age group, education level, job position, and experience is given in Table 5.1.

**Table 5.1.** Socio-Demographic Data for Respondents

<b>Sub-Scale</b>	<b>Values</b>	<b>N</b>	<b>Percentage</b>
<b>Gender</b>	Male	236	94.8
	Female	13	5.2
<b>Age Groups</b>	18 - 20	8	3.3
	21 - 25	42	17.1
	26 - 30	65	26.4
	31 - 35	44	17.9
	36 - 40	34	13.8
	41 - 45	17	6.9
	46 - 50	15	6.1
	51 - 55	14	5.7
	56 - 66	7	2.8
<b>Education Level</b>	Primary	62	24.9
	Secondary	36	14.5
	High School	74	29.7
	University	70	28.1
	Master	6	2.4
	PhD	1	.4
<b>Job Position</b>	Lower Level Workers (Employees)	172	69.1
	Upper Level Workers (Managers)	77	30.9
<b>Years Experience</b>	$0 < x \leq 1$	93	37.5
	$1 < x < 3$	69	27.8
	$3 \leq x < 5$	43	17.3
	$5 \leq x$	43	17.3

As a result of the reliability analyses of the measurement instruments, one of the variables in safety climate questionnaire was excluded and the Cronbach's alpha was found as .749 for the remaining 16 variables, as .774 for the organizational commitment questionnaire, and as .789 for the job satisfaction questionnaire. They are all indicating statistically highly significant values.

A rotated factor analysis was conducted for safety climate questionnaire to understand the maximum amount of common variance in a correlation matrix by reducing a data set from a group of interrelated variables into a smaller set of uncorrelated factors (Field, 2000). Factor analyses are useful to find out similarities between theoretical constructs and the facts from real world (Yahyagil, 2003).

The first factor analysis extracted four factors, but the fourth factor comprised only two variables of the scale. Therefore, these variables (SC9 and SC13) were excluded and the factor analysis was repeated with remaining 14 variables.

**Table 5.2.** KMO and Bartlett's Test for Safety Climate Questionnaire

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.829
Bartlett's Test of Sphericity	Approx. Chi-Square	965.782
	Df	91
	Sig.	.000

In the second factor analysis, KMO value was found to be greater than .80 (see Table 5.2). This implies an appropriate pattern of correlations, and Bartlett's test, which shows

statistically high significance, indicates the R-matrix is not an identity test. Thus, the factor analysis is suitable for further statistical procedures.

The second factor analysis revealed three factors that explain 52.01 % of the total variance in the concept of safety climate: management commitment/concern for safety, workers' involvement/response to safety, and conflict between production and safety shown in Table 5.3. This result indicates the explanatory power of the measurement instrument in revealing the conceptual dimensions of safety climate.

**Table 5.3.** Factor Analysis for Safety Climate Section of the Questionnaire (N = 249)

<b>Factor Label</b>	<b>Components</b>	<b>Loading Values</b>	<b>Percentage of Variance Explained</b>
<b>Management Commitment/Concern for Safety</b>	SC1	.829	21.804
	SC3	.795	
	SC2	.785	
	SC4	.703	
	SC7	.415	
<b>Workers' Involvement/Response to Safety</b>	SC12	.688	16.454
	SC17	.613	
	SC14	.555	
	SC5	.546	
	SC8	.518	
	<b>SC11</b>	<b>.468</b>	
<b>Conflict Between Production and Safety</b>	SC15	.750	13.748
	SC16	.705	
	SC6	-.656	
	<b>SC11</b>	<b>.469</b>	

**Note:** Varimax with Kaiser Normalization criterion for loading = .40

Results of factor analysis showed that conceptual clarity exists in the dimensions of safety climate through three factors. There is only one variable (SC11) loaded onto more than one variable. Furthermore, the items loaded very strongly on particular factors. The composition of the variables of the factors is consistent with the theoretical articles and the outcomes of some empirical studies (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Clarke, 2006).

The first factor that revealed the management commitment/concern for safety is conspicuous. It comprises the workers' perception of management's attitude toward safety implementations and workers' safety, and attitude toward unsafe task (Clarke, 2006). The second factor that revealed the workers' involvement/response to safety comprises the presence of regular safety meetings, perceived likelihood of injuries, availability of proper equipment and safety instructions (Dedobbeleer & Beland, 1991), and perceived level of management's concern to her/his general welfare (Clarke, 2006). Finally, the third factor that revealed the conflict between production and safety implies the perceived pressure to put production before safety measures (Clarke, 2006), and risk perception at work (Dedobbeleer & Beland, 1991).

