ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE ENGINEERING AND TECHNOLOGY

APPLICATION OF EFQM EXCELLENCE MODEL TO TURKISH SHIP RECYCLING INDUSTRY

M.Sc. THESIS

Çağatay KANDEMİR

Department of Maritime Transportation Engineering

Maritime Transportation Engineering Programme

JANUARY 2015

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE ENGINEERING AND TECHNOLOGY

APPLICATION OF EFQM EXCELLENCE MODEL TO TURKISH SHIP RECYCLING INDUSTRY

M.Sc. THESIS

Çağatay KANDEMİR
(512121017)

Department of Maritime Transportation Engineering

Maritime Transportation Engineering Programme

Thesis Advisor : Assoc. Prof. Dr. Metin ÇELİK

JANUARY 2015

İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ

EFQM KALİTE MÜKEMMELİYET MODELİNİN TÜRK GEMİ GERİ DÖNÜŞÜM ENDÜSTRİSİNE UYGULANMASI

YÜKSEK LİSANS TEZİ

Çağatay KANDEMİR
(512121017)

Deniz Ulaştırma Mühendisliği Anabilim Dalı

Deniz Ulaştırma Mühendisliği Programı

Tez Danışmanı : Doç. Dr. Metin ÇELİK

OCAK 2015

Çağatay KANDEMİR, a M.Sc Student of ITU **Institute of Science and Technology/Graduate School of Istanbul Technical University student** ID 512121017, succesfully defended the **thesis** entitled **"APPLICATION OF EFQM EXCELLENCE MODEL TO TURKISH SHIP RECYCLING INDUSTRY"**, which he prepared after fulfiling the requirements specified in the associated legislations, before the jury whose signatures are below.

Thesis Advisor :	**Assoc. Prof. Dr. Metin ÇELİK** Istanbul Technical University	.....
Jury Members :	**Prof. Dr. Süleyman ÖZKAYNAK** Piri Reis University	.....
	Asst. Prof. Dr. Münip BAŞ Istanbul Technical University	.....

Date of Submission : 15.12.2014
Date of Defense : 20.01.2015

FOREWORD

In this study, I would like to express my gratitude to my thesis supervisor, Assoc. Prof. Dr. Metin ÇELİK for his continuous encouragement, guidance, helpful critics and discussions in my studies.

I would like to give my special thanks to Assoc. Prof. Dr. Özcan ARSLAN for his supportive efforts in my thesis.

I would like to give my special thanks to Mr. İlker MEŞE for his helpful manner, which is very important to me.

I would also like to thank to Dr. Onur Sabri DURAK for his beneficial discussions and encouragement.

January 2015

Çağatay Kandemir
(Naval Architecture and Marine Engineer)

TABLE OF CONTENTS

Page

ABBREVIATIONS

EU	**:** The European Union
UK	**:** The United Kingdom
IMO	**:** The International Maritime Organization
ILO	**:** The International Labour Organization
MEPC	**:** The Maritime Environment Protection Committee
HK Convention	**:** The Hong Kong International Convention
NGO	**:** Non-Governmental Organization
PCB	**:** Polychlorinated biphenyls
EFQM	**:** European Foundation for Quality Management
TQM	**:** Total Quality Management
LDT	**:** Light Displacement Tonnage

LIST OF TABLES

Page

LIST OF FIGURES

Page

APPLICATION OF EFQM MODEL TO TURKISH SHIP RECYCLING INDUSTRY

SUMMARY

Ship recycling is known as a “green industry” due to its contributions to the global conservation of resources. Five main countries in the world conduct more than 95% of the world’s total ship recycling volume (India, Bangladesh, China, Pakistan and Turkey). For some nations, the recycled materials play an essential role in their local and national economy. Besides, the ship recycling provides many job opportunities in the related countries as a labour-intensive industry.

However, ship recycling struggles with many challenges mostly about the environment and human health issues, especially in South Asian ship recycling nations. Common use of the beaching method is the biggest factor, which lowers the standards of the working conditions and capability of the environment friendly movements . Apart from the environmental impact of toxic substances that originated from the obsolete vessels, they are mixed with the beach sand in the ship-recycling zone, which is also the workplace for employees. In addition to this, asbestos is a major threat for employees’ health, as they could be exposed to it during unsafe operations. Heretofore, there are mounting evidences indicate that ship recycling have not been carried out properly most of its operations despite the efforts of international bodies such as International Maritime Organizaton (IMO) and International Labour Organization (ILO). The most noticeable effort stands as the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, which has been adopted by IMO in 2009. The intention is regularizing the industry comprehensively as a main instrument. However, the Convention has not entried into force yet.

Turkey and China are known as two promising ship recycling nations when it comes to environmentally sound operations and relatively high working conditions. Turkey is also the most steel scrap importing country in the world by a very big margin. For that reason, the importance of ship recycling for Turkey is considerably high due to gaining cheaper steel scrap for the economy. Nevertheless, Turkish ship recycling industry has its own problems that pending to be resolved. For that reason, the European Foundation for Quality Management (EFQM) has been applied to Turkish ship recycling industry in order to measure current situation of the industry, reveal the weak and strong points, and suggest improvements to reach sustainable development. The EFQM has been applied through a ship-recycling-adapted field survey that responded by academic and industrial perspectives, elaborately. Responses are analyzed with RADAR logic and findings are demonstrated transparently. According to criterions of the EFQM, the weakest points of the industry are found as follows respectively; leadership, society results, strategy, and processes, while the strongest points are respectively; people results and people.

EFQM KALİTE MÜKEMMELLİYET MODELİNİN TÜRK GEMİ GERİ DÖNÜŞÜM ENDÜSTRİSİNE UYGULANMASI

ÖZET

Kullanım dışı kalan ve atık olarak adlandırılan materyallerin çeşitli yöntemlerle yeniden imalat sürecine kazandırılması işlemine "geri dönüşüm" denir. Dünya üzerinde gittikçe artmakta olan insan nüfusu ve ona bağlı olarak artan tüketim miktarı, gezegenimizin doğal dengesini olumsuz yönde etkilemektedir. Doğal kaynakların israfının önlenmesi ve enerji sarfiyatının azaltılması geri dönüşüm endüstrisi sayesinde mümkün olabilmektedir. Ayrıca, doğal kaynakların hammadde olarak eldesi sırasında ortaya çıkan envai çeşit çevreye zararlı maddelerin doğaya salınımı da büyük ölçüde engellenmektedir. Bu durum, en yaygın endüstriyel hammaddelerden olan "çelik" üzerinden bir örnek ile ifade edilecek olursa, 1 ton çeliği cevherlerden elde etmek için 7400 MJ civarında bir enerji miktarı sarf edilirken, yine aynı miktardaki çeliği geri dönüşümden elde etmek için sadece 1350 MJ civarında enerji harcanmaktadır. Bunun yanı sıra, 1 ton çeliğin doğal kaynaklardan eldesi sırasında 2200 kg civarı karbondioksit salınımı yapılırken, geri dönüşüm sırasında yalnızca 280 kg civarı bir salınım yapılmaktadır. Yani, geri dönüşümsüz üretim, enerji sarfiyatında beş kattan daha fazla bir miktarda tüketime yol açarken, çevreyi de yaklaşık dokuz kat daha fazla kirletmiş olur.

Gemilerin geri dönüşümü, diğer geri dönüşüm faaliyetleri gibi çevre dostu bir endüstri olarak nitelendirilmektedir. Bir geminin tamamının yaklaşık %95'i geri dönüştürülebilir. Bunun yanında gemi geri dönüşüm endüstrisi, gerek bölgesel çapta, gerekse ülkesel çapta ekonomilere önemli katkılar sağlar. Yoğun emek gücüne ihtiyaç duyduğundan istihdama katkıda bulunur, bununla birlikte; elde edilen çelik hurdaların ekonomiye katkısı önemlidir. Dünyada gemi geri dönüşümünü ciddi anlamda gerçekleştiren beş ülke bulunmaktadır. Bunlar; Hindistan, Bangladeş, Çin, Pakistan ve Türkiye'dir. Bu ülkeler toplam gemi geri dönüşüm hacminin %95'inden fazlasını gerçekleştirmektedirler.
Genel olarak "beaching" adı verilen bir yöntem kullanılarak gemiler söküme başlanmaktadır. "Beaching"; ucuz, insan gücüne dayalı, iş emniyeti açısından zafiyetleri olan bir metottur. Bunun yanında, çevrecilik ve insan sağlığı söz konusu olduğunda, çok kısıtlı bir hareket alanına izin verebilmektedir. Özellikle Güney Asya ülkelerinde (Hindistan, Bangladeş ve Pakistan) bu metotun kullanımı ile kuruluşların iş emniyetindeki sorumsuz davranışları birleşerek pek çok ölümlü iş kazasına sebebiyet vermiştir.

Ayrıca gemilerin sökümü sırasında, aynı zamanda işçilerin çalışma alanı olarak kullandığı toprağa ve denize dökülen toksik atıklar hem çevreye, hem de insan sağlığına halen zarar vermektedir. Bunun yanında, söküm işlemi gerçekleştirilecek olan geminin asbestten arınması için gereken temizlik tam anlamıyla yapılmadığı takdirde, çalışanların asbest kaynaklı hastalıklara yakalanma riski de artmaktadır. Geçmişte bunun da pek çok örneği görülmüştür. Bu kötü durum belli bir süre bu şekilde seyretmiş ve belli bir noktadan sonra toplumsal farkındalık yükselmiştir. Bunun sonucunda bazı sivil toplum örgütlerinin harekete geçmesiyle, uluslar arası organizasyonların ve bu konuyla ilgili diğer düzenleyici kuruluşların harekete geçmesi sağlanmıştır. Yine de ortaya konulan düzenlemeler yeterince etkili olamamış, operasyonel olarak beklenildiği kadar bir ilerleme kaydedilememiştir. Bunun sonucu olarak, en son, 2009 yılında Uluslar arası Denizcilik Örgütü (IMO) yeni bir karar almış ve Gemilerin Emniyetli ve Çevreye Duyarlı Geri Dönüşümü Hakkında Hong Kong Uluslararası Sözleşmesi'nin uygulamaya konulması kararına varılmıştır. Ancak sözleşme henüz yürürlüğe girmemiştir.

Türkiye ve Çin'de durum nispeten daha iyi olsa da, gemi geri dönüşüm endüstrisinin karakteristik problemleri bu endüstriyi barındıran tüm ülkelerde görülmektedir. Gemi sökümünün ya da gemi geri dönüşümünün Türkiye için önemi büyüktür. Bunun en büyük sebepleri arasında Türkiye'nin dünya çelik hurdası ithalatında açık ara farkla lider ülke konumunda olması gelmektedir. İzmir, Aliağa gemi sökümhanelerinde yabancı bayraklı gemilerden elde edilecek her bir ton çelik hurdanın, ülke ekonomisine katkısı milli serveti koruma adına büyük önem arz etmektedir. Ayrıca Türkiye, coğrafik konum olarak, diğer Asya ülkelerine oranla daha şanslı bir durumdadır. Ancak, asya ülkelerindeki işçi maliyetlerinin daha düşük olması, finansal anlamda Türk gemi geri dönüşüm endüstrisi için büyük bir dezavantaj oluşturmaktadır. Armatörler tarafından gemi sökümüne gönderilmesine karar verilmiş gemiler için Türk gemi sökümcülerin önerdikleri fiyatlar Asya ülkelerinin altında kalmaktadır.

Türk gemi geri dönüşüm endüstrisinde yaşanmakta olan tüm dezavantajlar, ancak doğru bir politika ve strateji ile aşılabilir. Bunun için, öncelikle endüstriyel faaliyetleri farklı açılardan inceleyip, sorunların kök sebeplerine inebilmek gerekir. Avrupa Kalite Yönetim Vakfı'nın desteklediği EFQM kalite mükemmeliyet modeli, Türk Gemi Geri Dönüşümüne, endüstrinin hali hazırdaki sorunlarını daha iyi görebilmek, güçlü ve zayıf yanlarını ortaya çıkarmak, sürekli gelişimi sağlayarak mükemmeliyete giden yolda endüstriyi ilerletebilecek çözümler sunabilmek adına uygulanmıştır. EFQM modelinin tüm kriterlerinin, gemi geri dönüşüm sektörüne adaptasyonu sağlanılarak hazırlanmış olan sorgulayıcı saha anketi, hem geri dönüşüm konusunda kritik çalışmalara imza atmış olan akademik çevrelerin, hem de endüstride üst kademelerde bizzat görev almış olan tecrübeli uzmanların bakış açıları ve yorumlamalarıyla cevabını bulmuş, model başarıyla uygulanmıştır. Alınan bilgiler doğrultusunda yapılması gereken analizler için, RADAR mantığı yöntemi kullanılmış ve sonuçlar ayrıntılı bir biçimde incelenmiştir. EFQM modelinin her bir kriterinin sonuçları şeffaf bir şekilde açığa çıkartılıp yorumlanmıştır.

Yapılan analizlere göre, endüstrinin finansal sorunlarından kaynaklı olduğu gözlenen problemlerin yanı sıra, liderlik, toplumsal sonuçlar, strateji, ve prosesler gibi alanlarda büyük ölçüde eksiklikler görülmüştür. Devlet ve sektör arasındaki işbirliği yetersiz kalmış, kullanılan metottan kaynaklı aksaklıklar ise ayrıca kendini göstermiştir. Bunun yanında, çeşitli projeler kapsamında yürütülmüş olan, gemi söküm işçilerinin eğitimi çabaları faydalı geçse de, istenilen üst noktaya henüz ulaşılamadığı açığa çıkmıştır. Genel durum incelendiğinde, endüstri kalıcı çözümlerle ve gelişimlerle değil, günübirlik uygulamalarla ayakta kalmaktadır. Yine de, geç kalınmadan doğru adımlar atılırsa, gelecekte sektörde öncü konuma gelebilmek için hala geç kalınmış değildir. Bunun bir diğer sebebi ise, Türk gemi geri dönüşüm endüstrisinin, yeni gelecek olan uluslar arası sözleşmelere Güney Asya ülkelerinden daha hızlı ayak uydurabilecek kabiliyette olmasıdır.

1. INTRODUCTION

Simple definition of “recycling” is a process to transform waste productions into usable materials for new productions. Considering the rapid growing human population and increasing consumption; recycling in all industrial areas getting more important than ever with the purpose of keeping the limited resources of the world. Consumption of depletable resources, environmental pollution, high energy wasting and global warming is expected to abate as much as possible by means of recycling.

Without a doubt, the most recycled material on the planet is “steel”. It is at the centre of many industrial areas and it is potentially 100% recyclable (Varis, 2002). In other words, steel is theorically repoduced endlessly without loss of quality (World Steel Association, 2012). A study estimates that an amount of 7400MJ energy requires for obtaining 1 tonne of steel from hematite ore, which also causes 2200 kg of carbon dioxide releasing. As opposed, it requires 1350 MJ energy and releases 280 kg carbon dioxide when using steel scrap (Neser at al., 2008). According to an another study; energy requirements for making 1 tonne of steel from iron ore costs an amount of 23GJ energy, while making it from steel scrap costs 7GJ. In addition to this, each tonne of recycled steel saves aproximately 1,1 tonne of iron ore and 0,6 tonnes of coal. This provides a great amount of pollution reductions which 86% air pollution reduction, 76% water pollution reduction, also a 40% water usage reduction (Mikelis, 2013). It is very clear that recycling is more than three times effective when taking account only energy wasting.

Recycling of ships are another source for steel scrap production. It is recognized as “green industry” by IMO. However, “Ship recycling” is the hardest and heaviest type of recycling when compared the other industrial areas on several counts. Breaking apart an object like a “ship” is much harder than how it is theorically considered. Because of the characteristics such big, large, heavy, non-geometric and -hard to be settled- constructions require very complex processes to be dismantled.

Until 1970s, shipbreaking operations were executed with cranes and heavy equipments by large shipyards in United States and Europe. The location of the industry has shifted to docksides of Korea and Taiwan by the reason of low labor costs and low environmental standards in the 1970s. However, it did not take a long time to lose interest to ship breaking activities in these countries as they decided to use shipyards for shipbuilding. Afterwards, in the 1980s, some businesspersons enterprised to the sector in India, Pakestan and Bangladesh. Their idea is, expensive docks and tools were not necessary for breaking a ship - just drive it up onto the beach, begin to cut in by hands of workers and sell the scraps in a profitable way (Langewische, 2000). Thus, this idea has given acceleration to the ship breaking industry and sector started to gain momentum in developing countries under the leadership of South Asia. Since then, many types of large and small ships have been recycling in these nations. Today, in addition to India, Bangladesh and Pakestan; also China and Turkey executing ship breaking activities at a certain level.

From about 1990, the problematical voice of ship recycling became louder on environment and human health (Terao, 2011; Shimizu at al. 2012). However, ships contain not only various recyclable materials, but also a range of toxic and hazardous substances at the end of their life cycle (Kraus, 2005). Several types of refuse and disposable materials are being spilled from scrapped ships and usually get mixed with the beach soil and sea water during the ship breaking operations. Those materials accummulate in beach soil and become a threat to human health and environment (Islam and Hossein, 1986). So, ship recycling processes expose the workers and environment to hazardous materials such as asbestos, pcb (polychlorinated biphenyl), lead paint, mercury, fuel residue, chloroflurocarbons, hazardous chemicals, radioactives and other heavy metals like cadmium and arsenic (Schulling, 2005; Garud, 2012).

Poor working conditions also a point leading to cause occupational accidents whose consequences might be deaths and injures. As an illustrative case, two major explotions took place at the shipbreaking yard Alang (India) in 2003. Eight people died in February on a tanker and twelve people died in May on a container ship; both of them due to explotions (Schulling, 2005). Another information states that ninety workers died between the years of 2005 – 2012 just only in Chittagong, Bangladesh (YPSA, 2012). According to another information; 348 workers died between the

years of 1991 – 2007 in Alang, India (Kumar, 2011). There may be too many unknown workers died or critically injured in addition to these informations in ship recycling areas. Besides, uncertainties the information about the deaths of who suffered from occupational diseases such as lung cancer or another asbestos related disease is not clear.

Environmantal impact of shipbreaking activities draw attention to the subject and raised awareness from some sources including environmental non-governmental organizations (ENGOs) such as Greenpeace and Ship Platform. Concerned authorities started to look for a way out and decided to adopt Basel convention in 1989 (Mikelis, 2013). 1989 Basel convention remains ineffective to bring detailed rules to the recycling process. Therefore, ship recycling and its environmental impact has defined within the scope of IMO's forthcoming agenda. Various studies and efforts are recorded with the purpose of achieving an environment friendly ship recycling industry since 2003. Eventually, the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of ships was adopted in May 2009. The convention was aimed at ensuring that ships, when recycled after reaching the end of their life cycle, do not pose any unnecessary risk to human health and safety or to the environment (Chang at al., 2010). According to Hong Kong convention, ships -that comply with the requirements of the Convention- are required to have an initial survey to verify inventory of hazardous materials only by authorized ship recycling facilities (Samiotis at al., 2013). Conditions are expected to gain improvement at some level such this standards of the convention. Even so, Hong Kong Convention is not expected to enter into force before many years in most of the ship recycling countries. Problems on this subject keep continue and improvement efforts remain inoperative.

In addition to them, ship recycling industry also faces with some challenges about financial issues. There are some dominant factors in the market such as freight rates and steel market, which directly affects the offering prices for obsolete vessels and margin of profit. If freight rates increase, ship owners have less willingness to sell their ships, so offering prices are increased by ship recyclers. Ship owners tend to sell their vessels for the biggest price as possible, naturally. If ship recyclers buy an obsolete vessel from a high price, their profit margin declines. Sometimes, at the same time, steel scrap market prices go down. In such conditions, ship recyclers

make even losses and they struggle with critical financial challenges. However, Asian countries are always offer high prices for vessels when comparing to Turkey in all circumstances. The reason is, cheaper workforce and lower environmental standards in the Asian ship recycling countries. Besides, they are recycling vessels at larger amounts of tonnages than Turkey. Table 1.1 is shown the total volumes of main ship recycling countries between 2008 and 2011 and their total amounts, to have more accurated insight about the matter (Mikelis, 2013). India is the most ship recycled country according to total volumes of last four years ship recycling period. India has ten times around larger recycling experience than Turkey. One of the noticeable point is; significant increase of the total ship recycling volume in the world from 2008 to 2011.

Table 1.1: Countries' annual ship recycling volume.

	2008	**2009**	**2010**	**2011**	**TOTAL (national basis)**	**%**
Bangladesh	4,176,026	6,608,531	3,927,297	5,837,137	20,548,991	26,70
China	927,762	7,737,730	4,723,151	5,968,520	19,357,163	25,16
India	2,458,113	7,561,258	6,553,954	8,504,517	25,077,842	32,59
Pakestan	273,937	2,100,637	2,443,304	3,013,926	7,831,804	10,18
Turkey	141,351	557,251	658,473	1,067,425	2,424,500	3,15
Rest of the world	302,598	393,113	387,853	624,848	1,708,412	2,22
TOTAL	8,279,787	24,958,520	18,694,032	25,016,373	76,948,712	100

Comparisons of the ship recycling countries are also shown in the Figure 1.1 (Mikelis, 2013). According to their total ship recycling volumes, the countries will be as follows respectively, from largest to the smallest; India, Bangladesh, China, Pakestan, Turkey and rest of the world.

Turkey is the smallest ship recycling country among the top five ship recycling countries, however, the most steel scrap importer country in the world by a very big margin.

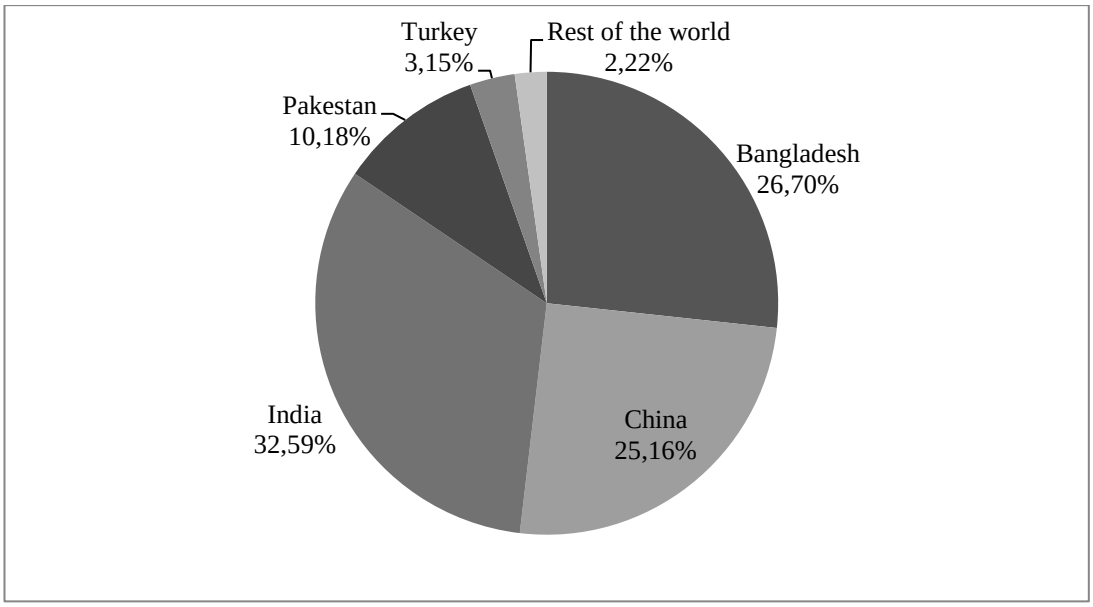

Figure 1.1: Total ship recycling volume of countries (2008 to 2011).

Table 1.2 illustrates the main steel scrap importing countries to have better understand about the subject.

Table 1.2: Main steel scrap importing countries in million tonnes (Mikelis, 2013).

	2007	**2008**	**2009**	**2010**	**2011**
Turkey	17141	17415	15665	19192	21460
Korea Rep.	6887	7319	7800	8091	8628
China	3395	3590	13692	5848	6767
India	3014	4579	5336	4643	2929
Taiwan	5418	5539	3912	5364	5328
USA	3692	3571	2986	3775	4003
EU-27	5142	4809	3270	3646	3676
Malaysia	3688	2293	1683	2292	2050
Indonesia	1260	1899	1484	1642	2157
Canada	1435	1674	1408	2226	1911
Thailand	1805	3142	1323	1282	1877

As it is known, importing materials and goods from foreign countries causes fragilities in nation's economies. Turkey is a country that already stands as one of the "fragile five" economies in the world with Brazil, India, Indonesia, South Africa (Onder at al., 2014). Thus, development of the ship recycling industry in Turkey plays an important role as a magnificent steel scrap source. Turkish ship recycling industry must be developed by sustainable and innovational technics to refrain steel scrap importing and gain economical growth.

Despite the estimations that Turkey and China are the leaders in the sense of safety and environmental standards that already meets the requirements of Hong Kong Convention (Mikelis, 2013), Neser at al. (2008) states that most of the ship breakers in Turkey pointed out their interest in being transformed to shipbuilding and ship repair.

Turkish ship recycling industry has its specific problems, such as other ship recycling industries in the world. Even so, with geopolitical position and promising facilities in the world, Aliaga ship recycling zone has big potential to reach desired level in the industry, if right steps are taken. For this, roots of the problems must be identified, weakest points and need-to-be-impoved areas must be specified elabolarately. Identified problems and other relevant issues must be improved systematicly and permanently. Shortly, the industry must target the excellence as a goal to achieve as much as possible. Hence, the EFQM excellence model has been applied to Turkish ship recycling industry in order to investigate key processes and analyze them to suggest correct improvements to remove weakest links in the chain and establish excellence. The RADAR logic has been used as a tool for demonstrating detailed analysis of the industry in a lot of ways.

2. LITERATURE REVIEW

2.1 Academic Studies

In academic studies, environmental studies are become prominent about the ship recycling. Almost all ship recycling zones have been studied and examined to reveal ship recycling's environmental impacts.

For instance, Srivanasa Reddy at al. (2003) studied systematicly in a very large ship recycling yard for three months in Alang and Sosiya (India) to quantify and classify the ship scrapping wastes. Different types of wastes were collected from different points of the coastal area. Qualitative and quantative analysis of collected solid wastes has been made and according to the results, average amount of solid waste in both regions was over 10kg/m^2 at Alang and over 15kg/m^2 at Sosiya. They classified the waste in sixteen groups such as; paper, metals, glass and ceramics, plastics, leather, textiles, wood, rubber, food waste, chemicals, paints, thermocol, sponge, ash, oil mixed waste and miscellaneous combustible and non-combustible. They found out that most of the waste was combustible so it could be used as a new energy source by gasification and incineration or another way under air pollution control measures. Besides, it would be easier to disposal the waste in an environment friendly way instead of allowing them to pollute the marine.

In the same region, (Alang-Sosiya Ship Recycling Zone, India) Srivanasa Reddy at al. (2005) investigated heavy metals, hydrocarbons and other pollutants in regard to seasonal distributions. Their study is an evidence that shows how ship recycling effects the coastal waters negatively; as values of heavy metals and hydrocarbons were significantly higher than the reference station. Concentrations reached their maximum values especially in the winter (December) so it may have been caused by low temperature and low tides as water was dispersed by heavy metals. Additionally, in the Monsoon period (August) heavy metal concentration is at high level which

probably caused by rain waters that coming from working yards and domestic wastes.

Demaria (2010) executed a research with using case study methodology in order to investigate the impacts of shipbreaking operations in many aspects at Alang – Sosiya (India). He gave coverage to interviews, official documents and observations to examine closely effects of the industry to the environment, shipbreaking workers, fishing communities and villagers. Besides, he took a closer look to the "Blue Lady" case and revealed the contradictions between international rules and their implementation. According to analysis of the obtained information, almost no vegetation left in the coastal beach, the population and diversity of marine species decreased, some fish species already disappeared, noise pollution raised, agricultural activities get harmed since the industry began.

Abdullah at al. (2013) observed the growth of ship breaking yards and its negative impacts to the environment by obtained various data including remote sensing systems from Sitakunda ship recycling yard (Bangladesh). Results of the observations revealed that, size of negatively impacted coastal area has increased from 367 ha to 1133 ha between 1989– 2010. Besides, in this time period; ship breaking yards expended from 3,45 km length to 12,78 km that caused a decrease of the forestland in that region. According to study natural conditions was even changing and natural order was becoming unbalanced thus, proper countermeasures needed immediately. For that reason; several recommondations has been proposed in this study which were ; establishing a ship recycling fund to beach operations led by ship owners (including pre-cleaning procedures, providing occupational incident compensation to workers, phasing to more structured methods and trained & controlled adult workforce), bringing a certification process to third-party in order to ensure uniform implementation of Basel convention, developing a pre-notification system in order to inform the authorities by companies about the vessel that intended to dispose and lastly, ensuring to provide a clean ship dismantling expertise.

Neser at al. (2008) approached the situation from the point of environment, waste management and industrial developments and problems in Turkish ship recycling sites (Aliaga, İzmir). They have taken samples at four different times from a close location to the shipbreaking sites. Mostly, seawater pollution is at a higher level than normal when it comes to take account each parameter of pollutants. They also

emphasized that Turkish ship breakers were willing to cut up ships in a green way and in this regard some developments had already made. But due to financial matters, the industry had a potential risk to be transformed into ship building or ship repairing yards which had already happened to European, South Korean and Japanese ship recycling industry in 1960s.

In the same ship recycling zone, Neser at al. (2012) conducted a study to measure contamination of heavy metals and other pollutants. They analyzed the samples that taken from Aliaga and compare the results with various coastal ecosystems. Very high contamination values reveal that samples from Aliaga were polluted with heavy metals such as Hg, Cd, Pb, Cr, Cu, Zn, Mn and Ni.

Apart from the environmental studies, human health related studies are also common in ship recycling industry. However, it must be remembered that, environmental issues and human health studies have a thin line between them, when browsing their studying technics.

Deshpande at al. (2012) put emphasis on human health issue by using a mathematical model with the purpose of estimate the potential maximum heavy metal exposure to ship recycling workers at Alang, India. According to the study, approximately 71% of workers were in the plate cutting process, which is the main part of the industrial activity. When considered the pollution values generated by plume, workers directly effected from them as well as indirectly from intertidal zone and contaminated sediments. The estimated pollution levels were much higher than the standards especially for lead (Pb).

Wu at al. (2014) adopted a 24-year retrospective study with the aim of examining increased risk of cancer among shipbreaking workers in Taiwan. An amount of 4155 male workers remained after eliminating who considered unproper to the research. Data have been obtained between 1985 and 2008 from some official organizations such as Kaohsiung's Shipbreaking Workers Union and Taiwan Cancer Registry. Asbestos related diseases, including lung cancer and mesothelioma has been observed highly in this sample group, as follows 368 cancer cases has been seen among the employees with at least 5 years of work experience and there were 347 cases among at least 10 years of work experienced ones.

An innovative pilot model project by Shimizu at al. (2012) highlighted on water jet cutting technique, which provides major advantages on preventing exploition and toxic gases generation during the operation. In this pilot model, skilled workers were used under monitoring of a supervisor to respond immediately to accidents that may occur in the ship dismantling area. With some other improvings, ship recycling process executed succesfully in compliance with Hong Kong international convention. As a conclusion, water jet cutting machines need to be developed up to a level for using it smoothly in ship dismantling, as their pressure values were around 300-400 Mpa and their main body weights around 1500- 2000kg.

Sivaprasad (2010) proposed a detailed Ship Recycling Recommender system with the intention of helping the relevant stakeholders by recommending them "best practices" idea. This knowledge-based system has built on the beaching method of ship recycling and expected to be an ever-developing expert guide through information flow between ship data and practices. The research also adopted a holistic approach to the status of ship recycling with a new ship recycling design as mentioned in the study of Sivaprasad and Nandakumar (2013). The philosophy of "design for ship recycling" handled in a very detailed way in order to safe and clean recycling of ships, so it is aimed to implement "recyclability analysis" in naval architecture and ship building. This implementation will help and give ideas and recommondations to designer such as selection of components, categorization of materials as regards to their recyclability (and other features) and preperation of recycling plan etc. By successful implemetation of this philosophy, it is expected that not only the processes of ship recycling; but also repairing, maintanence and surveying processes could performed in enhanced and sustainable way.

Knapp (2008) analyzed the ship demolition market to insight the basic dynamics with applying econometric model fed by a unique data set. Information of 51,112 ships over 100 gt and 748,621 events between 1978 and 2007 (around 29 years) has been sourced by various maritime organizations such as Lloyd's Register Fairplay, RightShip, Lloyd's Maritime Intelligence Unit, Clarkson's Shipping Intelligence Network, Chemical Distribution Institute, the Oil Companies International Marine Forum and six port state control regimes. Scrapping market of ships could be effected by many factors just as ship types, vessel age, vessel size, earnings, second hand ship prices, ship building prices and scrap prices. The study contains a

"probability of scrapping" analysis to overview the market in a comprehensive and robust way. It is clearly mentioned that "earnings" have a negative effect for "probability of scrapping" while "scrap prices" have positive. Vessel age is not a big factor but types of vessels seemed characteristic between countries. Turkey is more likely to scrap general cargo vessels, China tends to scrap container ships, Pakistan and Bangladesh scraps more tanker ships than other vessel types.

Statistical overviews on ship recycling and steel market was studied by Mikelis (2013). Market position of the top five ship recycling countries examined with an eye towards their steel productions, steel scrap imports and exports. According to the paper; world's total steel production was increasing under the leadership of China who has boosted their steel production volume from 15% to 45% of total world in the period of 2000 and 2011. Nevertheless, most of China's production based on crude steel production (not steel scrap). Another remarkable point in the study is steel scrap importing countries in the world, as Turkey is the leader by a very big margin. As follows, Turkey has imported around 21,5 million tonnes steel scrap in 2011 while Korea Republic has around 8,7 million tonnes who comes second main steel scrap importer in the world. USA was the most steel scrap exporting country in that year, and European Union was following them. In the study also, effect of freight rates and other dynamics to ship recycling market, working conditions and their effects to the environment and human health has been reviewed. After Hong Kong convention entry into force, choosing a ship recycling yard will be a matter whereas if the yard is authorized for dismantling or not. For this reason, a list of criteria has been composed for ship owners which they could consider while selecting the ship recycling facilities until the convention is activated. The study also estimates that Turkey and China are the leaders in the sense of safety and environmental standards that already meets the requirements of Hong Kong convention.

Chang at al. (2010) discussed the Hong Kong International Convention and its deficiencies from many aspects. In the study, historic background, content, structure and enforcement of the convention has been reviewed. According to the study, the Convention is beneficial to help environmentally sound and safe ship recycling activities however, it has still some dark spots to be lightened. For instance, there are deficiencies and ambiguities on waste management at the final stage of ships, which

may cause problems during operations. It is warned that, survey, inspection and reporting systems may not work as expected due to incapable global registry system. Rules about identified warships in the convention caused magnificent exclution, which may be reconsidered. Besides, the Convention does not address to ship recycling methods, as methods such as beaching are not interposed by any rules. Entry into force criteria also criticized in the study.

2.2 Research Projects

Research projects in the ship recycling are as listed below to have closer look to the matter from the point of active efforts. Finished projects results are noteable when it comes to understand ship recycling's aspects.

Recyship is a European project within the Life+ program that aimed to deal with the matters of occupational safety, health and environmental protection on ship scrapping activities. European Commission addresses the controversial subject of decontamination and recycling of ships that have reached their end of life in Europe and additionally, seeking to solve the problems on transferring them to South Asian ship recycling countries. 15 Feb. 2006 Clemenceau (French case) and 21 Feb. 2007 Otopan (Dutch case) were some of the problematic instances that the project has been influenced by. Therefore, a pilot plant will be develop toward acceleration of such these operations on European territory and prevent transferring of hazardous waste. In addition to this, it is intended to develope integrated quality management system, environmental and occupational risk prevention to related facilities in Europe and other countries. The project also has some other objectives such as contributing to reinforce European legislation on waste from ships and ships as waste, ensuring technical assistance and technological support to recyclers in EU member countries and not EU members, helping to encourage voluntary actions. The expected results from the project are; ascertaining regulational proposals in order to proper management of ships that reached their end of life, involvement of stakeholders on their needs, problems and expectations, defining the potential host environments, regularizing the processes of decontamination and dismantling of ships, bringing solutions to environmental problems, creating a feasibility plan for decontamination and dismantling, revealing project knowledge at local, national and European level,

supporting the strong spreading of Life+ program with planned activities and project results (Recyship, 2013).

ShipDismantl (Cost-Effective and Environmentally Sound Dismantling of Obsolete Vessels) was an EU project that has been conducted between 2005 and 2009 with a total budget over 2,5 million Euros. The project objectives were; developing generic guidelines including with the innovative, environmentally friendly and optimal ship recycling design, restructuring the ship recycling yards by favour of dynamic simulation software tools, developing a decision support system (DSS) to enlighten the ship breaker about the type, history, particular characteristics and reports that prepared by third parties, supporting the decision taking into account of the infrastructure competence while accepting or rejecting the vessel which will be dismantled, validation of related tools and methodologies by contribution of real case studies. Thereby, the project was expected to be an important enhancer and a guide to the ship breaking yards with its succesful implementation. Occupational safety will improve while environmental pollution will decline. To secure more sound and environmentally friendly ship recycling operations, the DSS tool will be developed for giving help to the yards in deciding to accept or reject the obsolete vessels. Participants of this project from several countries were; Indian Institute of Technology Bombay (India), Kingston Computer Consultancy Limited (UK), Leyal Turizm Insaat Mobilya Sanayi ve Ticaret Ltd. Sti. (Turkey), Medimetal Sa (Sweden), University of Patras (Greece), University of Strathclyde (UK) (ShipDismantl, 2014).

DIVEST (Dismantling of Vessels with Enhanced Safety and Technology) is a research and technology development cooperated project that funded by European Community with the total project budget of 3,4 million Euros (for a contracted level of 2,5 million Euros). A holistic approach is being implemented to the ship dismantling by favour of single, integrated and validated decision support tool database that consists of requirements and impacts from technical, economical and environmental dynamics. The project objectives will be as follows; creating validated risk and economic models that will be involved with wholeness of the ship dismantling area, making policy recommendations on the ideal dismantling facility and processes, revealing proper training programmes tested and validated onsite, creating an accessible information exchange with the related stakeholders. The project is expected to ensure core, validated and practical definition of ship

dismantling that will be accessible by all relevant stakeholders. A positive contribution also expected to business practices with better understanding of operational risks. By favour of case studies and onsite trainings the project will support the improvement on technological infrastructure, working conditions and environmental issues. The project participants are twelve partners consist of universities, research institutes and industrial players from nine different countries as they are; France, Germany, Greece, Romania, Sweden, Holland, India, Turkey and United Kingdom (DIVEST, 2014).

SHIPMATES (Ship Repair Maintain Transport which is Environmentally Sustainable) is just another project that funded by European Commission with the total budget of 3,5 million Euros (contribution of EU is around 2,2 million Euros).The project is aimed to develop strategies and processes for clean maintenance, dismantling and recycling of vehicles and vessels. The main objective of SHIPMATES project is to certify that the European repair and conversion industry is capable to increase its share of the world market. At the same time, to improve the life-cycle quality of the EU fleet while decrease pollution to the environment and to enhance energy effective industrial operations. With improvement of new methods, it is expected that a 30-40% reduction on manufacturing costs, 25% on lead time and 3-6% on costs. Additionally, an increase by 5% is expected on productivity. However, under any circumstances, 10% reduction on material costs remain as a realistic prediction. Improving on steel cutting, repairing, cable and pipework replacement in the yards also among the aims of project. Another target of the project is producing a framework and prototype tools to aid stakeholders in the relevant implementation areas. Various industrial players, universities and institutes involved closely in the project from European nations such as Greece, Italy, Poland, Portugal andUK (SHIPMATES, 2012).

Ship DIGEST (Ship Dismantling Insight by Generating Environmental and Safety Training) is a project that conducted by the leadership of European Commission under the "Lifelong Learning Programme" with the partnership of SSA (Shipbuilder & Ship Repairs Association, UK), University of Strathclyde (UK), Reciclauto Navarra Company (Spain), Swerea IFV Industrial Research Group (Sweden), Ministry of Labour and Social Security (Turkey), Aliaga Shipping and Recycling Company (Turkey), GSR Services Company (UK). Ship DIGEST project aims to

improve ship recycling industry via knowledge transfer, various identified social and HSE matters by using innovative products, tools and vocational education and training (VET) from previous EU projects and similar industries that founded in EU. Revealing the weak points of the ship dismantling workers and managements' knowledge, ensuring higher quality HSE (Health, Safety and Environment) implementation, providing perception of risk management are some of the project's aims. More reliable working conditions and professional ship recycling workers with contribution of sustainable actions are also among aims of the project. It is estimated that the competence levels of workforce conscious will be increased in a short time period by favour of VET and also it will have positive social impacts in the future. Not only the occupational conscious of workforce is expected to rise, but also environmental awareness and subsequently environmental standards are the estimated results of the project (Ship DIGEST, 2014).

Another project entitled "Determination of Concentrations, Sources, and Health Effects of Organic and Inorganic Air Pollutants in Izmir, Aliaga Industrial Region" was funded by **TUBITAK** (The Scientific and Technological Research Council of Turkey) with the purpose of determining rating, temporal and spatial variations in the concentrations of air pollutants and identifies their sources at the same time in Aliaga, Izmir. This region is the host of multiple heavy industrial activities and main ship recycling zone of Turkey. From this aspect, Aliaga has potential to be exposed by high concentrations and high emissions of pollutants. A health risk assessment, parameter analysis from measurements, a source appointment study to identify sources, and a study of health risk map conducted in the project. Therefore, all gathered information in this project was considered to merge into an air quality management plan ensured by relevant governmental organizations in the region. According to completed analysis through measured concentrations from some different stations, results of the project indicates that air pollution in the region is not as much as expected at the beginning of the project, generally. Natural gas using as energy source (instead of fossil fuels) on industrial activities is considered an important reason of this. Besides, there is no respectable clue founded which signals the ship recycling industry is caused air pollution at considerable levels in Aliaga, Izmir (Tuncel at al., 2008).

2.3 Industrial Studies

Industrial studies as national and international conventions and responsible organizations are listed below to have insight about the authorities' efforts that made until this time about ship recycling.