## **5.1. Hypothesis Testing**

As it is explained in detail, in terms of relevant theoretical framework, there are associations between the concepts of safety climate, organizational commitment, and job satisfaction. The study of Prussia, Brown, and Willis (2003) has found differences in safety issues between managers and employees. Empirical studies have found significant

relationships between low job satisfaction and high accident involvement (Holcum, Lehman, & Simpson, 1993; Lee, 1998), and between safety culture and satisfaction with work, job involvement, and organizational commitment (Morrow & Crum, 1998).

***H1. There are differences in the perception of safety climate between managers and employees.***

Independent sample t-test was conducted for testing this hypothesis and no difference found as a whole for the perception of safety climate between managers (upper level workers) and employees (lower level workers) (see Table 5.4). Further, t-tests performed for each variable of the safety climate concept and differences were found in regard to the the perception level of the attitude toward unsafe task (SC7) and perceived likelihood of injuries (SC17) (see Table 5.5).

The t-test performed to examine the attitudes toward unsafe task (SC7) indicated significant difference between managers and employees. The mean score of employees (M = 3.91) is greater than that of managers (M = 3.47) (see Table 5.6). This indicates that employees feel more independent than managers to refuse to work if they feel the task is unsafe.

The t-test performed to examine the perceived likelihood of injuries (SC17) also indicated significant difference between managers and employees. The mean score of employees (M = 4.18) is less than that of managers (M = 4.61) (see Table 5.6). This indicates that managers perceive the likelihood of injuries more than that of employees.

**Table 5.4.** Independent Sample T-Test Results for Safety Climate Concept

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
SAFETY CLIMATE	Equal variances assumed	0.020	<b>0.888</b>	-1.062	247	<b>0.289</b>	-1.43416	1.34989	-4.09293	1.22461
	Equal variances not assumed			-1.066	147.586	0.288	-1.43416	1.34475	-4.09162	1.22330

**Table 5.5.** Independent Sample T-Test Results for SC7 and SC 17 Variables of Safety Climate

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
SC7 People at this plant refuse to work if they feel the task is unsafe.	Equal variances assumed	0.552	<b>0.458</b>	2.078	247	<b>0.039</b>	0.439	0.212	0.023	0.856
	Equal variances not assumed			2.109	151.611	0.037	0.439	0.208	0.028	0.851
SC17 I think that the likeliness of injury on the job is high within the next year.	Equal variances assumed	18.050	<b>0.000</b>	-2.091	247	0.038	-0.430	0.206	-0.835	-0.025
	Equal variances not assumed			-2.412	208.267	<b>0.017</b>	-0.430	0.178	-0.782	-0.079

**Table 5.6.** Independent Sample T-Test Group Statistics for SC7 and SC17 Variables

	Position	N	Mean	Std. Deviation	Std. Error Mean
SC7 People at this plant refuse to work if they feel the task is unsafe.	Lower	172	<b>3.91</b>	1.561	0.119
	Higher	77	<b>3.47</b>	1.501	0.171
SC17 I think that the likeliness of injury on the job is high within the next year.	Lower	172	<b>4.18</b>	1.643	0.125
	Higher	77	<b>4.61</b>	1.114	0.127

*H2. There are differences in the perception of organizational commitment between managers and employees.*

Independent sample t-test was conducted for testing the hypothesis and no difference found as a whole for the perception of organizational commitment between managers and employees (see Table 5.7). Further, t-test performed for each variable of the organizational commitment concept and a difference was found in regard to the perception level of the care about the fate of the organization (OC8) (see Table 5.8).

The mean score of employees (M = 4.84) is less than that of managers (M = 5.19) (see Table 5.9). This indicates that employees care about the fate of the organization less than that of managers.

**Table 5.7.** Independent Sample T-Test for Organizational Commitment Concept

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
ORGANIZATIONAL COMMITMENT	Equal variances assumed	2.315	<b>0.129</b>	-1.190	247	<b>0.235</b>	-1.18137	0.99278	-3.13676	0.77403
	Equal variances not assumed			-1.236	160.462	0.218	-1.18137	0.95568	-3.06870	0.70597

**Table 5.8.** Independent Sample T-Test for OC8 Variable of Organizational Commitment

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
OC8 I really care about the fate of this organization.	Equal variances assumed	3.360	<b>0.068</b>	-2.325	247	<b>0.021</b>	-0.352	0.151	-0.650	-0.054
	Equal variances not assumed			-2.552	184.501	0.012	-0.352	0.138	-0.624	-0.080

**Table 5.9.** Independent Sample T-Test Group Statistics for OC8 Variable

	Position	N	Mean	Std. Deviation	Std. Error Mean
OC8 I really care about the fate of this organization.	Lower	172	<b>4.84</b>	1.177	0.090
	Higher	77	<b>5.19</b>	0.918	0.105

***H3. There are differences in the perception of job satisfaction between managers and employees.***

Independent sample t-test was conducted for testing the hypothesis and no difference found as a whole for the perception of job satisfaction between managers and employees (see Table 5.10). Further, t-test performed for each variable of job satisfaction concept and a difference was found in regard to the perception level of the attempt of manager for getting the ideas of employees about the job (JS1) (see Table 5.11).

The mean score of employees (M = 3.91) is less than that of managers (M = 4.44) (see Table 5.12). This indicates that employees do not think that their managers really care their ideas about the job as much as their managers.

**Table 5.10.** Independent Sample T-Test for Job Satisfaction Concept

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
JOB SATISFACTION	Equal variances assumed	5.582	<b>0.019</b>	-1.126	247	0.261	-1.03035	0.91477	-2.83210	0.77139
	Equal variances not assumed			-1.212	175.222	<b>0.227</b>	-1.03035	0.85036	-2.70862	0.64791

**Table 5.11.** Independent Sample T-Test for JS1 Variable of Job Satisfaction

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
JS1 My manager really tries to get my ideas about job.	Equal variances assumed	3.070	<b>0.081</b>	-2.609	247	<b>0.010</b>	-0.535	0.205	-0.938	-0.131
	Equal variances not assumed			-2.802	174.419	0.006	-0.535	0.191	-0.911	-0.158

**Table 5.12.** Independent Sample T-Test Group Statistics for JS1 Variable

	Position	N	Mean	Std. Deviation	Std. Error Mean
JS1 My manager really tries to get my ideas about job.	Lower	172	<b>3.91</b>	1.572	0.120
	Higher	77	<b>4.44</b>	1.303	0.148

***H4. Certain conceptual elements of the concept of safety climate are going to explain majority of the variance in the dependent variables of organizational commitment and job satisfaction.***

A regression analysis for organizational commitment as dependent variable was performed and the result indicated a moderate support for the hypothesis. The variables of SC12 (availability of regular job safety meetings), SC8 (concern about one’s general welfare), SC14 (availability of proper equipment), SC2 (concern about worker’s safety), and SC17 (likeliness of injury) explained almost 48 percent of the variance in the dependent variable of organizational commitment at a highly significant level as shown in Table 5.13.

Durbin-Watson test indicates that regression model is not a result of auto-correlation and confirms that this result does not occur by chance. Thus, it indicates the validity of outcome. F value also indicates the significance of regression model at a high significance level ( $p = .011$ ).

**Table 5.13.** Regression Analysis for Organizational Commitment  
(Predictor: Safety Climate)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
					1	0.545 <sup>a</sup>	0.297	0.294	6.08729	
2	0.648 <sup>b</sup>	0.420	0.416	5.53994	0.123	52.219	1	246	0.000	
3	0.670 <sup>c</sup>	0.449	0.442	5.41134	0.029	12.831	1	245	0.000	
4	0.682 <sup>d</sup>	0.465	0.456	5.34258	0.016	7.347	1	244	0.007	
5	0.692 <sup>e</sup>	0.479	0.469	5.28288	0.014	6.546	1	243	0.011	

- a. Predictors: (Constant), SC12
- b. Predictors: (Constant), SC12, SC8
- c. Predictors: (Constant), SC12, SC8, SC14
- d. Predictors: (Constant), SC12, SC8, SC14, SC2
- e. Predictors: (Constant), SC12, SC8, SC14, SC2, SC17
- f. Dependent Variable: Organizational Commitment

The contribution of the variables for explaining the organizational commitment in terms of regression analysis is shown in Table 5.14 with beta coefficient and t-test values.