IMO (the International Maritime Organization) a responsible agency for the safety and security of shipping and prevention of marine pollution by ships, and specialized by United Nations (Formation: 1959). The IMO's role on the ship recycling was first raised at the 44th MEPC in March 2000 in order to investigate ship recycling activities. Then "Guidelines of Ship Recycling" was adopted at MEPC (Maritime Environment Protection Committee) in July 2003. The purpose of the guidelines was to give to stakeholders recommodations in the recycling processes (also in many other processes). Until 2009, some new rules adopted in related to design, construction and preparation of ships, safe and environmentally sound operations, and establish of proper implementation mechanism for the industry. In May 2009, IMO developed the Hong Kong International Convention for the Safe and Environmentally Sound Ship Recycling of Ships (IMO,2014).

HK Convention (The Hong Kong International Convention) is developed over three and a half years with contribution of IMO Member States, several ship recycling NGOs, ILO and the Basel Convention Parties. The aim of the convention is ensuring that ships, when being recycled after reaching their end of life cycle; do not pose any unnecessary risks to human health, safety and the environment. Asbestos, heavy metals, hydrocarbons, ozone- depleting substances and other hazardous materials are intended to address in the HK Convention. In addition to this, working conditions and environmental standards are addressed at many of the ship recycling locations in the world. 21 Articles & 25 Regulations in the convention cover the design construction, operation and preparation of ships so as to give more opportunity safe and environmentally sound ship recycling without making any concessions the safety and operational efficiency of ships. To ensure of this, establishment of appropriate enforcement mechanism for ship recycling noted in the convention with the integration of certification and reporting requirements (IMO, 2009).

When the convention entry into force, ships will be required to carry an inventory of hazardous materials that will be specific for each ship when they to be sent for recycling. Ships will be required to have an initial survey to verify the IHM (Inventory of the hazardous materials) during operational life of the ship, also as finally, when they destined to be dismantled (Article: 8, Inspection of Ships, HK Convention). Ship recycling yards will be required to provide a "Ship Recycling Plan", determine the procedure in which each ship will be recycled, depending on its characteristic particulars and its inventory. Parties will be required to take effective precautions to ensure that ship-recycling facilities under their jurisdiction comply with the HK Convention (Article 6, Authorization of Ship Recycling Facilities. HK Convention). The convention does not apply to warships, naval auxiliary, non-commercial governmental service ships, and ships less than 500GT or to ships operating their life only in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly (Article 3, Application, HK Convention). It will be prohibited or restricted to installation or use of asbestos, ozone-depleting substances, PCBs, anti fouling compounds and systems in shipyards, ship repair yards and ships of Parties to the Convention (Regulation 4, Controls of Ships' Hazardous Materials) (IMO, 2009).

The HK Convention has been adopted by member states and is in the ratification process. The convention will enter into force 24 months after the date on which not less than 15 states sign it properly. These states have to represent 40% of world merchant shipping by gross tonnage and their total maximum ship recycling volume has to be not less than 3% of their total merchant shipping tonnage. These tonnages will be determined upon during the preceding 10 years of the member states had performed (IMO, 2009).

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and came into force in 1992 in response to toxic waste trading to developing countries from abroad. In the 1980s, environmental awareness and in parallel, tightening environmental regulations in the developed nations had led some operators to seek cheaper disposal alternatives for hazardous wastes in less developed countries, where environmental awareness and regulations were substandard. Due to increasing public resistance and voices from responsible organizations, a diplomatic conference held under the UNEP (United

Nations Environment Programme) in Basel (Switzerland), where the convention was adopted. After entering into force in 1992, the convention has seen number of significant developments. The ban amendment addressed for prohibiting exports of hazardous wastes was adopted by the third meeting of the COP (Conference of the Parties) in 1995. Then Technical Working Group of the convention agreed on a lists of specific wastes that identified as hazardous or non-hazardous, was adopted in 1998. With the purpose of minimizing hazardous waste, the protocol on Liability and Compensation was adopted in 1999 to establish rules on liability and compensation for damages including incidents occurring during export, import or disposal. As a major milestone, COP 6 agreed on "Strategic Plan for the Implementation of the Basel Convention" for the period of 2002- 2010, to support the developing countries and countries in transition in implementing the provisions of the Convention to achieve environmentally sound managent of hazardous waste (BAN, 2011).

Expectations from Basel Convention for the near future are as follows; ensuring development and implementation of cleaner technologies and production methods, minoring level of hazardous waste movement, monitoring illegal traffic in order to prevent it, improving institutional and technical competency for relevant countries, providing further development activities in respect of training and technology transfer (BAN, 2011).

ILO (the International Labour Organization) is a United Nations agency devoted to elevating social justice and internationally recognized human and labour rights, encouraging decent employment opportunities, enhancing social protection and working conditions for all men and women of freedom, equity, security and human dignity. Except conventions, ILO is capable to adopt recommodations that they are not legally binding instrument and not a subject of ratification. In 2004, ILO adopted "Safety and Health in Shipbreaking: Guidelines for Asian countries and Turkey" to ensure safe work in shipbreaking and to assist shipbreakers and competent authorities in order to implement the relevant standards of ILO. These guidelines have the characteristics of recommodation (they have no enforcement) for selected Asian countries and Turkey (ILO, 2014).

Joint ILO/IMO/BC Working Group on Ship Scrapping was established by IMO in order to cooperated movement of ILO and relevant bodies of the Basel Convention on ship recycling. It is aimed to prevent duplication of work and overlapping of

actions between the three organizations, and determining the further activities. The joint group has concluded three meetings so far, and discussed the state of affairs in the ship recycling (Basel, 2011).

Eropean Union (EU) adopted a community strategy on "An EU Strategy for Better Ship Dismantling" on 19 November 2008. The strategy proposes a number of precautions to enhance ship-recycling conditions in effort to contributing the implementation of international conventions such as the HK Convention and Basel Convention. The elements of the strategy is aimed at ensuring certifications of ship recycling facilities in parallel with the conventions, encouraging voluntary industrial actions through various measures, providing technical support to developing countries on training programmes, intensifying controls in European ports in order to boost information exchange between European authorities, and the establishment of ships that ready to be scrapped (Europen Union, 2009).

The Shipbreaking Platform is a NGO and a coalition that consists of environmental, human and labour rights organizations, first founded in September 2005. The aim of the NGO platform is to prevent toxic obsolete vessels from beaching in developing ship-recycling countries. Another aim of the platform is raising a public awareness of the environmental pollution and labour rights abuses caused by ship dismantling operations in South Asia. More than a hundred NGOs around the world, the UN Special Rapporteur on Human Rights and Toxics, and the European Parliament are in support to objectives of the platform (Shipbreaking Platform, 2014).

Greenpeace is an independent global campaigning organization that present in 40 countries across Europe, North and South America, Asia, Africa and the Pasific. The organization acts for change attitude and behavior to protect environment and enhance peace by the objectives of; catalyzing energy revolution addressing the climate change, defending the oceans from destructive and wasteful actions, protecting the ancient forests and other ecologic lives of the world, working for disarmament and peace, creating a cleaned future from toxics, campaigning for sustainable agricultural activities. Greenpeace is one of the observers of IMO Working Group on ship recycling besides, one of the member organization of Shipbreaking NGO Platform since September 2005 (Greenpeace 2014).

Robin des Bois is a NGO for the protection of Human and Environment through non-violent actions, in the defense of endangered species, safeguarding of natural habitats, and the realistic and fair management of resources (Founded in 1985). The NGO publishes information bulletins and annual surveys on ship recycling regularly and draws attention to the activities that potentially dangerous to the human health or environment. Besides, Robin des Bois raises an awareness regarding to occupational accidents on maritime, ship recycling and other areas (Robin des Bois, 2014).

Friends of the Earth International (FoEI) is an international network of environmental organizations founded in 1971 by four organizations from USA, England, France and Sweden. FoEI deals with environmental, social, political and human rights issues in more than 75 countries. FoEI is one of the observers of IMO working group on ship recycling (Friends of the Earth, 2014).

According to the literature review, it is observed that, the most of the studies are about job safety and environmental issues in order to give voice to the concerning issues. However, in general, the academic studies are not comprehensive so far, they remain prepheral and uniform. Despite the many studies about ship recycling's environmental impact, there are too few studies about enhancing process technics and workflow, such as the pilot study of Shimuzu at al. (2012). There are also very few studies about interrogating the international conventions and deficiencies elaborately such as Chang at al. (2010). Research projects remain more expedient when comparing with academic studies. However, the problem is, even if the projects are ended accordingly as they had intended, they remains not actually satisfy the expectations about them. Industrial studies are also become more active in recent years, even so, they have the same problem with research projects, as they remains not effective when it comes to implementation. The biggest reason is the HK Convention, as it signals that entrying into force of the convention is still far away to be realized, despite its realistic and expedient intentions. Another reason is, even if the HK has many beneficial points, there are still some deficiencies and uncertainties in some of the rules.

The literature is not fruitful except few studies to examine the issue in many ways accordingly to the industry's aspects. Besides, practical and theorical knowledge must intersect at a point. For this reason, a comprehensive study is conducted to bring benefits to the literature with examining the matter on several counts.

3. PROPOSED APPROACH

3.1 EFQM Excellence Model

In September 1988, 14 European Business Leaders signed a “Letter of Intent” under the presidency of Jacques Delors (President of the European Commission between 1985 and 1995) to improve competition conditions of European businesses. Afterwards, the European Foundation for Quality Management was founded in October 1989 by subscription of 67 European business leaders to this action. A team of experts from industry and academia has been in charge to develop EFQM excellence model that could be applied to any organization regardless of size or sector. First implementation of this model has been made in 1992 to support the assessment of organizations in the European Quality Award. The model has evaluated with global market experiences over 25 years and from both public and private sector participated in EFQM Excellence awards including most famous and less-known organizations in the world. From past to present, these mechanisms aim to support sustainable development of economies (especially European economies) and to support organizations on their way of excellence (EFQM, 2014).

The EFQM model is a practical tool that could be use in variety of ways for organizations. It is possible to clarify the intended purposes of the model as follows; (Kalder, 2010)

- Assessing and determining the current situation of organizations in their journey to the excellence, and helping the organizations by revealing the weak and strong points so it would be easier to make decisions when determining the strategies for the future,
- Creating a common language style for disseminate the ideas to both internal and external dynamics of the organization,

- Integrating current activities with planned activities to pretend unnecessary repetitions and, identifying the actions to be taken.
- Creating a fundamental structure for organization's management system.

It is fair to say that the application of EFQM model to any industrial structure could contribute organization's total quality such these aspects. However, content of the model has been evaluated for many years and there is a large scope to review how the model works.

3.1.1 The role of the Total Quality Management model

The EFQM model is based and developed on Total Quality Management (TQM) model. The TQM model has entered the management literature after 1950s and its content has continuously developed since that date.

Development of the Total Quality management has begun with Frederick W. Taylor, as he approached to the matter scientificly for first time. He defended that responsibilities should be shared fairly between leaders and employees, and employees should be chosen and trained by scientific methods (Erol, 2003). Walter A. Shewhart developed a control cards system to monitor closely the production performance which allows to analysis quality values and working quality limits on processes (Shewhart, 1931). W. Edwards Deming has contributed to the quality matter by enhancing a sustainable mechanism to have desired quality levels in organizations. He invented the "Deming Cycle" consists of four stages and they are: "plan-do-check-act" which considered foundations of sustainable development on processes to the way of excellence (Kaufman and Zahn, 1993). According to Joseph M. Juran, definition of the quality is fitness for use in the sense of design, conformance, availability, safety, and field use. He asserted on importance of synchronized movements of quality management with other processes enhance total leadership capability in the organizations and in parallel with it, financial control also get stronger (Garvin, 1988). Philip B. Crosby also put emphasys to the links between quality management and financial control policies in organizations. He claimed that the efforts for the way going to excellent processes must be renewed continuously (Varol, 1993). Armand V. Feigenbaum featured customer focused approach on his studies and stated that improvement on total quality depends on all processes from

beginning to the end and also assessment of feedbacks from customers is an important part of development (Ersun, 1994). Genichi Takuchi is known as the mastermind of the "quality engineering" and elaborated the experimental design technics by taking advantages from statistical analysis methods. He criticisized organization's quality measuring methods and developed several design approaches especially on systems and parameters to designate the quality indicators correctly and accurately (Saat, 2000). Massaki Imai made a point of uncovering and solving hidden problems in processes which already ignored. Bringing standardizations as countermeasure factors are vital part of the ensuring and developing the quality in organizations and industries according to him. He also made significant studies on ensuring sustainable development of quality with the philosophy of "if there's no problem, it doesn't mean there is no reason for getting better" (Masaki, 1997). Kaoru Ishikawa created casual diagrams which also known as "fishbone diagram" to identify potential deficiencies that undermining the production activities by various dynamics in a working flow. Each problematic reason in the way of excellence considered as a source of variation. The reasons have been categorized as; people, materials, equipment, process, environment and management. Especially "human factor" matter has been examined with a typical approach by Ishikawa (Cafoglu, 1996).

In the light of these studies and other relevant studies, the TQM adopted eight principles on quality management. These are (Thecqi, 2014);

- Customer focused organization for being awared of current and future customer needs to meet their expectations
- Effective leadership capabilities to ensure that people in the organization are at the right direction and they are serving to a common organizational purpose
- Fully involvement of people and effective use of their abilities
- Efficient design of processes to achieve desired results

- System approach for management to measure effectiveness of specific objects in working flow
- Continual improvement is indispensable for an organization to attain continous quality
- Factual approach to design making to decide effectively in consideration of logical analysis
- Mutually beneficial supplier relationships to contribute on creating value

True and realistic application of TQM model will increase organization's competitiveness, bring a professional approach on long term planning, establish a comfortable working environment that everyone can succeed without unnecessary frictions, create working teams, partnerships and co-operation to achieve targets in a given time period. If an organization has a formal management system, it will be very easy to apply TQM model into the organization at any time. In time, working philosophy, working culture and manner of work will change and operation of system will be more effective, permanently.

When an organization adopts TQM model, changes and differences in its concept will be in the table 3.1 when compared with the classical management approach.

The EFQM model is used to assess business excellence by examining the performance results of TQM. EFQM seeks how much success an organization on satisfying customers, owners, employees, shareholders, suppliers and even society. Thus, an excellence rate is presented by the model to reveal deficiencies to be compensated in organizations' overall quality management.

Table 3.1: Classical management approach vs total quality management (Mevzuat Dergisi, 2002).

Classical Management Approach	Total Quality Management Approach
The objective of an organization is achieving the specified profit for fiscal period.	The objective is establishing and enhancing systems that guaranteed profitableness or increase it if possible.
Leaders make determining of which operations bring profits and how it should be.	Workers suggest how operational activities should be and how ensure of profits, and leaders confirm or not.
Employees chosen for where they will work considering their abilities and requirements of their job definition	Leaders and employees design the work plans to achieve organizational goals, so the job definitions specified co-operatingly.
Machines do works.	Everything is achieved by human.
Solutions are developed when encountered a problem	Solutions are researched to countermeasure possible errors
An “acceptable error limit” based model is adopted	A “zero error” based model is adopted
Prize and punishment based motivation is adopted	Work ethic is encouraged and appreciated
Quality of production is specified according to the standards	Quality of production is specified according to needs of customers

3.2 Basic Principles of the Model

3.2.1 Sustaining outstanding results

With outstanding results, excellent organizations meet the long-term and short-term requirements of shareholders and achieve their missions and visions. Excellent organizations;

- Are awared of what crucial results are required to make real mission, and what the importance of reaching to strategic goals is.
- Obtain ideas about requirements and needs of shareholders to use these informations as an input when identifying or reviewing the strategic policies thus organization remains prepared for possible changes.
- Use a clearly defined alliance of results within cause effect relationship to review proceeding, also to ensure short-term and long term plans are taken into consideration by main shareholders.
- Apply effective mechanisms to understand the scenarios about future and manage strategic risks.
- Define necessary outputs and relevant performance indicators; compare the results and mission & vision with other organizations when identifying the organizational goals.
- Apply policies that improve support strategy systematicly to achieve long term and short term organizational goals and results
- Bring sustainable benefits to shareholders and assess the performed results to make better future performance.
- Secure the perspicuous reporting activities which are intended to meet expectations of shareholders and related governance elements.

  Secure the correct and satisfying information transfer to the leaders in order to enlighten them on determining effectively and timely about organization's today and future (Kalder, 2010).

3.2.2 Adding value for customers

Excellent organizations aware of that their existence depends on customers so it is important to understand or forecast their requirements and needs to add them value and remain renewed. Excellent organizations;

- Know who are their different customer groups and meet these groups' different needs and expectations.
- Establish and maintain clear and perspicuous communication with all customers.
- Make effort to add value and remain innovative for customers.
- Secure the necessary tool, competence, knowledge and capability for employees to increase their experiences on customers.
- Monitor and review customer perception continuously and response their feedback effectively and rapidly.
- Add their customers to the process of new production and service development
- Compare their relevant performance values and be awared of their strong points to increase value which created for customers (Kalder, 2010).

3.2.3 Leading with vision, inspiration and integrity

Excellent organizations have leaders who steer the future and make it happen, acting as role models for the organizational values and ethics. Leaders of excellent organizations;

- Designate strategical targets and the route clearly and hold together their employees to achieve main objectives
- Understand the main dynamics of the activity areas. Compensate the organization and the shareholders on claiming the objectives and future planning.

- Prove that they can make well based and well timed decisions by considering obtained data, previous experiences and potential impacts of these decisions.

- Flexible, instil confidence; they make review, change or re-designate the route of the organization when it is necessary

- Are awared of that sustainable supremacy depends on new working styles, fast learning and fast responding capabilities

- Give influence to employees to establish an organizational culture of participation, appropriation, authorization and accountability

- Support a productive culture of new ideas and development to encourage innovation and progress in the organization

- Guide to actualize of organizational values to advance and solidify the reputation, acting as role models on social responsibility and ethical behaviors (Kalder, 2010).

3.2.4 Managing with agility

Excellent organizations are managed by information based decisions to create outstanding and sustainable results without go out of its strategical. Excellent organizations;

- Define a basic processes frame and manage it to create added-value for the shareholders. The frame consists of intercompatible processes and aims to explore most effective and active mechanism without disturbing the balance.

- Analyze the processes, classify them, scale them and actualize the true approaches to manage processes actively and effectively.

- Identify the main performance indicators, their outputs and measurements about strategic progress.

- Based on the real and reliable information with all of the obtained knowledge when making decisions and analyzing relevant processes.

- Ensure participation of employees to make them review and improve the effectiveness of their processes

- Manage entirely all processes to have desired performance and expected outputs (Kalder, 2010).

3.2.5 Succeeding through the talent of people

Excellent organizations value their employees, establish an empowerment culture to achieve individual and organizational purposes. Excellent organizations;

- Understand the required abilities and capabilities to make real mission, vision and strategic purposes

- Secure the full potential using and active contribution of employees to themselves and to organization for sustainable succeding

- Ensure of the consistency between individual (or team) goals and organization objectives, secure the empowerment of individuals and teams to maximize their contribution

- Actualize the proper approaches for establishment of balance between responsible operation of employees and their lives

- Secure and adopt employee diversity

- Support the organizational development with the share of values, accountability, ethic, reliance and clarity culture

- Define clearly the expected performance values from employees to achieve strategic objectives

- Encourage the employees for being creator and voice of sustainable succeeding of organization (Kalder, 2010).

3.2.6 Harnessing creativiy and innovation

Excellent organizations generate enhanced value and performance levels through sustainable development and systematic innovation by harnessing the creativity and innovation. Excellent organizations;

- Establish communication networks and manage them through internal and external warnings to identify innovation opportunities
- Define clearly the objectives and goals for innovation and enhance strategies to keep them prepared for reforms
- Generate approaches to take part of employees, co-operated organizations, customers and society in producing ideas and innovation activities
- Establish an entrepreneurship culture to realize of innovation in all fields
- Use innovation through going beyond of technical change to reveal new working styles and to enhance capabilities
- Use innovation to solidify the reputation and image of the organization, arouse interest of new customers, co-operated organizations and talents
- Have an open-minded understandingand they use innovation and creativity to overcome encountered difficulties
- Transform the new ideas into realistic processes that implement innovation
- Assess the added-value and effect of innovations (Kalder, 2010).

3.2.7 Developing organizational capability

Excellent organizations improve their capabilities by effectively managing of change within and beyond the organizational limits. Excellent organizations;

- Are awared of that the succeed depends on establishing effective co-operations

- Know what is the main purposes and seek for co-operation to add value to their shareholders through enriching capabilities and talents
- Establish extensive relationship networks to make easier identifying possible co-operations
- Understand that co-operations depend on long time common workings and sustainable increasing on value
- Based on organizational and strategic requirements, mutually complementary strong points and talents when identifying strategic and operational co-operations
- Establish co-operations for related shareholders to ensure systematic use of capabilities, synergy and compatible processes
- Study with supporting specialization, resource, information and knowledge with the purpose of gaining mutual advantages and reaching common objectives
- Establish sustainable relationships with the co-operated organizations within mutual reliance, respect and certainty (Kalder, 2010).

3.2.8 Creating a sustainable future

Excellent organizations establish a culture that consists of ethic understanding, clearly defined values and organizational behavior with high standards. This culture ensures sustainability on financial, social and environmental issues. Excellent organizations;

- Strengthen the future through identifying a main purpose that generates vision, values, ethic rules and organizational behavior
- Are awared of organizational competence and establishing relationships within social utility
- Take into consideration the possible contradictions as a mainstay when organizing sustainability on financial, social, environmental issues

- Demonstrate that the organization paying attention to the effects of their activities, product life-cycle and services when it comes to public health, safety and environment
- Ensure that a safe and healthy working environment for employees
- Ensure that employees are acted within the frame of the highest standards
- Encourage employees and other shareholders to participate them into the beneficial activities to society
- Are transparent to the society and their shareholders, support actively the desire of going beyond the legal necessity
- Allocate resources and maintain competitive capacity through meet the long term necessities instead of short term earnings (Kalder, 2010).

3.3 EFQM Model Criteria

It is possible to apply the EFQM in any organization or sector as a sustainable changing model. The framework of the model has nine main criteria, which are taken into consideration when conducting self-assessment. Five of these criterions are "enablers" and four are "results" as indicated in Figure 3.1. The "enablers" cover the organization's working style and efforts to achieve its objectives, and "results" cover how much success the organization on making realize of this. Therefore, "results" are caused by "enablers" and correct analysys of the results would increase the organization's capability on its journey of excellence (EFQM, 2014).

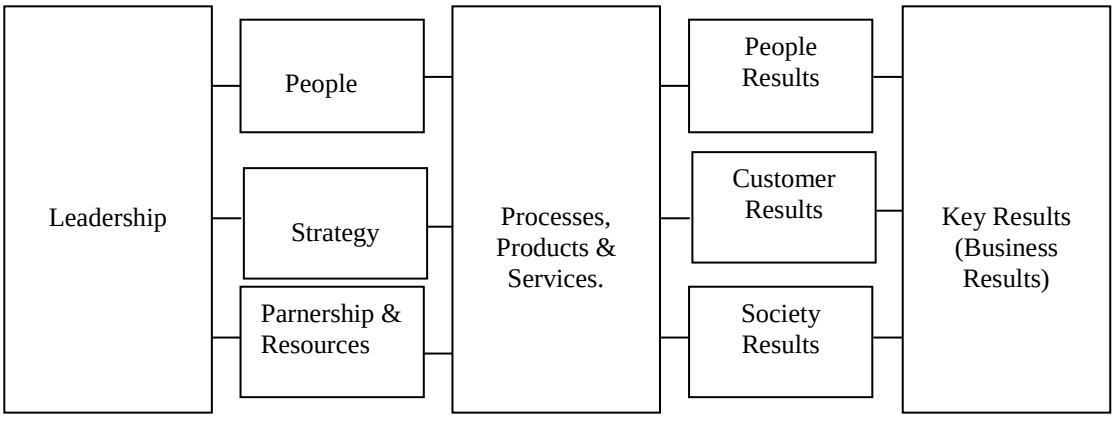

Figure 3.1: Main criteria of the EFQM excellence model (EFQM, 2014).

3.3.1 Leadership

Excellent leaders advance mission & vision and pave the way for it. They enhance the essential organizational values and systems for continuous success and actualize them through their activities and behaviours. In the change periods, they ensure the consistency of the objectives. The leaders could change organization's direction in a pinch and encourage the others to follow it. There five sub-criteria of Leadership;

a) Leaders act as a role model in the direction of excellence culture and establish mission, vision and values.

b) Leaders play active role in establishing management system, practicing of the system and its continuous improvement.

c) Leaders handle relationship with co-operated organizations and representatives of society.

d) Leaders strengthen excellence culture and with employees of organization.

e) Leaders identify the need of change and make guidance to it (EFQM, 2014).

3.3.2 Strategy

Excellent organizations create a shareholder focused strategy with the consideration of their market and sector, thus they accomplish the mission and vision. For make real the strategy, they create and apply plans, purposes, policies and processes. The strategy has four sub-criteria;

a) Organizations grow upon baseline as policy, strategy, necessities and expectations.

b) Organizations take as baseline as the information that obtained from policy, strategy, performance measurement, research, learning and external activities.

c) Organizations create, review and enhance their policy and strategy.

d) Organizations publish their policy and strategy and actualize the deployment through key processes (EFQM, 2014).

3.3.3 People

Excellent organizations ensure that their people use their knowledge and potential freely when it comes to work as a team or individual basis. Organizaions manage and enhance this equitably, encourage and empower their people's participation to activities. There are five sub-criteria for "people" and these are;

a) Excellent organizations design, manage and enhance their human resources policy.

b) Excellent organizations identify, enhance the knowledge and competence of their people in a sustainable way.

c) Excellent organizations ensure the people's active participation and empowerment.

d) There is always a dialogue channel between organization and their people.

e) Excellent organizations recognize and pay regard to their people (EFQM, 2014).

3.3.4 Partnership and resources

Excellent organizations manage their external co-operations, suppliers and internal resources to support active working of policies, strategies and processes. These organizations compensate the current and next requirements of society and environment when planning and managing partnership and resources. There are five sub-criteria of "Partnership and Resources";

a) Excellent organizations manage external co-operations.

b) They manage financial resources.

c) They manage buildings, equipments and materials.

d) They manage technology.

e) They manage information and knowledge (EFQM, 2014).

3.3.5 Processes, products and services

Excellent organizations design, manage and enhance the processes to support their policies and strategies and to satisfy shareholders with the intention of increasing their add-value. There are five sub-criteria of "Processes, Products and Services";

a) Excellent organizations design and manage processes systematicly.

b) In case of need, the organizations enhance the processes with innovator approaches to create increasing add-value and to satisfy customers and other shareholders.

c) Excellent organizations design and enhance productions and services with taking consideration of customer needs and expectations.

d) They product, advertise and provide services.

e) They manage and enhance their relationship with customers (EFQM, 2014).

3.3.6 Customer results

Excellent organizations use comprehensive performance and perception indicators and achieve succesfull results. There are two sub-criteria of "Customer Results";

a) Excellent organizations use perception indicators.

b) They also use performance indicators (EFQM, 2014).

3.3.7 People results

Excellent organizations use comprehensive performance and perception indicators related to their people and achieve succesfull results. There are two sub-criteria of "People Results";

a) Excellent organizations use perception indicators.

b) They also use performance indicators (EFQM, 2014).

3.3.8 Society results

Excellent organizations use comprehensive performance and perception indicators relted to society and achieve succesfull results. There are two sub-criteria of "Society Results";

a) Excellent organizations use perception indicators.

b) They also use performance indicators (EFQM, 2014).

3.3.9 Key results

Excellent organizations use comprehensive performance and perception indicators relted to their fundamental elements and achieve succesfull results. There are two sub-criteria of "Business Results";

a) Excellent organizations analyse main performance outputs.

b) They also anlayse the main performance indicators (EFQM, 2014).

3.4 RADAR Analysis Method

"RADAR" is a practical tool and a dynamic assessment frame, which ensures a structural approach to examine the performance of any organization. Radar indicates that an organization must consider these aspects;

- Identifying the indispensable results as a part of the strategy

- Planning and creating approaches that integrated with each other for achieve current and future results.

- Deploying the approaches to secure the application, assessing and enhancing based on monitoring, analyzing and continuous learning activities of obtained results.

There are five main aspects of RADAR; three of them (Approach, deployment, assessment & refinement) relating to assessment of inputs and rest of them (relevance & usability, performance) relating to assessment of results. In the figure

3.2 RADAR logic diagram is shown. There are four aspects of five in the figure and the reason is results could be accepted as one aspect instead of two output aspects of RADAR (Kalder 2010).

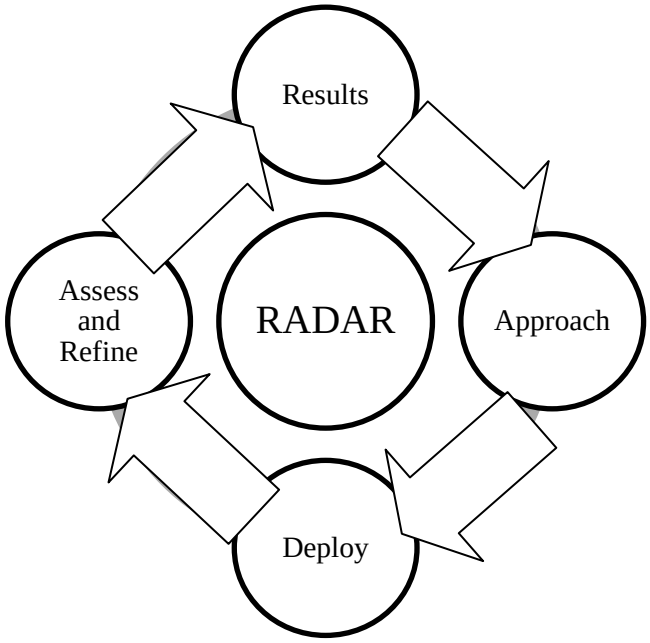

Figure 3.2: RADAR diagram.

3.4.1 Approach

The “approach” covers the organization’s action planning and reasons to making of it. A strong-based approach focuses on the current and future necessities; actualizes upon well-defined processes with consideration of shareholder’s requirements and expectations. Additionally, approaches are integrated, and integrated approaches select the strategy as a baseline. Thus, approaches are enhanced in the process of time (Kalder, 2010).

3.4.2 Deployment

The “deployment” covers what should do an organization to deploy its approaches. “Approach” is applied to relevant areas systematicly by excellent organizations. Systematic application is performed smoothly to “approach” and to organization in consequence of good planning. “Deployment” is actualized in a convenience time to manage changes within the scope of “approach” (Kalder, 2010).

3.4.3 Assessment & Refinement

The "assessment & refinement" covers what should be done to enhance approach and its deployment in the organization. Effectiveness of the "approach" and "deployment" are measured regularly in the excellent organizations. Learning activities are carried out and mechanisms that helping to production of new ideas are existed. Measure, learning and creativity outputs are used for identifying, prioritizing, planning and application of improvements and innovation (Kalder, 2010).

3.4.4 Relevance & Usability

Resulting data must be comprehensive, timely, reliable, correct, properly categorized and compatible with the strategy and expectations of shareholders. Relationship of results between each other must be well understood. Additionally, main results must be identified and prioritized by the organization (Kalder, 2010).

3.4.5 Performance

Excellent organizations have positively increasing (or positively remaining) results that indicate for a good performance. Main objectives are identified and achieved for main results. At the same time, performance that related to main results is compared with external organizations. Excellent organizations have better results than a good number of their rivals. Clear and positive relationship between inputs and outputs indicates that the organization will continue its good performance in the future. (Kalder, 2010)

3.5 Current Applications

Many studies have been conducted to measure and contribute organizational structures' excellence level. The EFQM excellence model has been applied to large spectrum of various fields since its intention. Illustrative cases are shown below in order to have insight for different application fields of the EFQM.

Business field is one of the large application area of the EFQM. As a contribution to this area, Tutuncu and Kucukusta (2012) revealed a strong relationship between EFQM excellence model and organizational commitment by applying the EFQM model to Turkish Quality Award winners' employees in 2004. In addition to this,

Aydin at al. (2012) proposed a study that based on a new analytic hierarchy process and EFQM Model to improve business performance excellence. They applied their proposed method on a case study to demonstrate using of different fuzzy scales to advance organizations in accordance with EFQM Excellence Award scoring system.

To advance on the employee motivation in organizations, Ehrlich (2007) used EFQM model combined with the Job Diagnostic Survey to develop a new Motivation Assessment Questionnaire with the intention of measure employees' work motivation and job satisfaction. Additinallly, Tari and Sabater (2006) reached that there is a relationship between quality management and human aspects in Spanish certified firms. Importance of human aspect in quality management is highlighted in the study.

In the safety and security field, Mariscal at al. (2012) use the RADAR logic of EFQM as a self-assessment tool in their study in order to measuring and improving the safety culture at a nuclear power plant. A security excellence research conducted by Martin at al. (2011) to measure the security posture and create a new security excellence approach under favour of EFQM model.

EFQM model has many applications on the education and training area, especially recently. Arjomandi at al. (2009) discussed the adaptation of EFQM Model to higher ecucation sector with the intention of systematic measurement of quality. They stated that such methods bring more quality in all aspects of higher education activities. Erturgut and Soysekerci (2009) have conducted another education and training study in Turkey through a field research. They carried out their application on three educational institutions by an EFQM based model in order to build sustainable development through education field as a fundamental component of the future.

In order to remove uncertainties of construction organization, Zadeh (2011) examined the excellence level of a construction company in each criteria of the EFQM. The study is conducted in three different periods to analyze differencies between the excellence levels. Hence, they homogenized the experiment conditions to present consistent indicators to the relevant managers.

Health and medicine is another field that many EFQM studies have been carried out. Nabitz at al. (2000) discussed the EFQM on a Dutch health-care organization to

illustrate their findings through model approach. Besides, Marques at al. (2011) applied the EFQM to phsycal activity programmes for elderly people and they reveal EFQM's benefits for this subject. It is expected to be a useful guide for relevant organizations seeking to increase their quality.

Black at al. (2011) have carried out a study about "biodiversity conservation" by use of EFQM model in order to contribute to the sector. Thus, a sector-specific Conservation Excellence Model is presented and illustrated through a field based programme.

EFQM is also used in tourism sector to provide better competetiveness to relevant organizations. For instance, Sozuer (2011) is examined the Turkey's market share in world tourism through EFQM model. The study is conducted with field surveys on eight four-star city hotels, and then revealed the weak points in criteria of leadership, strategy and people.

3.6 Model Conceptual Framework

The course of the application is completely based on the EFQM Excellence model and RADAR analysis method. It is shown gradually as a conceptual framework in Figure 3.1.

The framework consists of three main elements as; model, application and results. The "model" is based on a field survey approach that derived from both EFQM model and ship recycling industry. In other words, field survey is created by adapting the EFQM model to ship recycling industry in consideration with RADAR logic. As the second stage of the framework, the "application" is conducted based on the new originated field survey approach. The field survey is carried out through two different perspectives to have more accurated insight towards results. Demonstration is obtained through responses, comments, approaches, opinions and judgements of both academic and industrial perspectives. In the light of the demonstration, findings are discussed accordingly.

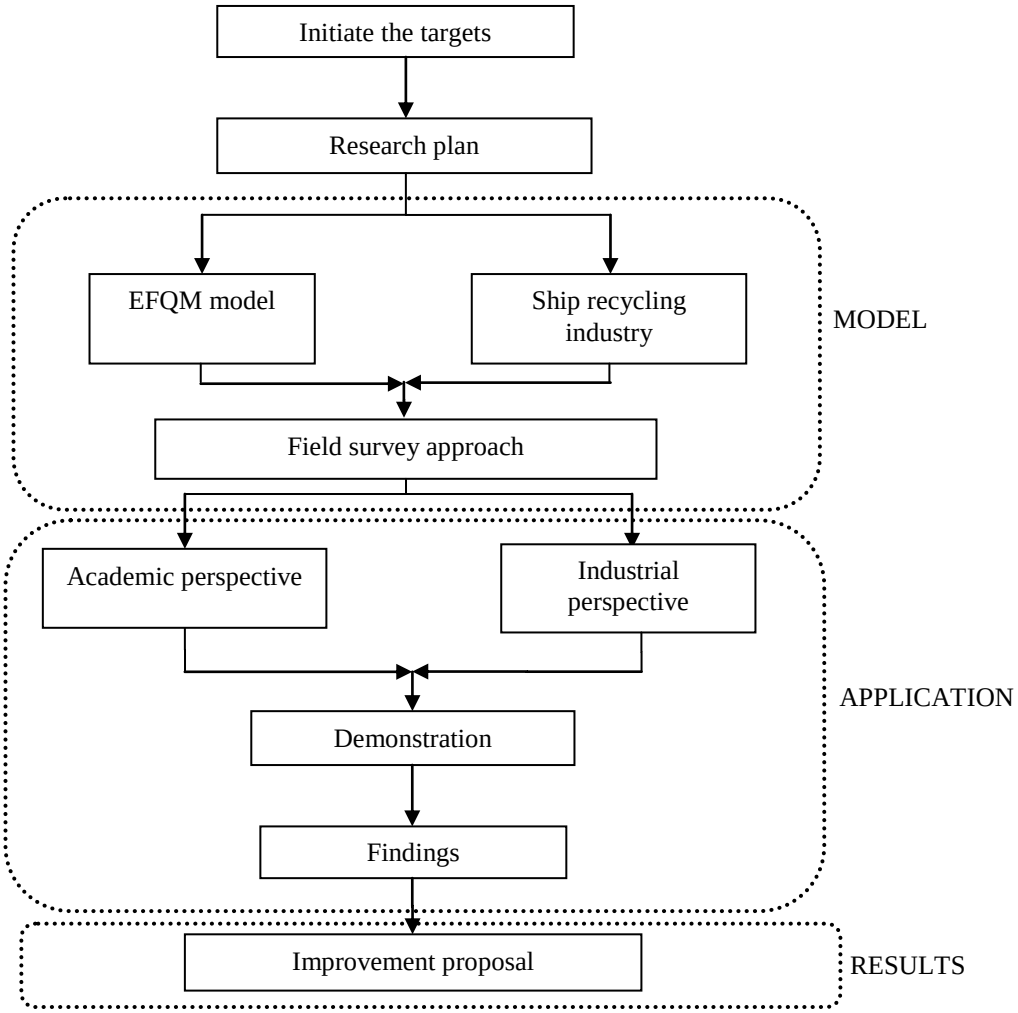

Figure 3.3: Model conceptual framework.

As the final stage of the framework, the "results" are revealed properly and improvements are suggested. Detailed examination of the framework is given under the "application stages" which is the next section of this chapter.

3.7 Application Stages

Application stages are expressed below respectively to give closer idea about how application is carried out:

The targets are identified to measure current position of the Turkish ship recycling industry , reveal the weak and strong points, in addition to this, propose realistic and expedient suggestions to provide sustainable excellence for the sector. Extending of the industry will bring many benefits to Turkey especially in many aspects of economy. However, apart from the size of the industry, a quality increase must be

ensured with the purpose of increase working condition standards and environment friendly actions. In addition to this, a development in the processes, work flow and technics containes in the targets.

Research plan is designed accordingly to the identified targets. To ensure sustainable development of Turkish ship recycling industry the most suitable model is searched for the study.

EFQM excellence model with the RADAR logic is adopted as the application method, this because, it is considered to be the most suitable model when considering iniated targets. A versatile assessment and accurate results are expected to be obtained through EFQM model.

To gain insight about ship recycling, researches that relevant to the sector are browsed and examined. Development of the ship recycling industry, current and past locations, ship recycling methods, its relevance with the environment and human health, entried into force and upcoming legislations, steel scrap market conditions, main ship recycling countries etc. are reviwed and interrogated.

A versatile literature review is carried out with regard to the many aspects of the ship recycling. Academic studies, research projects and industrial studies are reviewed elaborately. At the same time, EFQM excellence model and RADAR logic is analyzed. In addition to this, development of the total quality management and current applications of the EFQM model is surveyed.

To investigate the Turkish ship recycling industry, a field survey is created in accord with both EFQM model and ship recycling industry. It must be remembered that the EFQM model could be applied to any organizational frame of who has a desire to reach excellence. Sensitive aspects of the industry have been integrated into the survey without going off from the model. International legislations, working conditions, human health and environment are one of these aspects. Five question areas has been prepared for each main criterion of the EFQM. Hence, there are 45 question areas in the survey to measure excellence rate of the industry. Three of RADAR's main input aspects (Approach, deployment, assessment & refinement) also has been considered in preparation of the survey with the intention of obtaining more accurated results. In other words, one question area modified to three questions to instant transform of responses into the RADAR logic. Shortly, by three different

perspectives of RADAR, there are 135 questions in the survey to seek responses to assess excellence level of the Turkish ship recycling industry.

With the intention of obtaining realistic outputs, the survey has been carried out on worthy persons who have given their magnificent efforts to the Turkish Ship Recycling such as conducting Ship Digest project from academia. Their valuable responses, judgements, comments and opinions have been noted attentively.

In addition to the responses from the academic perspective, the survey has been conducted on the experienced experts from the industry also. To obtain outputs as numbers, inputs must be consisted of numbers eventually. For each response, sufficiency of evidences has been examined carefully. By this way, opportunity for comparison of different viewpoints between sectoral and academic opinions also have been founded.

According to evidences of responses, scores have been given to the each survey question that mentioned in the previous application stage. The obtained scores are could be used directly as inputs of RADAR. It must be noticed that RADAR logic has different weights for each main criterion of the EFQM. For instance, "customer results" criteria has 20% weightiness whilst "society results" has 6% when it comes to calculate the overall point for the industry. RADAR outputs are crucial results for any organization. It indicates how much excellent an organization and how much excellent the organization's main elements are. Strong and weak spots are revealed accordingly with RADAR's results points. In order to identify underlying reasons of the weak points, question areas illustrated for each main criterion of EFQM.

RADAR outputs are crucial results for any organization especially when conducting a self assessment. It indicates how much excellent the organization and how much excellent the organization's main elements according to EFQM. Strong and weak spots are revealed accordingly with its resulting points. Permanent solutions can only be achieved with a correct analysis. Outputs of RADAR are analyzed elaborately for the ship recycling industry by illustrations and extended discussions.