**Table 5.14.** Beta Coefficient and T-Test Values for Organizational Commitment  
(Predictor: Safety Climate)

Variable	$\beta$	t	p
SC12	.263	4.623	0.000
SC8	.294	5.500	0.000
SC14	.180	3.466	0.001
SC2	.145	2.641	0.009
SC17	.124	2.559	0.011

Another regression analysis was also performed using job satisfaction as dependent variable was also performed and the result indicated a moderate support for the hypothesis.

The variables of SC8 (concern about one’s general welfare by management), SC14 (availability of proper equipment), SC3 (how serious the safety is taken in the organization), SC6 (relation between safety rules and production targets), and SC12 (availability of regular job safety meetings) explained almost 31 percent of the variance in the dependent variable of job satisfaction at a highly significant level as shown in Table 5.15.

Durbin-Watson test also confirms that this result does not occur by chance. F value also indicates the significance of regression model at a high significance level ( $p = .03$ ).

**Table 5.15.** Regression Analysis for Job Satisfaction (Predictor: Safety Climate)

<b>Model Summary<sup>f</sup></b>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.412 <sup>a</sup>	0.170	0.166	6.09447	0.170	50.504	1	247	0.000	
2	0.498 <sup>b</sup>	0.248	0.242	5.81020	0.079	25.761	1	246	0.000	
3	0.530 <sup>c</sup>	0.281	0.272	5.69604	0.032	10.959	1	245	0.001	
4	0.547 <sup>d</sup>	0.300	0.288	5.63190	0.019	6.612	1	244	0.011	
5	0.560 <sup>e</sup>	0.313	0.299	5.58899	0.013	4.761	1	243	0.030	2.207

- a. Predictors: (Constant), SC8
- b. Predictors: (Constant), SC8, SC14
- c. Predictors: (Constant), SC8, SC14, SC3
- d. Predictors: (Constant), SC8, SC14, SC3, SC6
- e. Predictors: (Constant), SC8, SC14, SC3, SC6, SC12
- f. Dependent Variable: Job Satisfaction

The contribution of the variables for explaining the job satisfaction in terms of regression analysis is shown in Table 5.16 with beta coefficient and t-test values.

**Table 5.16.** Beta Coefficient and T-Test Values for Job Satisfaction  
(Predictor: Safety Climate)

Variable	$\beta$	t	p
SC8	.249	4.263	0.000
SC14	.214	3.537	0.000
SC3	.156	2.629	0.009
SC6	.136	2.556	0.011
SC12	.138	2.182	0.030

*H5. There are significant relationships between safety climate dimensions and perceived level of job satisfaction and organizational commitment.*

Pearson's correlation coefficients which represent a measure of linear association were calculated in order to measure how variables are related. As seen in the Table 5.17, there are significant relations between the three variables:

**Table 5.17.** Correlation Matrix for the Three Key Concepts

		Safety Climate	Organizational Commitment	Job Satisfaction
<b>Safety Climate</b>	Pearson Correlation	1	.599**	.480**
	Sig. (2-tailed)		.000	.000
	N	249	249	249
<b>Organizational Commitment</b>	Pearson Correlation	.599**	1	.722**
	Sig. (2-tailed)	.000		.000
	N	249	249	249
<b>Job Satisfaction</b>	Pearson Correlation	.480**	.722**	1
	Sig. (2-tailed)	.000	.000	
	N	249	249	249

\*\* Correlation is significant at the 0.01 level (2-tailed).

- Safety climate and organizational commitment variables are positively correlated (.599) and the correlation is significant at the 0.01 level.
- Safety climate and job satisfaction variables are positively correlated (.480) and the correlation is significant at the 0.01 level.
- Organizational commitment and job satisfaction variables are positively correlated (.722) and the correlation is significant at the 0.01 level.

***H6. Certain conceptual dimensions of satisfaction with job/work, supervisor, and co-workers will account for the greater amount of the variance in the dependent variable of organizational commitment.***

A regression analysis for organizational commitment as dependent variable was performed and the result supported the hypothesis. The variables of JS2 (living up his/her promises by manager), JS3 (sense of accomplishment), JS5 (satisfaction level of job), JS1 (importance of one's ideas about job), and JS6 (feeling doing something worthwhile in the job) explained almost 59 percent of the variance in the dependent variable of organizational commitment at a highly significant level as shown in Table 5.18. Durbin-Watson test confirms that this result does not occur by chance. F value also indicates the significance of regression model at a high significance level ( $p = .007$ ).