Permanent improvements cause change and excellence could not be reached without change. Weak spots of the industrial activities must be strengthened in a sustainable way and strong spots also must be discussed with the intention of clinching them.

Improvements are suggested and contributions are presented in this direction in order to enlighten ship recycling's today and tomorrow.

4. APPLICATION OF THE MODEL

Ship recycling is considered as one of the most environmentally friendly industrial activity in the sense of regaining the materials of an obsolete vessel. Almost all the material of a vessel can be recycled or reused in processes of varios industrial productions. Especially recycling of steel has a major contribution to both environment and nations' economic & industrial growth.

Despite its benefits, ship recycling stands as a matter of debate due to its unclear aspects. It is recognized as green industry and a major contributor to the employment, however it has negative impacts both to the environment and human health. International conventions about this issue have been studied for a long time, but beyond their implementational benefits, rules of the conventions themselves are still being argued and in developing.

According to 2011 data; Turkey is the fifth largest ship recycler country in the world by an amount of around one million tones ship recycling volume. Turkey also the most steel scrap importing country in the world by 21,4 million tones (Mikelis, 2013). When considering of external deficit; each tone of steel scrap obtained from ship recycling is for the benefit of Turkey in the sense of keeping the nation's treasury. A sustainable development is crucial for the industry, which is in need of any researches and studies to gain advancement.

Application of the EFQM Excellence model to the Turkish Ship Recycling Industry aims to reveal that; how much excellent the current industrial activities, which parts of the workstream are stronger or weaker and what should be done through permanent improvements to reach desired excellence level and sustainable development. In this application, many aspects that considered to be important have been handled on several counts by means of the elaborately prepared field survey.

4.1 Initiate the Targets

This study researches the problems of Turkish ship recycling, the underlying reasons of problems and make suggestions for the future to ensure sustainable development towards excellence. With the help of the EFQM model, the industry will be investigated on several counts such as; Leadership and their management abilities, processes optimization, innovative movements, human health and environmental issues, financial matters, preparedness to the upcoming conventions, occupational accidents, human resources policy etc.

However, as it is mentioned in previous chapters of the thesis, human health and environmental issues remain as the main problems of ship recycling in the world. Since the industry established, especially in South Asian ship recycling countries, numerous deaths and injuries caused by operational accidents have been recorded. Asbestos related diseases, neuropathic diseases, mental retardations, delayed neurological and physical development and various types of cancers have been observed so far in the ship recycling employees. Additionally, protective equipment, special training services and monitoring of decontamination facilities are not exist or insufficient (Shipbreaking Platform, 2012). Toxic and heavy materials originated from obsolete vessels contaminate the sediments of ship recycling sides. By this way, working area, seawater, ecological balance is affected negatively. Marine animals accumulate the heavy metals and other harmfull substances in their body and they become another threat for the human health when they are consumpted as food. Due to air pollution, forestland and vegetation near the industrial area also has been diminished (Demaria, 2010).

Lack of machinery using and badly monitored work operations are just another concerns for ship recycling activities. Safety controls, innovative mechanisms are still unsatisfactory in the working environment. Besides, ship recycling workers usually have limited access to health services and they have poor living spaces and facilities (ILO, 2009).

International conventions such as Basel Convention and HK Convention are still a matter of debate. Contents of the HK convention is criticized as it has many deficiencies on major and minor issues such as waste management, recycling of warships, incapable global registry system, ship recycling methods etc. Except for

the fact that the deficiencies of the HK Convention; its entrying into force criteria make it difficult to enact it (Chang at al. 2011). That means, it is still a long time to see the results of such conventions in consequence of their implementations.

An another matter of the ship recycling industry is an economical aspect which is unclear and wavy steel scrapping market and freight market. If freight rates are high, ship owners become reluctant to recycle their ships. Then as expected, ship recyclers compulsorily put up the prices that they offer. If steel prices are high, then ship recycling becomes more profitable. Besides, there is almost no chance for ship recycling to command the markets, because it is around 1,5% of world's steel making industry covered by ship recycling industry (Mikelis, 2013). Sometimes, both of these two market dynamics work disadvantegously for ship recyclers. Because freight market and steel market are not much dependent to each other and it is possible to see an increasing of freight rates while steel prices are decreasing. Naturally, at those times, ship recyclers are faced with a difficult financial challenge.

This study researches the problems of Turkish ship recycling, the underlying reasons of problems and make suggestions for the future to ensure sustainable development towards excellence. For this, a field survey has been conducted on both academic and industrial perspectives through visiting them; and then meeting and interviewing with them, as they are all closely relevant experts to Turkish ship recycling industry.

The Turkish ship recycling facilities have been located in Aliaga/Izmir as it is shown in the Figure 4.1. Ships have been dismantling in this region since 1976. Today, total area of Aliaga ship recycling zone is 633.877m² and the shore length is 1450m. There are currently 23 ship recycling companies are dismantling the obsolete vessels in the area (Arslan at al., 2013).

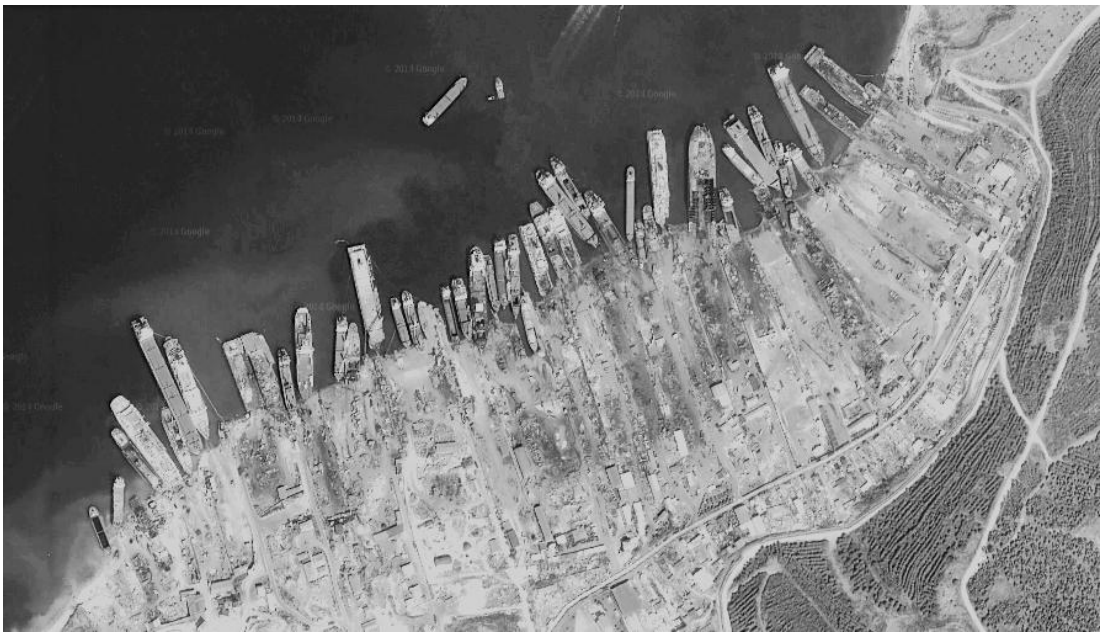

Figure 4.1: Aliaga ship recycling zone (Google, 2014).

Those companies are dismantling vessels by "landing" method. Landing is more environment friendly method when comparing with the "beaching" method, which is very common in South Asia (Arslan at al., 2013).

In Aliaga, more than 2000 people are working in the ship recycling industry and more than 5000 are working in the sub-industries, which are related to ship recycling activities. The industry reached its maximum capacity in 2011 with around 1.000.000 LDT ship dismantling volume (Tunarli and Fet, 2013).

4.2 Design Research Plan

A research plan is designed in accordance with the designated targets, elaborately. To achieve relevant problems, a suitable model is researched which has potential to bring permanent solutions from a different perspective. A model that systematicly interrogating the matter on several counts, and maintaining sustainable development is founded. By this way, on one hand, roots of the problems could be revealed, on the other hand solutions which are focused to the future objectives could be identified.. Then, results of the applied model are intended to analysis thoroughly and they are demonstrated transparently. Application method is dependent to the model, naturally.

In accordance with the model, demonstrations are performed and findings are derived.

4.3 Adopt EFQM Model

The EFQM is a framework that is aimed to establish sustainable organizational development. It could be applied in any organizational structure, regardless of their size or sector type (EFQM, 2014). Its innovative approach, the capabilities on both theorical and practical implementation and its efficiency is made EFQM as the most preferable model to the matter. Besides, the model has never been applied to the ship recycling industry, and it is another factor that makes the study as a contributor to the literature. Thus, EFQM model is adopted for this study. The application tool is chosen as RADAR logic, which is dependent on a fields survey. Hence, approach, deployment, review & assessment abilities of the organizations could be revealed through RADAR logic.

4.4 Review Ship Recycling Industry

The ship recycling is reviewed to gain insight about relevant researches with the intention of browsing and examining past studies. Development of the ship recycling industry, current and past locations, ship recycling methods, its relevance with the environment and human health, entried into force and upcoming legislations, steel scrap market conditions, main ship recycling countries etc. are reviwed and interrogated. Thus, knowledge has been obtained about top five main ship recycling countries and their characteristic features. Their overall situations and working performances are compared at the same time.

4.5 Conduct Literature Survey

A versatile literature review is carried out with regard to the many aspects of the ship recycling. Academic studies, research projects and industrial studies are reviewed elaborately. There are wide range of studies related to ship recycling as they are about environmental aspects, human health, occupational innovations, convention discussions, market conditions, sociologic impacts etc.

At the same time, EFQM excellence model and RADAR logic are analyzed. In addition to this, development of the total quality management and current applications of the EFQM model are surveyed. The current applications have a broad scope of studies and they are about; medicine, employee motivation, safety & security, education & training, construction sector, tourism etc.

4.6 Develop Industry Investigation Approach

The survey has been compiled upon nine main criteria of the EFQM Excellence Model and each criteria has fifteen questions to obtain input and output data sensitively. Questions have been prepared according to EFQM principals to analyze the ship recycling industry on several counts. The survey also designated to test the three main inputs of RADAR logic (Approach, deployment and assess & refine). The original of the survey has been given in Appendix – 1**.** Detailed overview of the conducted survey has been given criteria by criteria in following sections.

Asessing the main criterion 1: Leadership

Leaders shape the organization's future within the limits of their vision. In general, it is obvious if organizations have professional leaders or not when browsing organizations' activities and working types. Mission & vision is created by the leaders, therefore first question area in the "leadership" section is about interrogating the mission & vision values, their definitions, implementations and continuous analysis. Regardless of the type of sector or organization; for ship recycling or another industry, mission & vision values are the fundamentals of any organizational structure. Three questions (a, b, and c) are proposed in order to assess what RADAR logic needs as inputs in the Table 4.1.

Leaders are responsible to monitor relevant sectoral innovations and they always consider and review to integrate them into their organization body. As in other sectors, there are innovations and new systems for maritime engineering, ship building and ship recycling. In the second question area, this subject is proposed to assess how much successful the leaders when it comes to modernization of their industrial activities.

Thirth question area is about motivating the employees. Excellent leaders establish good relationships with their employees and they know how to motivate employees and make them focused on their job. For heavy industries just as ship recycling, motivation of the employee gives them an additional watchfulness apart from the effective working performance, which helps to prevent occupational accidents.

Fourth question area is interrogationg about giving value to employees by the leaders. Excellent leaders allocate time to the employees and listen to them for enhance working conditions. If working conditions improve, positive influence dominates the working environment, which is beneficial for the effective performance of organizations. Besides, they understand closely the many dynamics that exist in the working processes from their employees to have a broad idea about current problems or needed improvements of the organization.

Fifth question area is about relationships of the leaders with their shareholders. For ship recycling, brokers are one of the most important shareholders groups, which have crucial role when contacting ship owners to buy ships for scrapping. Excellent

leaders establish ethical, professional, respectful and transparent communications with their shareholders.

Table 4.1: The "Leadership" section of the survey.

#		QUESTIONS
1	**a**	Is mission & vision definition designated to fit with the purpose of organization realisticly by leaders?
	b	Is Mission & vision implementing as its definition?
	c	Is the activity and effectiveness of this implementation measured and analayzed?
2	**a**	Do leaders make effort for monitor sectoral innovations and integrate them into the organization structure?
	b	Are these innovations implemented realisticly?
	c	Is theactivity and effectiveness of sectoral innovations are measured and analyzed?
3	**a**	Do leaders make effort to motivate their employees in realistic and suitable way?
	b	How much successful the leaders about motivating the employees?
	c	Is motivation of employees under monitoring?
4	**a**	Do leaders make effort about allocating time to their employees and listening to them?
	b	How much enough time do leaders allocate to their employees?
	c	Is the effectiveness of such meetings are measured?
5	**a**	Do leaders make effort to establish good communication with shareholders (customers, brokers, partners etc.)
	b	Are these communications made in ethical and professional way?
	c	Is the effectivenss of established communications reviewed?

Asessing the main criterion 2: Strategy

Excellent organizations create smart strategies to achieve their objectives in their best way. They review the policies and strategies whether they are based on realistic values or not. They also monitor the effectiveness of strategies when it comes to implement it. Second section of the survey; "strategy" is prepared in this direction and it is shown on the Table 4.2.

First question area interrogates that how much compatible organizations' strategies and policies with the needs of their shareholders. Excellent organizations establish strategies with considering the needs of their shareholders. This is important to improve connections between customers, brokers, ship owners etc. when it is come to have strong business relationships in ship recycling.

Second question area of this section is about identifying the strategical priorities which are considered to be important for any organization. Excellent organizations are awared of everything that planned could not be done at the same time, and priorities must be designated in strategy properly. It must be remembered that,

strategical priorities are changing as time goes on thus, they need to be reviewed and renewed periodicly.

Thirth question area measures the effectiveness of the organizational structure and work processes as well. Excellent organizations have expedient organizational structure and they have working plan that flows according to that structure. Just as for any industrial structure, it is very important for the ship recycling activities and processes to have such an effective structural plan.

Fourth question area interrogates how much experienced, objective and capable the organizations when identifying strategical risks that probable to face. Since established, ship recycling industry has been exposed to various social, financial and legal crises. Excellent ship recycling organizations take advantages from past experiences in the world and they monitor closely the changes that is possible to affect their sector. Excellent organizations have enough capability to detect strategical risks.

Fifth question area can be considered as the second part of previous question area. When it comes to "strategy" which is one of the main criteria of the EFQM; it is crucial to manage strategical uncertainties in ship recycling industry.

Table 4.2: The "Strategy" section of the survey.

#		QUESTIONS
1	**a**	Do organizations make effort to forecast needs of their shareholders?
	b	Do organizations make movements in the direction of these needs?
	c	Do organizations make self assessment on this subject and can they calculate future needs?
2	**a**	Do organizations designate realistic strategical priorities?
	b	Do they act upon designated priorities?
	c	Are strategical priorities reviewed and renewed?
3	**a**	Are work processes and organizational structures identified expediently?
	b	Do works flow according to this structure plan?
	c	Is the effectiveness of organizational structure and work processes monitored?
4	**a**	Do organizations make effort to detect strategical risks objectively?
	b	According to the strategical risks, are necessary countermeasures taken?
	c	Are strategical risks reviewed and updated as time goes on?
5	**a**	Do organizations have an approach which provides rapid changes on their strategy and policies when unexpected situations comes up?
	b	Is this approach implemented successfully?
	c	Are the past experiences reviewed carefully and weak points of the approach removed?

Excellent organizations remain prepared to unexpected changes and they have an emergency plan on this matter. Without a doubt, this is very important point just as a litmus paper to be an excellent organization in ship recycling.

Assessing the main criterion 3: People

Excellent organizations ensure to build justice, equality, well-aranged work sharing between employees and give them value with their internal policies and employee focused applications. Table 4.3 shows the questions about this section.

First question area in this section is about human resources policy, which is just another crucial matter that excellent organizations be attentive on it. Ship recycling's one of the main problems is recruitment of unskilled workers. By the developed human resources policy, organizations achieve this matter easily. Apart from these mentioned workers, white-collar employees are also fall under in this question area. Effectiveness and actuality of this policy are also intended to be examined.

The importance of feedbacks that taken from employees are highlighted in the second question area. If an organization has a vision as adding value to their employees, their opinions and feedbacks must be taken into consideration. In addition to this, excellent organizations take necessary countermeasures or make improvements according to the feedbacks. This area is important for every industrial structure who challenge for the excellence.

Thirth question area interrogates the individual development of employees under changing industrial conditions. Excellent organizations march with the times by keeping their employees upgraded. For ship recycling industry, there are certified training courses for employees to measure occupational accidents by increase their conscious at some level. This question area also seeks an answer to how much helpful the training programmes in practice, if employees have already participated.

Fourth question area put emphasys on an operational control mechanism, which is another way to support countermeasure efforts on occupational accidents. New innovative movements on ship recycling have a desire to closer follow-up of employees by technological or expertized supervisor based control mechanisms. Excellent organizations are awared of their employees' operations by monitoring them with the purpose of cutting down the underlying reasons for any potential problem.

Fifth question area investigates the encouraging and motivating of employees, keeping their mood positive and rewarding them properly when organization achieves their objectives. Regardless of the sector type, every organization in the journey of excellence add value their employees for sustainable success.

Table 4.3: The "People" section of the survey.

#		QUESTIONS
1	**a**	Do organizations have human resources policy that fit with their objectives? (offering job, recruitment, carrier development etc.)
	b	Do organizations make movements in the direction of this policy?
	c	Is the effectiveness and activities of this policy reviewed and changed if in need properly?
2	**a**	Do organizations take feedbacks from employees for having advancement?
	b	Are feedbacks cared and assessed realisticly?
	c	Are countermeasures taken according to the feedbacks?
3	**a**	Do the organizations make effort for improvement and training of their employees?
	b	Are these efforts realistic, ethical and expedient?
	c	Is it assessed that whether objectives are achieved or not in this subject?
4	**a**	Have employees got conscious about occupational health and safety?
	b	Do they under monitoring when they are in operation?
	c	Is the effectiveness of this control mechanism reviewed?
5	**a**	Do employees get paid tribute for their positive behaviours?
	b	Are achieved successes shared with employees ethically?
	c	Is there any mechanism to measure the general mood of the employees?

Assessing the main criterion 4: "Partnership & Resources"

Excellent organizations manage their resources and establish strong relationships with their partners. Questions about this section are shown in the Table 4.4.

As seen in the first question area, success on managing the financial resources of the organizations is examined. Financial system and policy must be developed and kept in reviewed in excellent organizations regardless of their type of the industry.

Second question area interrogates taking feedbacks from the shareholders, which are also can called as main partners of organizations. Feedbacks make guidance to see requirements of shareholders to enhance relationships between them. For ship recycling, suppliers, brokers, governmental organizations and associations are considered to be important among partnerships.

Thirth question area is about one of the main concerns of ship recycling: environment. An excellent ship recycling organization adopts environment friendly policies that beneficial to environment, human health and relationships with neighbor facilities and governmental organizations. Moreover, excellent ship recycling organizations follow the national and international rules, which are critical about this subject.

Fourth question area browses how much successful an organization on monitoring their national and international rivals and their innovations that already integrated or about to be integrated by them. Ship recycling style and technological infrastructure very changeable with respect to different ship recycling countries in the world. An excellent ship recycling organization monitors closely such differencies in the world, analyzes them and makes effort for taking on them to the organization's body.

Fifth question area examines how much desired organizations about storaging knowledge and experiences in order to use them to enlighten their future. Information, knowledge and experiences considered as just another type of resources of an organization. Regardless of their sectoral types, excellent organizational enlarge constantly their information databases and when in need, transfer them to the relevant persons.

Table 4.4: The "Partnership & Resources" section of the survey.

#		QUESTIONS
1	**a**	Do organizations have a comprehensive policy about managing financial balances?
	b	Do organizations make movements in the direction of this policy?
	c	Is the effectiveness of this policy reviewed and assessed?
2	**a**	Do organizations take feedbacks from their major shareholders?
	b	Are feedbacks cared and assessed realisticly?
	c	Are countermeasures taken according to the feedbacks?
3	**a**	Do organizations have an environment friendly policy?
	b	Is the policy realistic and expedient?
	c	Have organizations achieved their realistic objectives about environmental aspects?
4	**a**	Do organizations search and monitor innovations about their sector and rivals?
	b	Are organizations successful when it comes to integrate technology and innovations into processes?
	c	Do organizations review their current technologic level periodicly?
5	**a**	Do organizations have a policy to storage and transfer the experience they have gained?
	b	Could relevant persons reach these information expediently?
	c	Do experiences and information accumulate and grow?

Assessing the main criterion 5: "Products Processes and Services"

Excellent organizations have effective processes by their smart and high-class work designs and methods. These methods must remain updated and prepared for current and upcoming quality standards or another changes to answer their requirements instantly. Table 4.5 shows the questions about this EFQM criteria.

First question area highlighted the design of work processes. Excellent organizations; regardless of their sector type, have professional, expedient, rapid and nearly errorless work processes design. Excellent organizations also analyze the effectiveness of their activities periodicly to keep them innovated.

Second question area is about technical optimization of the processes to enhance the effectiveness and quality. Just as the previous one, this question area covers a wide range of industries; apart from ship recycling. True timing and optimal production or service rate must be arranged properly and defined clearly in relevant policies of the organizations. Besides, for sustainability of that, these policies must be reviewed and if there is an acceptable reason, they must be renewed.

Thirth question area interrogates how much capable the organizations about "learn lessons from mistakes". Excellent organizations record the errors they experienced and find solutions as soon as possible to them. For ship recycling industry that has

been brought to the agenda with its occupational accidents, working errors and inconveniences; it is considered to be fairly significant point.

Fourth question area is just another crucial matter for ship recycling and other industries without a doubt. International regulations such as the Hong Kong International Convention are expected to bring major standards to authorize ship recycling facilities. An excellent ship recycling organization must be prepared for such these international rules even if it is necessary to make significant changes in the organization.

Fifth question area is a different approach to the processes with the intention of examining the effectiveness of current ship scrapping technics and methods they use. This area covers miscellaneous dimensions when it comes to technics of the ship scrapping. In Turkish ship recycling facilities, beaching and landing methods are used. It is also possible to have an insight on ship recyclers' desire about the methods they have and how much pleased they are with their own methods.

Table 4.5: The "Products, Processes & Services" section of the survey.

#		QUESTIONS
1	**a**	Do organizations have a realistic and expedient design of work processes?
	b	Do organizations make movements in the direction of this processes and design?
	c	Is the effectiveness of this processes and design reviewed and assessed?
2	**a**	Do organizations have an optimization policy for enhance the processes?
	b	Is this policy compatible with current processes?
	c	Is this policy reviewed and assessed?
3	**a**	Are inconveniences recorded realisticly and expediently?
	b	How much successful the organizations on prevent them?
	c	Are the relevant assessments made for to not repeat of inconveniences?
4	**a**	Do organizations make effort to adapt for legislations in force or legislations expected to entry into force?
	b	Are the efforts realistic and expedient?
	c	Are the policies about this matter reviewed and renewed?
5	**a**	Are current ship scrapping methods of the organizations identified to actualize work processes expediently and beneficial?
	b	Is the effectiveness of the methods at a satisfied level?
	c	Are the methods and relevant studies in the world monitored and differencies revealed?

Assessing the main criterion 6: "Customer Results"

Excellent organizations achieve outstanding results with respect to their customers through meet their expectations or exceed them. For ship recycling industry, when considering upcoming regulations, this section put emphasys on preferability reasons

such as worldwide reputation, providing convenience, recognization and less occupational accident frequency as shown in the Table: 4.6.

First question area examines worldwide image and reputation of ship recycling organizations. Responsible ship recycling facilities are expected to be chosen increasingly by responsible ship owners according to upcoming regulations. It is not much possible to make changes on price offers to step up against the rivals. But having a positive image in the world is gaining importance and bring benefits especially in the future.

Second question area is about encouraging the customers or middlemans to increase their co-operation desires. In ship recycling industry, ship owners and brokers are vital for buying obsolete vessels to scrap. Thus, what excellent organizations have to do is; provide convenience them on information transfer, being transperant on financial issues and supporting them when they face difficulties.

Thirth question area could be considered as it consists of pure self-criticism. Excellent ship recycling organizations are awared of why they are chosen by customers or brokers, and they review periodicly their strong and weak points to make progress.

Fourth question area interrogates a different type of increasing reputation. Excellent ship recycling organizations must increase their recognization in international forums, environmental platforms and non-governmental organization activities by taking active roles expediently.

Fifth question area is about comparing with the other ship recycling facilities when it comes to fatal or not fatal operational accident frequency.If a ship recycling organization has a desire to reach excellence, occupational accidents must be solved in a sustainable way. Excellent ship recycling organizations never make any operational accidents.

Table 4.6: The "Customer Results" section of the survey.

#		QUESTIONS
1	**a**	Do organizations have any policy towards their worldwide image and reputation?
	b	Do organizations make movements in the direction of this policy?
	c	Is the effectiveness of this policy reviewed?
2	**a**	Do organizations support their customers and brokers by providing them convenience?
	b	Is information transfer, communication, financial transperancy established expediently?
	c	Is there a "positive upturning" that can be proved on this matter?
3	**a**	Do organizations seek an answer for why they are chosen or not chosen by ship owners?
	b	Are realistic and objective analysis made?
	c	Are necessary actions taken for strong and weak points?
4	**a**	Do organizations make effort for increase their recognization in the world?
	b	Are organizations shown on the international forums, environmental platforms and non-governmental organization activities?
	c	Do organizations increase their positive reputation in the world?
5	**a**	Do organizations compare themselves with other ship recycling nations when it comes to frequency of occupational accidents?
	b	If an accident occurs, is it analyzed and recorded objectively?
	c	Is there "positive upturning" recorded on this matter?

Assessing the main criterion 7: "People Results"

Excellent organizations achieve outstanding results with respect to their employees through meet their expectations or exceed them. Another crucial, worth-stressing point for ship recycling and the questions about this matter is shown in the Table 4.7.

First question area examines a general satisfaction level of the employees about working conditions in the ship recycling organizations. Excellent ship recycling organizations must be awared of if there is negative opinions coming from their employees and they ensure to create employee friendly working environment.

Second question area browses the loyalty of the employees and seeks an answer for the subject of keeping the experienced employees in the sector. Loyalty and experience are considered to be very linked with each other in this question area. Regardless of the type of the sector, excellent organizations make investments to the "experience".

Thirth question area is about training of the employees, which is prevail among ship recycling industry according to last taken countermeasures to increase awareness of

the employees. By this reason, capability of the ship recycling organizations about this subject is questioned.

Fourth question area of this section interrogates the internal communication quality and its efficiency in the ship recycling organizations. Regardless of the type of the sector, excellent organizations are awared of the importance of the communication efficiency when it is come to put into practice the planned actions.

Fifth question area questions the employees' satisfaction about respecting their rights. Excellent organizations have respect to the human rights, employee rights and the relevant legislative regulations. Excellent ship recycling organizations must satisfy their employees realisticly about this subject.

Table 4.7: The "People Results" section of the survey.

#		QUESTIONS
1	**a**	Are thoughts and opinions of the employees about working conditions known by the organizations?
	b	Are negative opinions cared and changes made in this direction?
	c	Are the change results reviewed and positive upcoming recorded?
2	**a**	Do employees have loyalty to their organizations?
	b	Are the numbers of experienced employess increasing in the organizations?
	c	Is situation assessment made and necessary measures taken?
3	**a**	When in need of any requirements, do organizations provide training to the employees?
	b	Is the effectiveness and quality of such trainings analyzed?
	c	Is there "positive upturning" recorded on this matter?
4	**a**	Is internal communication at good level in the organizations?
	b	Is this matter reviewed and inconvenciences corrected?
	c	Is there "positive upturning" recorded on this matter?
5	**a**	Do organizations have great respect to their employees' rights?
	b	Are there practices to satisfy the employees when in the cases of illness, giving absence, leaving the job, early quits?
	c	Are the employees' satisfaction measured and it is in a sufficient level for this subject?

Assessing the main criterion 8: "Society Results"

Excellent organizations achieve outstanding results with respect to the society through meet their expectations or exceed them. Besides, for ship recycling industry, governmental organizations, neighbor relationships, surveyors, universities or scientific centers are handled in this section of the survey as it is shown in Table 4.8.

First question area is asked to measure how much be awared the organizations about society's opinions on the environmental issues and working conditions. Ship recycling organizations must notice the remarks of the society to have better insight of them on the journey of excellence.

Second question area is about responsibilities and relationships between neighbors, which is considered to be important for ship recycling facilities. The organizations share a common working environment which they conduct such a heavy industrial activities that also famous with their negative impacts to the environment. Excellent ship recycling organizations must be responsible to their neighbors about expected or unexpected matters and they must strive to find sustainable solutions in any relevant cases.

Thirth question area examines the success rate of inspections and surveys that is conducted by the relevant organizations of government. Excellent ship recycling organizations are experienced successful surveys and take excessive measures on their activities and working processes.

Fourth question area is asked to measure how much capable the organizations when it comes to cooperate with universities or other relevant scientific centers. Excellent organizations regardless of their type of sector, establish expedient connections between various educational agencies to take realistic and sustainable developments.

Fifth question area seeks for answer about how much efficient cooperations are made between the governmental organizations. Governmental relationships are substantial for maritime industries as well as ship recycling. As a difference, government's approach to the subject also interrogated in this area.

Table 4.8: The "Society Results" section of the survey.

#		QUESTIONS
1	**a**	Are thoughts and opinions of the society about working conditions and environmental issues monitored by the organizations?
	b	Are negative opinions cared and changes made in this direction?
	c	Are the change results reviewed and positive upcoming recorded?
2	**a**	Do organizations have good approach to the relationships with their neighbors on the environmental and areal matters?
	b	Are relationships managed in the frame of ethical rules and responsibility?
	c	Are disagreements happened frequently? Are they resolved in a professional and sustainable way?
3	**a**	Are the organizations transparent and regular when authorized surveys come to inspections?
	b	Are the inspections ending with unsuccessfulness?
	c	Is there "positive upturning" recorded on this matter?
4	**a**	To build sustainable change, are scientific perspectives noticed as a result of the cooperation with universities/or relevant organizations?
	b	Are the efforts which made brought realistic contributions?
	c	Are there efforts to enhance these cooperations?
5	**a**	Are there policies for cooperating with governmental organizations to make sustainable developments in a large scope?
	b	Are the cooperations realistic and expedient?
	c	Are there efforts to enhance these cooperations?

Assessing the main criterion 9: "Key Results"

Excellent organizations achieve outstanding results with respect to the key aspects of their policy and strategy. For ship recycling industry, key results are built on financial results, total volume of scrapped vessels (Total volume of lightweight), performance indicators, error frequencies and investment to the information. The questions about this section are shown in the Table 4.9.

First question area seeks answers for the succeeding on financial control of the organizations. Regardless of the type of the sector, excellent organizations achieve outstanding results when comparing their financial management with their rivals. They make efforts to clinch those results with sustainable solutions they brought.

Second question area is about performance results of processes and services the organizations produced. How much efficient the ship recycling facilities when conducting their processes under time constraits. Apart from the ship recycling, each type of industrial facilities must obtain significant results on this subject in the course of excellence.

Thirt question area interrogates the total volume of their activities as another key result to have insight about overall performance of the organizations. Regardless of the type of the sector including ship recycling must obtain sustainably satisfying results in the journey of excellence.

Fourth question area examines the error occurance frequencies in the operational activities of the organizations. As it is known, ship recycling has considerably high error rates when comparing the other sectors. To reach excellence, permanent solutions must be proposed by the organizations on those matters to gain sustainable development.

Fifth question area questions the investment to the information that made by the organizations. Sometimes, in most maritime industries; it is too difficult to obtain realistic data from owners due to their reluctance whether any sanctions may comes up as a result of unexpected mistakes when they are exposed by expertized persons. Excellent organizations have confidence to their activities and they ensure transparency on information exchange to obtain realistic and sustainable enhancements from expertized persons or academicians.

Table 4.9: The "Key Results" section of the survey.

#		QUESTIONS
1	**a**	Do the organizations monitor and compare their financial results with their rivals?
	b	Are compared results satisfying?
	c	Is there any effort to ensure sustainable upturning?
2	**a**	Are performance results of the processes measured and analyzed?
	b	Are the performance results in the course of upturning?
	c	Are sustainable solutions or improvements made to have better results?
3	**a**	Do the organizations measure the total volume of services they produced?
	b	Are the total volume results in the course of upturning?
	c	Do the organizations make effort to clinch their succeeds through sustainable development?
4	**a**	Do the organization analyze their error frequencies and loses that comes up during operations?
	b	Are the error frequency rates upturning?
	c	Is the upturning braced out from sustainable actions?
5	**a**	Do the organizations have realistic desire about storaging relevant information?
	b	Is the storaged information analyzed and shared with experts or relevant academicians?
	c	Are the academic studies on this subject realisticly cared? Are sustainable actions taken in the light of those studies?

4.7 Responses

Experts that closely relevant to ship recycling from academic researches and industrial activities who have been issued their significant responses, opinions, approaches and additional comments in response to the survey. Then, industry investigation approach based on RADAR logic items is designated. A great effort is given to take response from academic and industrial perspective to make comparison of different viewpoints between sectorial and academic opinions. They have never hesitated to share their experiences and knowledge about the questions that have been asked to them. The numbers of 135 questions are involved. In detail, academic response to the each question is provided by a consortium member of Ship DIGEST project in a consensus reflecting the project findings on the region. On the other hand, an experienced maritime entrepreneur in ship recycling (former owner of a ship recycling company) who is currently the active member of shipbuilding industry association and former member of ship recyclers' association provides the industrial response. Hence, the industry investigation approach enables to transform both the industrial and academic experiences via two different self-assessment judgements in demonstration phase. The both judgements can be found in Table C.1-C.9 and D.1-D.9 in the Appendix-C (Academic Judgement) and Appendix-D (Industrial Judgement).

According to academic experts, responses to the "Leadership" criterion are given as follows;

- They are unsatisfied when it comes to establish a realistic mission & vision definitions to implement it. Even if it is implementable, leaders of the ship recycling organizations have practically no interest to this subject. There is almost no evidence to consider as discernable efforts on this matter.

- The leaders have a fair amount of effort to monitor sectoral innovations and desire to integrate them into the organizations' body. But when it comes to

make its implementation, due to various problems and impossibilities they could not be succeeded.

- Leaders make some efforts to motivate their employees but they could not reach their target on this matter. In other words, they are sufficiently failed with their efforts.

- Leaders allocate time to their employees and listen to them at some level. However, the meetings are not conducted efficiently as they had been expected.

- Leaders establish considerably good communication with their key shareholders. They behave professional but they fall behind when it comes to interrogate and review their abilities.

According to academic experts, responses to the "Strategy" criterion are given as follows;

- The organizations make insufficient effort when it comes to forecast and meet the needs of their shareholders. Efforts are far away from to be realistical and expedient.

- The organizations identify strategical priorities at medium level. But they are failed to review those priorities periodicly and sustainably.

- The organizations have work processes and organizational structure but it is not developed. Works do not flow mostly according to plan.

- The organizations make efforts to detect strategical risks but they are not much good when taking necessary countermeasures to avoid them.

- The organizations have not developed much yet when it comes to make swift changes on their policy and strategy. But it is not in so poor level to be blamed.

According to academic experts, responses to the “People” criterion are given as follows;

- The organizations have a policy about human resources but it is not much expedient. They are not much good on human resources policy but also not much poor.
- The organizations remain inadequate when it comes to take feedbacks from the employees. Even if they take, it is not conducted periodicly and frequently.
- The organizations are solid enough for training and development activities of their employees. They also measure the efficiency of the trainings at some level.
- The employees have conscious about the occupational health and safety; however, it is not at the desired level yet.
- The employees get paid tribute for their labors when the organizations achieve their objectives. Tributes are at medium level.

According to academic experts, responses to the “Partnerships & Resources” criterion are given as follows;

- The organizations have policy on their financial issues and it is as average level. They strive to follow their policy but they are relatively insufficient when it comes to review and update their policy sustainably.
- The organizations show some evidence on taking feedbacks from their shareholders. They notice and make efforts in the direction of feedbacks they have taken. Their ability is quite solid on this subject.
- The organizations show respects to their environment and they have a policy about that. They are considerably good when comparing with the other ship recycling facilities. They achieve their objectives in environmental aspects but there is still way to be excellent on this matter.

- The organizations show evidence to monitor innovations about their sector at a medium level. Nevertheless, they are poor to implement them into organization's body

- The organizations have a policy to storage and transfer the experience they have gained. They have average internal experience sharing level. Their information in the direction of growing, however it is not rapid as expected.

According to academic experts, responses to the "Processes, Products and Services" criterion are given as follows;

- The organizations have design of work processes at average level. They strive to follow their plans and measure their efficiency.

- The organizations are relatively poor to enhance their policy about optimizing the processes and their design. Their optimizations compatible with the current operations but inadequate to review them.

- The organizations are not solid on recording their inconvenience. Besides they do not strive enough to prevent them.

- The organizations show good evidences to adapt current international legislations. They also take serious of upcoming rules and have a desire to remain prepared. Their efforts are above average on this matter.

- The organizations conduct their activities by beaching and landing methods of ship recycling. However, they are not satisfied with their current methods and they are awared of different ship recycling methods.

According to academic experts, responses to the "Customer Results" criterion are given as follows;

- There is no true evidence for adopting a policy towards the worlide image and reputation of the organizations. They have poor efforts for this matter.

- The organizations support their brokers and customers at medium level. They are transparent in relationships but they do not interrogate their actions.

- The organizations are poor to seek an answer for why they are chosen by ship owners. However, this question is asked to have insight their future actions towards upcoming international conventions. They have no significant preparation on this matter.

- They make some effort to increase their recognization at international forums, various platforms and social activities. Even if they are at insufficient level, there is an upturning have begun about this issue.

- The organizations seriously compare themselves with other ship recycling nations on occupational accidents occurance frequency. On the contrary of other questions of this criterion; they are outstanding when comparing with the other ship recycling nations.

According to academic experts, responses to the "People Results" criterion are given as follows;

- The organizations are well awared of their employees' opinions about the working conditions. They are not solid on caring their insights and they do not make satisfying positive changes for the conditions.

- The employees have loyalty to their organizations. The organizations increase the number of experienced employees even if it is slowly. They are not solid on taking preventions for this matter.

- The organizations act responsively when it comes to meet the requirements about employees' developments. They achieve good results on this matter.

- The internal communication is at good level in the organizations. There is almost no inconvenience that arisen from communication.

- The organizations have some respect the rights of their employees but it is at unsolid level. Anyway, in the cases of illness or another relevant situations, they have relatively better implenetations for the employees. However they do not measure the satisfactions at desired level.

According to academic experts, responses to the “Society Results” criterion are given as follows;

- Opinions of the society have not good about ship recycling working conditions according to monitoring results of the organizations. However, there are some desires to change and make correct about bad image in this issue.

- Neighbor relationships are clearly poor for the organizations. Even so, there are some upturning signals to take forward steps on this matter.

- The organizations are quite transparent and regular for authorized surveys and inspections. They achieve their objectives on this matter and there is also a upturning recorded for this subject.

- Cooperation with universities are at poor level but there is a little amount of upturning exists.

- Cooperation with governmental organizations relatively better than the universities nevertheless, they are at unsolid level. A little amount of realistical actions in the course of enhancing.

According to academic experts, responses to the “Key Results” criterion are given as follows;

- The organizations make not much effort to compare their financial results with their rivals. They also could not obtain satisfying results and there is no signal to an upturning on this matter.

- Performance results are measured and analyzed even if they carried out uninterestedly. There is no noteworthy signal for an upturning on this matter. However, sustainable solutions are tried sometimes.

- The organizations well awared of how much services that they are produced. In recent years, results about this issue have been increased. Efforts that made for sustainable development are not satisfying.

- The organizations analyze their error frequencies uninquisitively. However there is an upturning on this matter. Some constructive solutions become sustainable.

- The organizations storage the data and informations they have obtained. They are shared those information objectively but it has limited evidences. Academic studies are not much cared and sustainable actions rarely taken in the light of those studies.

Experts that closely relevant to ship recycling from industry have been issued their experiential responses, opinions, approaches and additional comments in response to the survey. They have never hesitated to share their information and knowledge objectively about the questions that has been asked to them. According to their responses, scores have been given based on their comments or scores have been directly given by the experts, at times. Judgements of the Industry is given in Table: D.1- D.9 in the Appendix-D.

According to industrial experts, responses to the "Leadership" criterion are given as follows;

- Leaders define mission & vision sufficiently and make efforts to follow them. But they are failed when it comes to update and upgrade them.

- Leaders monitor, integrate them into the organizations and analyze the results on this matter and all of them are at above average level.

- Leaders show some evidence for success about motivating the employees. However, they are not much awared of how much efficient the meetings are.

- Leaders make a fair amount time for their employees and listen to their problems. They are also awared of whether their efforts bring benefits or not.

- Leaders establish expedient communications with their shareholders. They behave professionally but they are not awared of whether they make mistakes or not.

According to industrial experts, responses to the “Strategy” criterion are given as follows;

- The organizations make efforts at medium level, but they relatively poor on following their efforts when it comes to meet the expectations of their shareholders. However they seriously strive to be better on this subject.

- The organizations make magnificent efforts to identify their strategical priorities. They care their priorities and follow their plans. Besides they review and renew their plans sustainably at above average level.

- The organizations clearly identify their work processes and organizational structure. They strive to follow them but they are poor in reviewing their structure.

- The organizations have considerable amount of desire to detect strategic risks and they make effort for it but in practice they are nearly failed.

- The organizations have a fair amount of capability to change their policy and strategy rapidly. Nevertheless, they are clearly failed in the practice.

According to industrial experts, responses to the “People” criterion are given as follows;

- The organizations have magnificent human resources policy and they are loyal to their policy in practices. They also monitor the efficiency of their policy.

- The organizations take feedbacks their employees as how it is desired to be. They care the opinions of employees and strive to make enhancements through the feedbacks.

- The organizations are almost excellent about training and development of their employees. They interrogate the results of the trainings and they make some advancement on this matter.

- The employees have conscious brilliantly and they know what they are doing on the operation. The employees are also monitored at some level when they are on the job.