The contribution of the variables for explaining the organizational commitment in terms of regression analysis is shown in Table 5.19 with beta coefficient and t-test values.

**Table 5.18.** Regression Analysis for Organizational Commitment (Predictor: Job Satisfaction)

<b>Model Summary<sup>f</sup></b>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.642 <sup>a</sup>	0.412	0.410	5.56581	0.412	173.385	1	247	0.000	
2	0.724 <sup>b</sup>	0.524	0.520	5.02160	0.111	57.438	1	246	0.000	
3	0.750 <sup>c</sup>	0.563	0.557	4.82183	0.039	21.806	1	245	0.000	
4	0.761 <sup>d</sup>	0.580	0.573	4.73606	0.017	9.954	1	244	0.002	
5	0.770 <sup>e</sup>	0.592	0.584	4.67491	0.012	7.426	1	243	0.007	1.669

a. Predictors: (Constant), JS2

b. Predictors: (Constant), JS2, JS3

c. Predictors: (Constant), JS2, JS3, JS5

d. Predictors: (Constant), JS2, JS3, JS5, JS1

e. Predictors: (Constant), JS2, JS3, JS5, JS1, JS6

f. Dependent Variable: Organizational Commitment

**Table 5.19.** Beta Coefficient and T-Test Values for Organizational Commitment (Predictor: Job Satisfaction)

Variable	$\beta$	t	p
JS2	.287	4.452	0.000
JS3	.189	3.252	0.001
JS5	.174	3.307	0.001
JS1	.226	3.462	0.001
JS6	.137	2.725	0.007

**H7.** *There are differences in the perceived level of safety climate depending on employees' level of experience.*

Anova test employed indicated that there was difference between group of workers having  $0 < x \leq 1$  years experience and group of workers having  $3 \leq x < 5$  years experience in terms of perceived level of safety climate shown in Table 5.20.

The mean of group of workers having  $3 \leq x < 5$  years experience ( $M = 76.09$ ) is greater than that of group of workers having  $0 < x \leq 1$  years experience ( $M = 70.26$ ).

No other differences were found.

**Table 5.20.** Anova Test Results for Safety Climate in Terms of Experience Level

**Multiple Comparisons**

Dependent Variable: Safety Climate  
Scheffe

(I) Years Experience	(J) Years Experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<b>0 &lt; x ≤ 1</b>	1 < x < 3	-.65498	1.52922	.980	-4.9599	3.6499
	<b>3 ≤ x &lt; 5</b>	<b>-5.83496*</b>	1.77489	.014	-10.8314	-.8385
	5 and more	-4.71868	1.77489	.072	-9.7152	.2778
1 < x < 3	0 < x ≤ 1	.65498	1.52922	.980	-3.6499	4.9599
	3 ≤ x < 5	-5.17998	1.86994	.056	-10.4440	.0841
	5 and more	-4.06370	1.86994	.196	-9.3278	1.2004
<b>3 ≤ x &lt; 5</b>	<b>0 &lt; x ≤ 1</b>	<b>5.83496*</b>	1.77489	.014	.8385	10.8314
	1 < x < 3	5.17998	1.86994	.056	-.0841	10.4440
	5 and more	1.11628	2.07567	.962	-4.7269	6.9595
5 and more	0 < x ≤ 1	4.71868	1.77489	.072	-.2778	9.7152
	1 < x < 3	4.06370	1.86994	.196	-1.2004	9.3278
	3 ≤ x < 5	-1.11628	2.07567	.962	-6.9595	4.7269

\* The mean difference is significant at the .05 level.

The results indicated that workers having  $3 \leq x < 5$  years experience ( $M = 76.09$ ) perceive safety climate more positive than that of workers having  $0 < x \leq 1$  years experience ( $M = 70.26$ ).

Further t-tests were made for understanding differences by age and educational level in regard to the variables of job satisfaction and organizational commitment; and by age in regard to the variable of safety climate, but no significant results were obtained. Because female workers were very few in the shipbuilding sector, differences by gender were not observed.