- The employees are rewarded considerably by the organizations when they achieve their objectives. They also strive to keep employees in a good mood.

According to industrial experts, responses to the "Partnerships & Resources" criterion are given as follows;

- Just as academic experts, financial management methods of the ship recycling organizations are at average level on every count.

- The organizations seriously care to take feedbacks from the shareholders and take precautions when it is necessary. The organizations have above average abilities for this matter

- The organizations are outstanding when it comes to have environmental friendly policy. They are also strongly follow their policy in practices and in parallel with it, they achieve their objectives in this matter.

- The organizations have fairly good approach to monitor the innovations about their sector. They are clearly achieved their desires on integrating innovations their body.

- The organizations have significant policy for storaging of experience and its deployment in the working envirıonment.

According to industrial experts, responses to the “Products, Processes and Services” criterion are given as follows;

- The organizations design their processes clearly and they follow seriously their approach. They remain at average level when it comes to review and assess their current operation technics.

- The organizations are unsolid about optimizing their working processes to conduct them more rapid or carry them at a higher class. There is almost no evidence that they review their efforts for this issue.

- The organizations monitor and record intensively the inconveniences they are faced with. They also successfully interfered to the matter and obtain positive results considerably.

- Just as the academic insight; the organizations majorly take serious the legislations that both already entered into force and upcoming ones.

- The organizations are not content with their current ship recycling methods. But they satisfy at some level with them and they are very much awared of the different methods applied in other nations.

According to industrial experts, responses to the “Customer Results” criterion are given as follows;

- The organizations have a policy towards the image and reputation however, the policy is not efficient.

- The organizations support their brokers and customers at very high level and they are majorly transparent in their communications.

- The organizations are awared of why they are chosen by ship owners to scrap their obsolete vessels, but they are relatively poor on taking necessary actions when it comes to enhance weak points.

- The organizations seriously strive to increase their recognization in the world. They are at below average level when considering the what is expected from them but there are also promising progressions recorded on this subject.

- The organizations are quite solid about occupational accidents when compared to other nations. However, accident analysis that made are relatively unsolid.

According to industrial experts, responses to the "People Results" criterion are given as follows;

- The organizations are clearly awared of the employees' opinions about working conditions and they make efforts to correct negative aspects in the direction of obtained opinions. They have fairly good results on this matter.

- The employees are quite loyal to their organizations and they become more experienced as time goes on.

- The organizations are almost excellent to meet any requirements or standards that is asked from them about their employees. They also achieve magnificent results on this matter.

- The internal communication is at good level in the organizations. It is actualized in quite professional way and wthin the frame of job ethics.

- The organizations have zero tolerance towards any injustice actions to the employee rights. But they are at medium level when it comes to review their policy about this matter.

According to industrial experts, responses to the "Society Results" criterion are given as follows;

- Opinions of society are monitored but they are not good enough.

- The organizations have standard level of neighbor relationships but sometimes there are irresponsible behaviours are seen. However the direction of change is encouraging.

- The organizations are transparent and regular about surveys and inspections. There is almost no unsuccessful inspection ends with a bad result.

- Cooperation with universities or other scientific centers are insufficiently made. However, it is in the course of development.

- Cooperation level with governmental organizations is relatively poor than previous question area. There is also not considerable positive change on this matter.

According to industrial experts, responses to the "Key Results" criterion are given as follows;

- The organizations make some effort to compare their financial results with their rivals. However they achieved average results.

- The organizations analyze their performance results at some level. The results are average and a little upturning is recorded on this issue.

- The organizations comprehensively measure their total volume of services. Results are promising but it is not clear that those results based on sustainable actions.

- Error frequencies are measured at some level. Nevertheless, the error rates are declining even if sustainable actions are not taken promisingly.

- The organizations are good on information storaging. They share when it is asked from them by the relevant expertized and authorized persons. Academic studies are not cared but there are some promising signals for the future.

4.8 Perform Demonstration

Assessment of the obtained information from academic and industrial experts has been made by RADAR scoring system. The responses are analyzed and transformed into tangible data as compatible with the EFQM model criteria. "Outputs of RADAR scoring matrix" is shown in the Table A-1 (in Appendix A). Outputs of RADAR logic consists of results and scope elements.

Enablers of RADAR logic consists of three elements. They are namely; approach, deployment and assessment& review. "Enablers of RADAR scoring matrix" is given in Table B-1 (in Appendix B).

The calculation has been made through RADAR logic's excellence points. As a next phase; awarded scores that obtained in the calculation of enablers and results matrix have been multiplied their main criteria coefficients. The coefficients and the way of calculation are shown in the Table 4.10.

Table 4.10: Calculation of total excellence points.

Criterion	Score Awarded	Coefficient	Maximum Points Awarded	Maximum Total Points
1. Leadership		x1.0	100	500
2. Policy and Strategy		x0,8	80	
3. People		x0,9	90	
4. Partnerships& Resources		x0,9	90	
5. Processes		x1,4	140	
6: Customer Results		x2,0	200	500
7. People Results		x0,9	90	
8. Society Results		x0,6	60	
9. Key Results		x1,5	150	

4.9 Derive Findings

Criteria of the EFQM model has been used for identify the current excellence situation of Turkish Ship Reycycling Industry. Obtained responses, opinions and comments from the respectable experts from academia and industry transformed into

tangible data. For example, the calculation of excellence rate for leadership criterion is given as follows;

i) Excellence rate of academic judgement

$$\frac{\frac{(50+25+0)}{3}+\frac{(25+50+0)}{3}+\frac{(50+25+25)}{3}+\frac{(50+50+25)}{3}+\frac{(75+50+50)}{3}}{5}=36.67$$

ii) Excellence rate of industrial Judgement

$$\frac{\frac{(50+25+0)}{3}+\frac{(75+75+50)}{3}+\frac{(50+50+25)}{3}+\frac{(50+50+50)}{3}+\frac{(75+75+25)}{3}}{5}=48.30$$

iii) Excellence rate of the leadership

$$\frac{36,67+48,30}{2}=42.48$$

Following the similar way, the excellent rates for the each criterion is found and particularly given for the leadership criterion is in Table E.3 at Appendix-E.

The details are provided in Table E.1- E.3 (Appendix-E). Distrubition of excellence rates for all criteria is shown in data are illustrated in Figure 4.2.

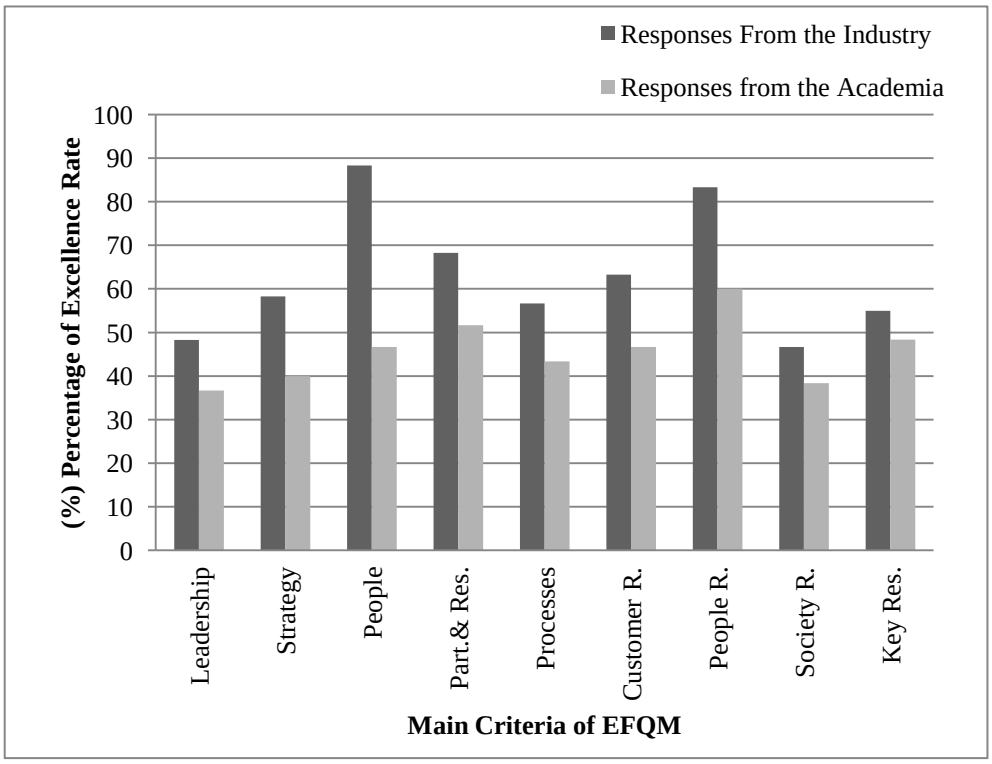

Figure 4.2: Illustration of the excellence rate results.

According to the results, excellence rates from academic remarks are lower than the industry's remarks for all criteria. It reflects clearly the differencies between two different perspectives. According to those results, it is seen that the experts from the industry think that the Turkish Ship Recycling Industry is closer to the excellence than what academia think. In addition to this, Figure 4.3 shows the overall excellence rates in respect to all responses that given to the survey.

"People" and "people results" criterion have taken the best excellence rates from the experts. Their excellence rates are respectively; 67,48% and 71,65%. It means the Turkish Ship Recycling Industry cares about their employees when comparing with the other aspects of their activities. Besides, the industry is achieved some good results already, as "People results" has higher excellence rate than the "People" criterion (an enabler criterion). However, even those rates are the highest values of the results, they are not sufficient for to be an excellent organization. "People" and "People Results" are shown in the Figure 4.4 and 4.5.

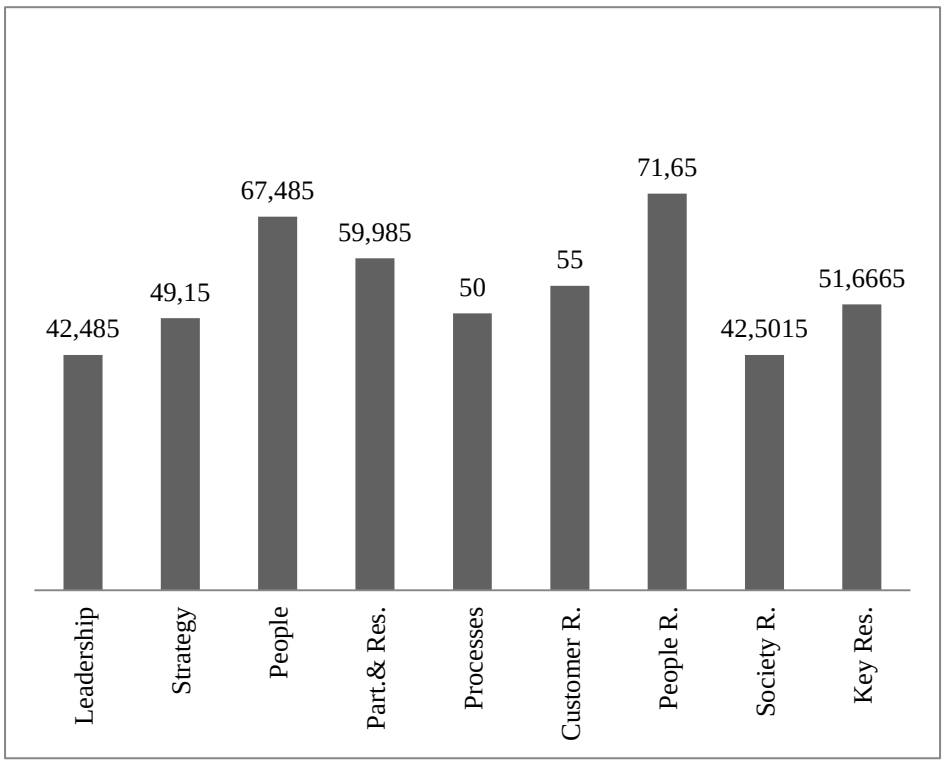

Figure 4.3: Excellence rate results in respect to all responsers.

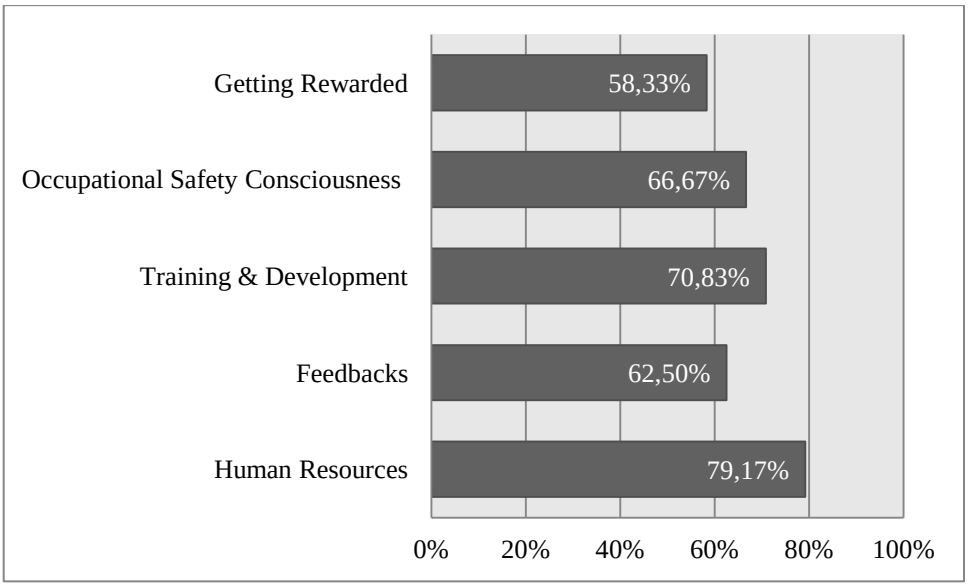

Figure 4.4: Excellence rates of the people criterion.

Human resources department is the best aspect in the people criterion despite a contradiction between the responses of academia and industry. Besides, the industry is good about ensuring of training & development services for their employees. However, employees are not getting rewarded as they had expected, but the situation is not that miserable and still improvable.

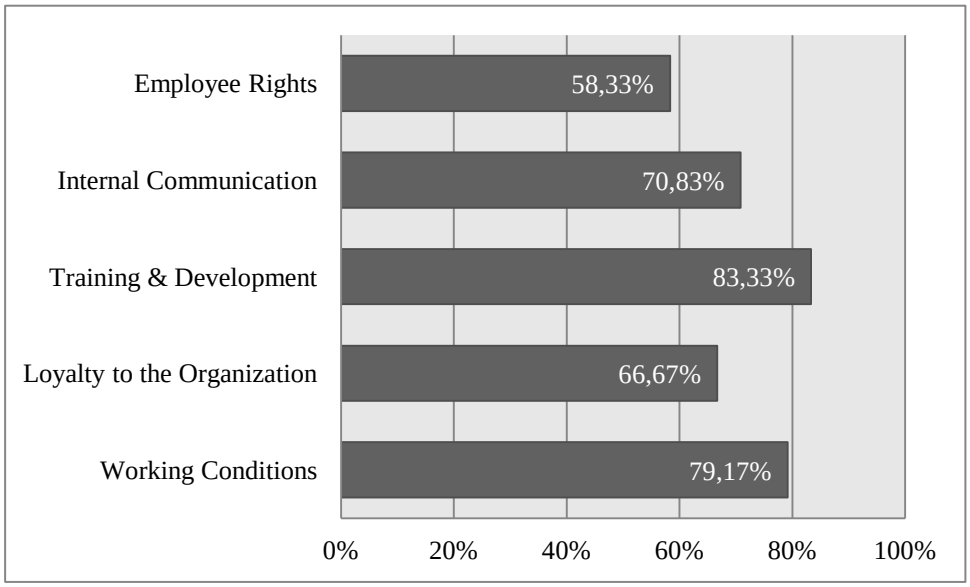

Figure 4.5: Excellence rates of the people results criterion.

Training & development is answered back to the given efforts about this area according to the "people results" criterion. Working conditions are appeared to be in course of improving and internal communication is conducted just sufficiently.

Employee rights area is not poor but it is open for to be development. The internal communication in the organizations are at good level and the employees are quite loyal to their organizations. It is beneficial to increase total experiences of the employees.

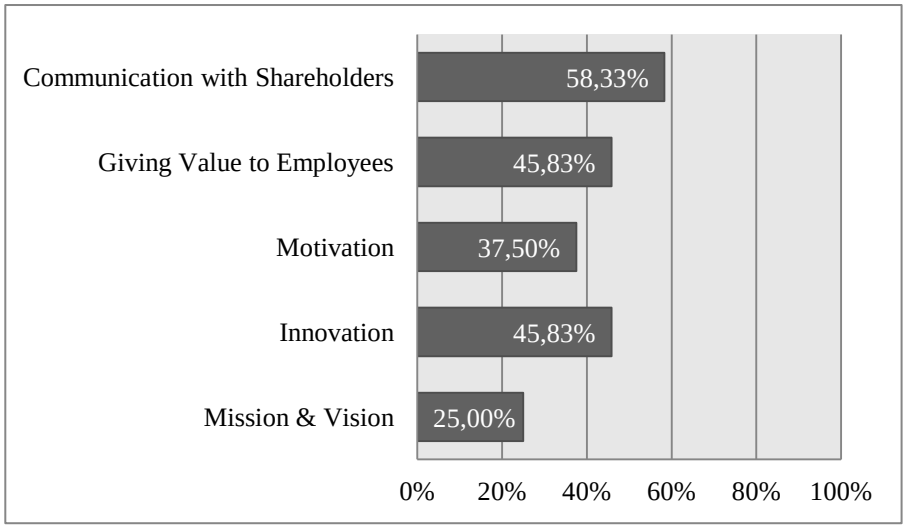

Figure 4.6: Excellence rates of the leadership criterion.

"Leadership" and "society results" criterion have taken the lowest excellence rates from the experts, which are respectively 42,48% and 42,50%. The main handicap of the leadership is"Mission & vision" skills as it is shown in the Figure 4.6:.

However, best skill of the leadership is communication with the shareholders. The results are not brilliant when taking up the subject from the point of excellence, as it signals that; leaders are acted with "save the day" strategy. Other three skills are also at poor level; leaders struggle to motivate their employees despite they make more effort on giving them value. They are also unsatisfied on the monitoring and bringing innovations to their organizations.

Excellence rates of the society results are as it is shown in Figure 4.7. It is clearly seen that cooperations with both of the universities and governmental organizations are too far away from to be excellent. Nevertheless, inspections are went well but anyhow, according to the responses; more fundamental changes need to be made for achieving the objectives of this area. Image of the ship recycling according to society about environmental aspects is at not good level, but it is upturning and despite its current rate, it is promising for the future. Neighbor relations are at poor level due to

incapability on bringing sustainable solutions in cases of disagreements and some environmental issues.

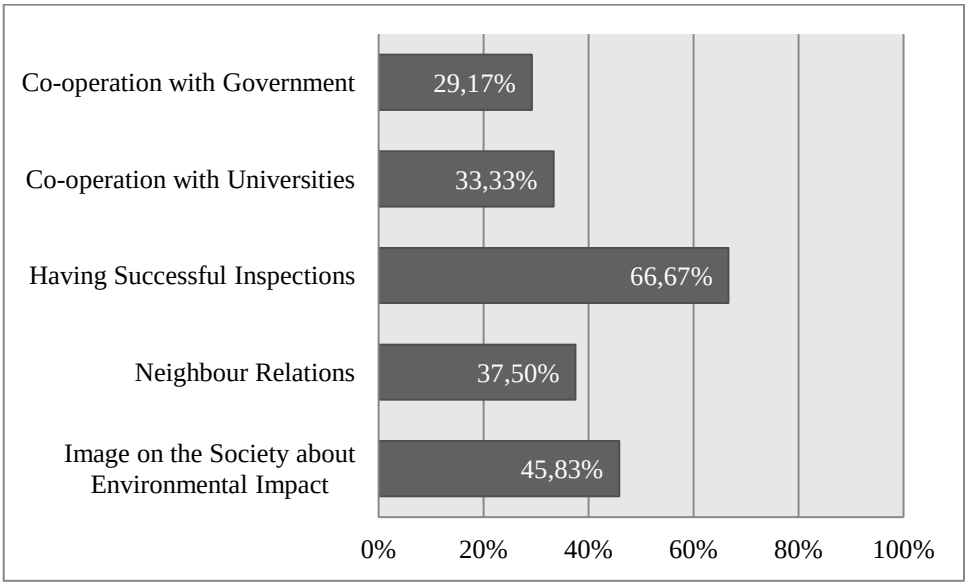

Figure 4.7: Excellence rates of the society results.

Strategy is just another criterion that the industry could not show success. As it is shown in the Figure 4.8; the organizations are not ready to make swift changes on their policy or strategy in the cases of unexpected negative impacts to the sector. Additionally, they are unable to detect those risks due to too many changeable dynamics in the market that they cannot dominate. They are not that poor on identifying strategic priorities and it is the only promising area in the strategy criterion. They are also not brilliant on working processes due to their weak capabilities about innovative movements.