## **6. CONCLUSION & DISCUSSION**

Since the safety deficiency at shipyards in Turkey is a growing matter due to developing shipbuilding industry, it is clear that making academic research for understanding the main reasons of safety problems from the perspective of both managers and employees is very essential. In this research, two of the work-related employee attitudes, namely, organizational commitment and job satisfaction were also evaluated, and the relations between the three key concepts of this research, namely, safety climate, organizational commitment, and job satisfaction, were examined.

Positions of the respondents were classified as managers (upper level workers) that have university and higher education, and employees (lower level workers/heavy workers) that have high school and lower education. In addition, the term, “worker”, is used for both managers and employees in this research. The reason for this kind of classification is the difficulty in grouping the respondents.

In this research, it was seen that the education level of the workers in the surveyed shipyards is very low: 24.9% of the workers are graduated from primary school and 14.5% of the workers are graduated from secondary school which totally equal to almost 40% of the whole workers at the surveyed shipyards. These workers are the ones mostly working in heavy works and thus, facing more frequently with injuries and accidents. Only 29.7% of the workers are graduated from high school where this education level is considered relatively acceptable in shipbuilding sector. They are all mostly working at the site, not in the buildings at shipyard.

The demographic information also showed that 37.5% of the workers have an experience up to only one year at the same shipyard. This situation shows that there is a high turnover at shipyards which prevents the understanding and adoption of the organization's safety climate, formation of organizational commitment, and feeling job satisfaction. One of the main reasons of this high turnover is subcontracting system. During my interviews with the managers from different levels at shipyards, they explained that 75% of the workers at shipyards, on average, are employed by subcontractors, not directly by shipyards. For further researches, employer as a subcontractor and shipyard should also be evaluated in order to reveal the similarities and differences in workers' perception of safety climate, organizational commitment, and job satisfaction.

Safety climate dimensions found in the analyses are consistent with the theoretical articles and the outcomes of studies of Brown and Holmes (1986), Dedobbeleer and Beland (1991), and Clarke (2006). Outcomes of the analyses showed that safety climate is a function of management commitment/concern for safety representing the workers' perception of management's attitude toward safety implementations and workers' safety, and attitude toward unsafe task (Clarke, 2006); worker's involvement/response to safety representing the presence of regular safety meetings, perceived likelihood of injuries, availability of proper equipment and safety instructions (Dedobbeleer & Beland, 1991); and conflict between production and safety representing the perceived pressure to put production before safety measures (Clarke, 2006), and risk perception at work (Dedobbeleer & Beland, 1991).

The study of Prussia, Brown, and Willis (2003) had found differences in safety issues between managers and employees. Contrary to the expectation, no difference was found in the perception of safety climate, organizational commitment, and job satisfaction between managers (upper level workers) and employees (lower level workers) as a whole, i.e., considering the scales of each key concepts (safety climate, organizational commitment, and job satisfaction) including all elements for each separate scale in this research. These results may arise from the increasing safety measures and repeating education about safety at shipyards as result of the government and media pressure due to increasing deaths and injuries for the last years. In line with these developments at shipyards, some of the respondents may have chosen more positive answers for the future of their shipyard and themselves. Therefore, for further researches, timing for survey application will be a very important decision.

On the other hand, when the elements of safety climate questionnaire were tested separately, it was found that employees feel more independent than managers to refuse to work if they feel the task is unsafe and also, managers perceive the likelihood of injuries more than that of employees; when the elements of organizational commitment questionnaire were tested separately, it was found that employees care about the fate of the organization less than that of managers; and when the items of job satisfaction questionnaire were tested separately, it was found that employees do not think that their managers really care their ideas about the job as much as their managers.

As a result of hypothesis testing, it was found that some elements, which assess availability of regular job safety meetings, concern about one's general welfare, availability of proper

equipment, concern about worker's safety, and likeliness of injury, of the safety climate scale explained almost 48 percent of the variance in the dependent variable of organizational commitment at a highly significant level. This result shows that if the workers feel and see the concern and support of the management about supplying safe working conditions, their commitment to the shipyard increases.

Another hypothesis testing showed that some elements, which assess concern about one's general welfare by management, availability of proper equipment, how serious the safety is taken in the organization, relation between safety rules and production targets, and availability of regular job safety meetings, of the safety climate scale explained almost 31 percent of the variance in the dependent variable of job satisfaction at a highly significant level. This result indicates that if the workers feel and see the concern and support of the management about providing and sustaining safe working conditions, and also, if the management gives reasonable and reachable production targets which will result in not breaking the safety rules due to pressure for production, their job satisfaction increases.

Previous studies indicated that there are significant associations between low job satisfaction and high accident involvement (Holcum, Lehman, & Simpson, 1993; Lee, 1998), between safety culture and satisfaction with work, and between safety culture and organizational commitment (Morrow & Crum, 1998). The outcomes of this research showed that safety climate, organizational commitment, and job satisfaction are positively correlated with each other.

When the relation between organizational commitment and job satisfaction was analyzed, it was seen that some elements, which assess living up his/her promises by manager, sense of accomplishment, satisfaction level of job, importance of one's ideas about job, and feeling doing something worthwhile in the job, of the job satisfaction explained almost 59 percent of the variance in the dependent variable of organizational commitment at highly significant level which is supported by the numerous researches (McCormick & Ilgen, 1988; Brown & Peterson, 1993; Hartmann & Bambacas, 2000; Boles et al., 2007). This result shows that when the workers feel that their ideas about the job are important for the management, the management keeps its promises, and the workers feel a sense of achievement in their job, and believes their job is satisfying and worthwhile, the level of their organizational commitment increases.

Results of the hypothesis testing also indicated that workers having 3-5 years work experience perceives safety climate at the shipyard more positively than that of workers having 0-1 years work experience. This result shows that when experience at a shipyard increases the worker's perception of safety climate at the shipyard also increases.

## **6.1. Ramification for Further Researches & Practitions**

### **For practitioners:**

- In order to obtain positive safety climate at shipyards, management should show more commitment/concern for safety by supplying and sustaining safe working conditions; worker's involvement/response to safety should be developed by

sustaining regular safety meetings and providing proper equipment and safety instructions; and conflict between production and safety should be reconsidered cautiously by shipyard managements, and reasonable and reachable production targets should be created.

- 75% of the workers at shipyards, on average, are employed by subcontractors, not directly by shipyards. This situation results in high turnover which prevents the understanding and adoption of the shipyard's safety climate, formation of organizational commitment, and feeling job satisfaction. Because safety climate, organizational commitment, and job satisfaction positively affect each other, shipyard owners should consider direct employment of workers or if they work with the workers of subcontractors, they should establish a long-lasting relationship and manage the occupational health and safety management system more efficiently.
- Because the safety and occupational trainings realized so far show positive influences on safety climate, both shipyard owners and subcontractors should sustain and develop these trainings together in order to turn negative attitudes into positive behaviors.

**For researches:**

- Employer should also be evaluated as shipyard owner and subcontractor.
- Because the education level of the workers is very low in shipbuilding sector, number of the items in the scales should be decreased; simpler and shorter

sentences should be made; and/or instead of six-point Likert scale, five- or four-point Likert scales should be considered if possible.

- Sample size should be larger in order to make meaningful generalizations. During the survey application period of the research, most of the shipyards did not accept the survey application due to the public and media pressure resulting from the serious accidents and injuries happened at the time of survey.
- Risk perception by managers and employees should be evaluated.
- Timing for survey application should be chosen very cautiously.

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## **APPENDICES**

## APPENDIX A: IMAGES FROM SHIPYARDS



**Figure A.1.** Tuzla Shipyards Region (Deniz Haber Ajansı, 2008)



**Figure A.2.** Unspecified Safe Vehicle Ways (TMLSS, 2007)



**Figure A.3.** Damaged Electric Cables over Wet Floor (TMLSS, 2007)



**Figure A.4.** Disorganized and Untidy Workplace (TMLSS, 2007)



**Figure A.5.** Lack of Culture of Protection (Deniz Haber Ajansı, 2008)

## APPENDIX B: SAFETY CLIMATE SCALE

- SC1. There is a good attitude to safety at this plant.
- SC2. Management is genuinely concerned about workers' safety.
- SC3. Safety is taken seriously at this plant.
- SC4. The standards for safety are very high at my place of work.
- SC5. Instructions on safety implementations and rules are given to the employees before starting to work at this plant.
- SC6. Rules relating to personal safety sometimes make it difficult to keep up with production targets.
- SC7. People at this plant refuse to work if they feel the task is unsafe.
- SC8. I feel that the management at this plant is concerned about my general welfare.
- SC9. People are reluctant to report accidents at this plant.
- SC10. The rules do not always describe the safest way of working.
- SC11. There is sometimes pressure to put production before safety at this plant.
- SC12. Regular job safety meetings are carried out at this plant.
- SC13. I myself control what happens to my safety on the job, it does not depends on luck.
- SC14. The proper equipment for performing my tasks is available at my job site.
- SC15. Sometimes, it is necessary to ignore safety regulations to keep production going.
- SC16. Taking risks is part of my job.
- SC17. I think that the likeliness of injury on the job is high within the next year.

## **APPENDIX C: AFFECTIVE ORGANIZATIONAL COMMITMENT SCALE**

- OC1. I put in a great deal of effort beyond that expected in order to help this organization be successful.
- OC2. I talk up my organization to my friends as a great organization to work for.
- OC3. I would accept almost any type of job assignment in order to keep working for this organization.
- OC4. I find that my values and the organization's values are very similar.
- OC5. I am proud to tell others that I am part of this organization.
- OC6. I feel that this organization really inspires the very best in me in the way of job performance.
- OC7. I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.
- OC8. I really care about the fate of this organization.
- OC9. I feel that this is the best of all possible organizations for which to work.

## **APPENDIX D: JOB SATISFACTION SCALE**

### **Satisfaction with Supervisor**

- JS1. My manager really tries to get my ideas about job.
- JS2. My manager lives up to his/her promises.

### **Satisfaction with Job**

- JS3. My job gives me a sense of accomplishment.
- JS4. My job is exciting.
- JS5. My job is satisfying.
- JS6. I believe that I am really doing something worthwhile in my job.

### **Satisfaction with Coworkers**

- JS7. My fellow workers are not helpful to each other in general.
- JS8. The people I work with are very friendly to me.

# VITAE OF ÖZGE ALTINEL

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## EDUCATION

B.S. in Environmental Engineering, 2002. Faculty of Engineering, Marmara University, Istanbul, Turkey.

## EMPLOYMENT HISTORY

- Environmental Engineer  
HSE Responsible**      **Aug 2007 – Current**  
I am responsible for the establishment and implementation of Occupational Health and Safety, and Environmental Management Systems at **Aras Salvage & Marine Construction Trading Co. Ltd. (İstanbul / Turkey)**.
- Financial Advisor**      **Feb 2004 – Aug 2004**  
I worked as a Financial Advisor in Private Clients Division of **Aviva Hayat ve Emeklilik AŞ (İstanbul / Turkey)**. My responsibilities were marketing and sales of life insurance and private pension products advising the best financial planning for individuals by analyzing their long-term protection and investment needs.
- Freelance Translator**      **Dec 2002 – Aug 2003**  
I worked as a freelance translator for **Türk Henkel AŞ (İstanbul / Turkey)**. I translated Material Safety Data Sheets, Technical Information Sheets, Application and Handling Directives, and Product Information Sheets.
- Freelance Translator**      **Dec 2002 – Apr 2003**  
I worked as a freelance translator for **Cognis Kimya AŞ (İstanbul / Turkey)**. I translated SHE (Safety, Health, and Environment) Bulletins.
- Designer**      **Feb 2002 – Dec 2002**  
I took part of architectural projects including the AutoCAD drawings of apartment buildings and villas as a designer in an architecture office **(İstanbul / Turkey)**.
- Freelance Translator**      **Jan 2000 – Dec 2000**  
I worked as a freelance translator for **Türk Henkel AŞ (İstanbul / Turkey)**. I translated Material Safety Data Sheets.

## TRAININGS

- Jan 2002 – Feb 2002, Cognis Kimya AŞ, Kocaeli / Turkey**  
I worked as a trainee in Environment Department for four weeks. I joined Environmental Management System (EMS) trainings and I got an opportunity to study and to observe waste management, EMS communication, and documentation, in addition to ISO 14001 Management.
- Aug 2000 – Aug 2000, Mercedes-Benz Türk (MBT) AŞ, İstanbul / Turkey**  
I worked as a trainee in Environmental Department of Hoşdere Plant for a month. In MBT, I got a chance to study and to observe ISO 14001 EMS works and organization, waste management, EMS communication and documentation, how the wastewater treatment plant works and laboratory analyses.
- Aug 1998 – Sept 1998, Kırklareli Drinking Water Treatment Plant, Kırklareli / Turkey**  
I worked as a trainee in the plant and in the laboratory for four weeks.