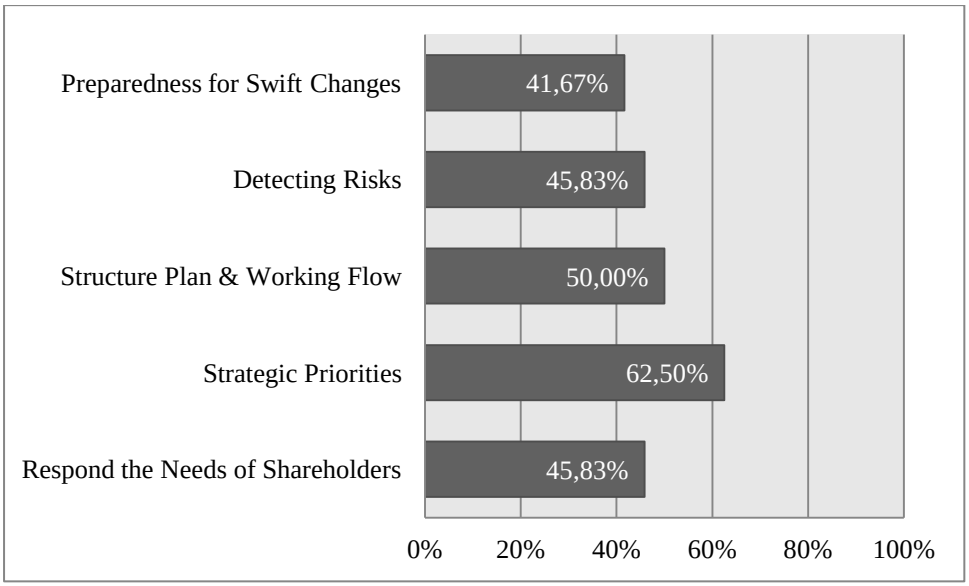

Figure 4.8: Excellence rates of the strategy criterion.

Partnerships & Resources criterion is the third best criterion of the industry with around 60% excellence rate. It is illustrated in the Figure 4.9. The organizations are promising on increasing their worker's total experience and it is matching with the loyalty of the employees, as it has satisfying value in the people results. They are taken feedbacks from shareholders and make effort for advancement in relevant issues. The Turkish Ship Recycling Industry could be considered as satisfying on environmental issues but there is still a long way to reach excellence in this area. As dependent to the poor capability on innovation; technologic infrastructure is not well. More efforts needed for the innovational background. Financial control rate is insecure and it means the industry is struggling with economic problems.

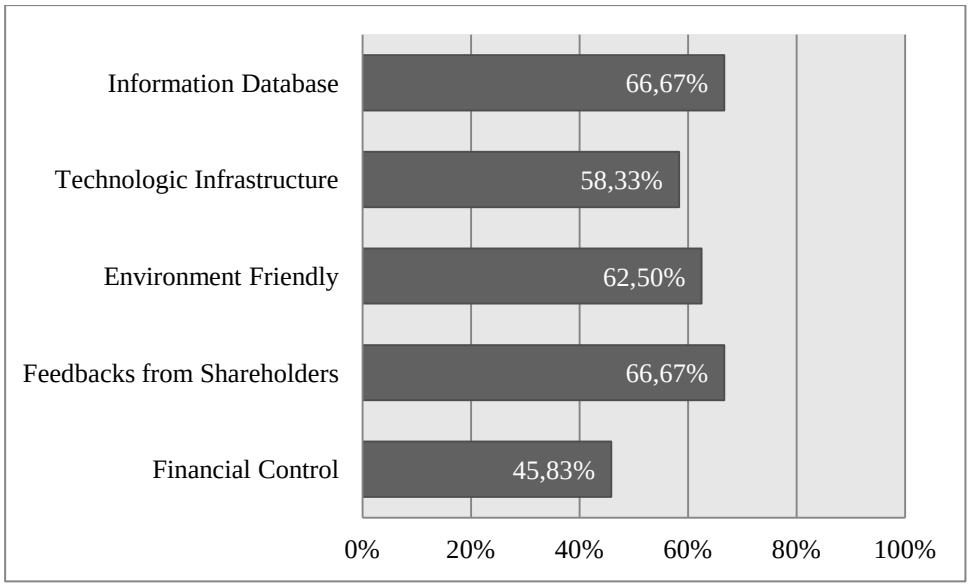

Figure 4.9: Excellence rates of the patnerships & resources criterion.

Processes criterion has 50% excellence rate and it is shown in the Figure 4.10. According to the excellence rates of the question areas; the organizations are capable to plan their processes but they seriously have inabilities when it comes to optimize them. They care about international conventions but there are still some matters that need to be solved sustainably for the upcoming conventions. They are also not good at the point of reducing inconveniences sustainably.

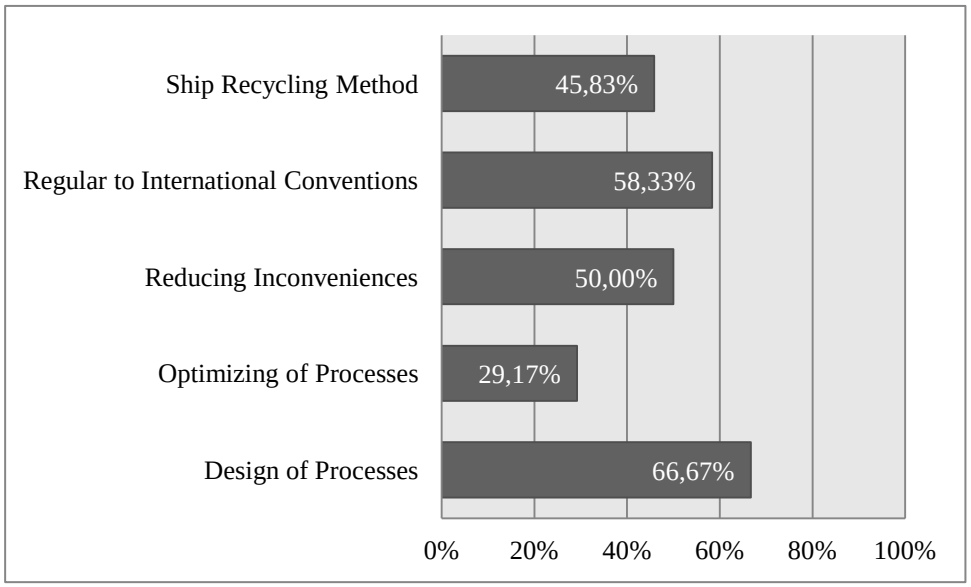

Figure 4.10: Excellence rates of the processes criterion.

"Customer results" is an above average criterion when comparing with all of the criterion in the survey. It is shown in the Figure 4.11. The ship recycling organizations are supporting their customers and brokers at good point. They are also better than the other ship recycling nations on confidency about occupational accidents. They are awared of why they are to be chosen, however they do not care their images and reputation in the sector.

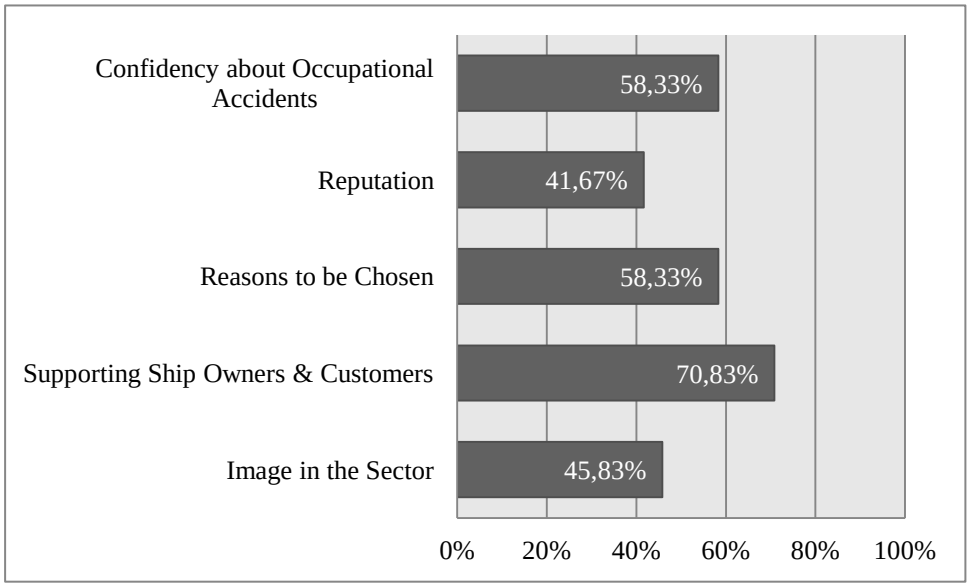

Figure 4.11: Excellence rates of the customer results criterion.

Key results has around 51,5% excellence rate and it is shown in the Figure 4.12. The Turkish Ship Recycling Organizations have good results about increasing their ship scrapping volume. They analyze, monitor and make efforts to increase their producing capacity. However, they do not achieve their objectives with permanent actions. Error rate reducing capability is not so brilliant but it is being developed even if it actualizes slowly. Investment to the information and knowledge is not satisfying due to insufficient cooperations with universities. They do not care about how much efficient their performances are and this is just another proof that total producing volume is not based on the sustainable movements. The organizations also have poor financial results and it is a deteriorating factor for the future of the industry.

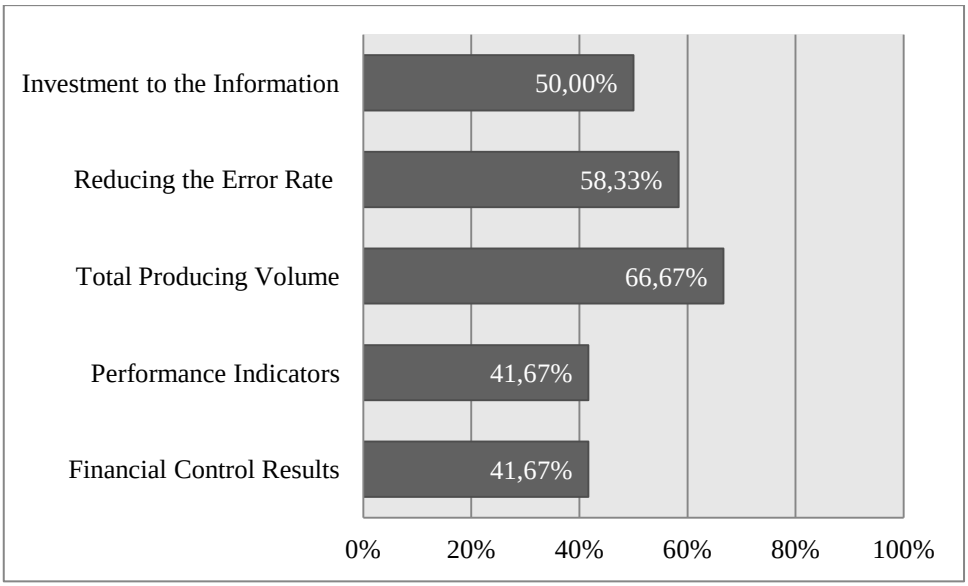

Figure 4.12: Excellence rates of the key results criterion.

As it is shown on the Table 4.11, excellence rates are transformed into the excellence scores with respect to the RADAR logic coefficients. Maximum total scores are '500' points for both enablers and results. It is '1000' points for the total excellence score.

Table 4.11: RADAR analysis results.

	Criterion	**Excellence Rate (%)**	**RADAR Coefficients**	**Scores**	**Total Scores of Enablers and Results**	**Total Excellence Score**
Enablers	Leadership	42,485	1,0	42,485	266,528	544,014
	Strategy	49,150	0,8	39,320		
	People	67,485	0,9	60,737		
	Part.& Res.	59,985	0,9	53,987		
	Processes	50,000	1,4	70,000		
Results	Customer R.	55,000	2,0	110,000	277,486	
	People R.	71,650	0,9	64,485		
	Society R.	42,502	0,6	25,501		
	Key Res.	51,667	1,5	77,500		

For enablers criteria; total excellence score is 266,528 for the Turkish Ship Recycling Industries. Results criteria have 277,486 and total excellence score 544,014. Thus, their excellence rates are as it is shown in the Table 4.12 calculated by their fulfillment rate of the maximum scores they could be taken.

Table 4.12: Excellence rates of the results.

	Maximum Scores	**Overall Excellence Rates**
Enablers	500	53,306%
Results	500	55,497%
Total	**1000**	**54,401%**

According to the Table 4.12, the Turkish Ship Recycling Industry's excellence rate is 54,40% which is an overall rate that giving ideas from a large perspective. Besides, the rate of the results criteria (55,49%) and the enablers criteria (53,30%) have closer excellence rate values; in other words, the results are consistent at this sight.

Figure 4.13 shows the distribution of judgements from the academia and Figure 4.14 shows from the industry with respect to the responses given for the survey. The rates are independent from RADAR calculation and they are illustrated for comparing these two group's perspectives in order to reveal differencies between their judgements.

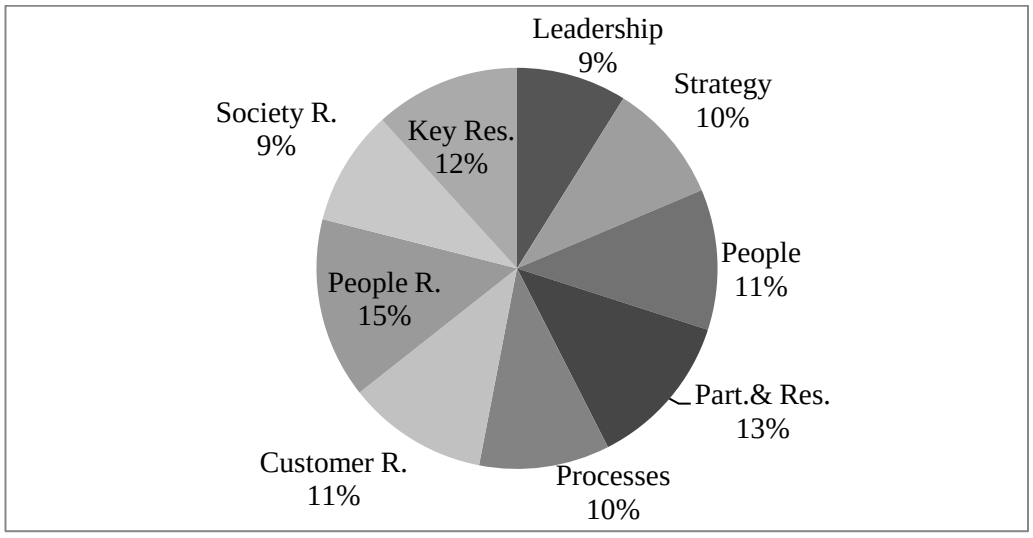

Figure 4.13: Distribution of judgements from the academia.

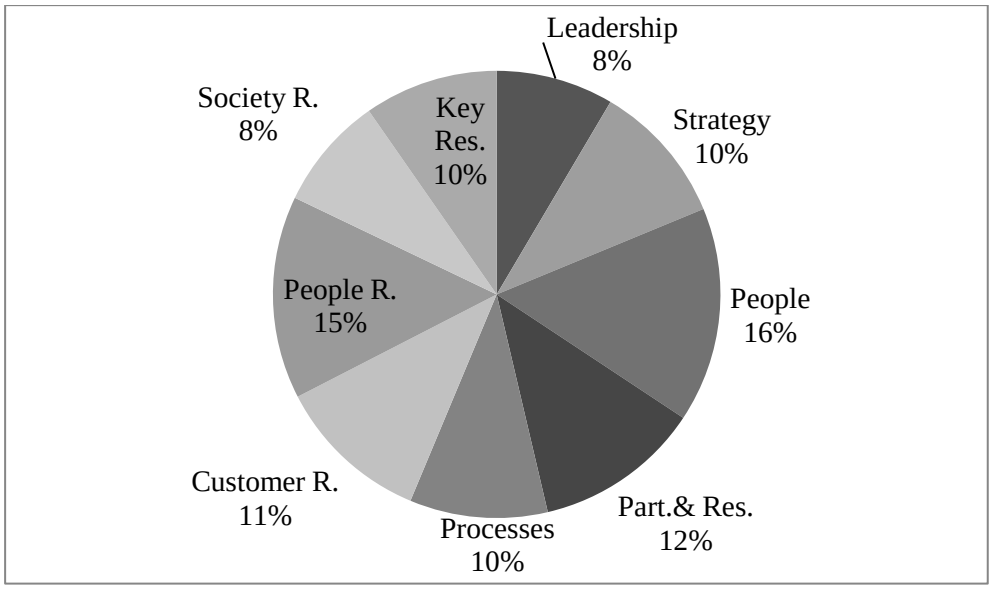

Figure 4.14: Distribution of judgements from the industry.

According to the related figures, there is not much difference between distributions of judgements despite lower values in all criteria of academic remarks. However, the only noteworthy difference signing is coming from "people" criterion by 5% rating margin. Figure 4.15 presents which areas of the leadership contain conflicts between the two judgements.

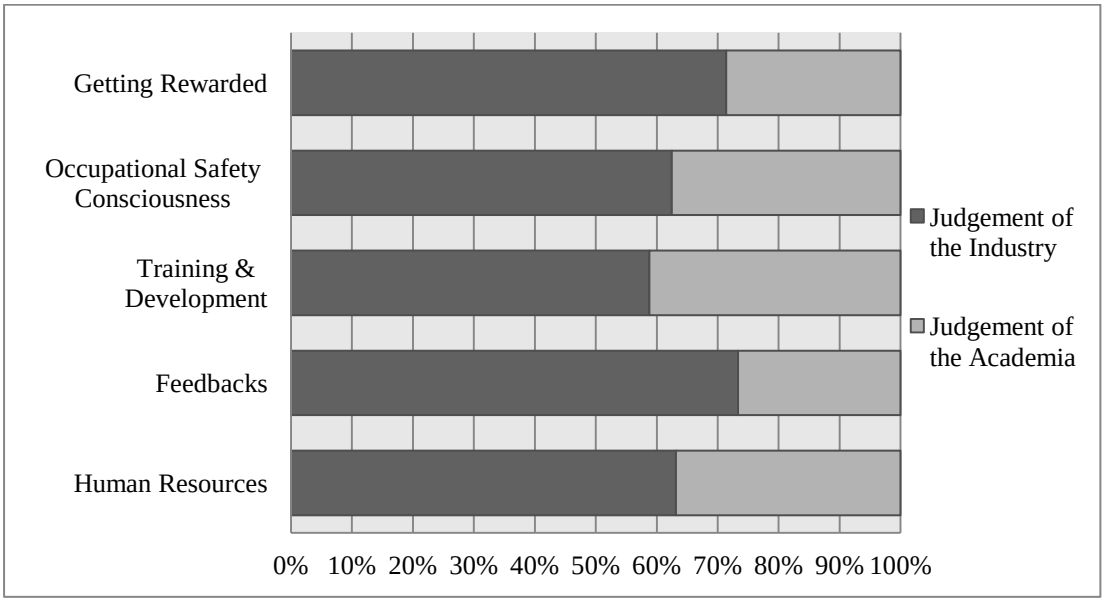

Figure 4.15: Differencies of judgements in the people criterion.

The major conflict is on the "feedbacks" area. Academic experts are in the opinion that the organizations are much worser to take feedbacks from their employees, when

compared with expert judgements from the industry. Besides, academic experts have an idea of employees are not much rewarded as what industrial experts think.

4.10 Suggest Improvements

According to the obtained results and analyzes at first sight, poor mission & vision ability in the leadership clearly gives a red alarm. It means the organizations are failed to create realistic future objectives and they act with "save the day" strategy. In other words, they do not make long-term plans and do not put comprehensive targets to achieve. According to additional researches and independent judgements from the experts; the reason for this, there are too many uncertainties in the ship scrapping, as it is difficult to have a strong idea about the future. Thus, the ship recyclers focus on short-term achievements instead of making investments to the permanent and sustainable actions that depends on barely enlightened future of the industry. One of the main uncertainties is the sensibility of the ship recycling market to the world freight market and steel scrap market. Shortly, ship recyclers are in struggle with the financial uncertainties. It is also the reason of why the organizations are failed in their "financial control" areas in the criterions of "partnership and resources" and "key results". These unsatisfied results on the finance area of the industry are a corrabotive factor for the point of this problem, as the reason of their low excellence ratings arise from nonpermanent and inadequate financial management strategy due to related uncertainties.

Another weak point is the insufficient innovative movements of the ship recycling industry leaders. It is not a shocking result when consider their lack of long-term planning abilities that combined with financial difficulties of the industry. They are awared of the sectoral innovations and technologic improvements; however, they have less desire to integrate them into their organizations' body. Apart from the financial concerns, its reason could be the excessively optimist approach of the leaders to the point, as "technologic infrastructure" area in the "partnership & resources" criterion is not as poor as it had been expected. They are appeared to be content with their current level of technologic infrastructure on this issue. In addition to this, there are considerable conflicts between the expert judgements of academia and the industry when comparing the statements that they have given. Remarks from the industry are in the direction of their advancement level of this area is quite

satisfying, while academia think the opposite. To identify the underlying reason of this conflict, it would be a good idea to browse "processes" criterion to have some additional clues. The excellence rating of "optimizing the processes" has one of the lowest values among all of the criterion areas. It is obvious that the organizations could not optimize their processes due to their bad performance on implementing innovations but they look content about that. The second worst area of the "processes" clarifies the situation: "Ship Recycling Method". Despite the organizations' awareness of the other ship recycling methods which being conducted by other relevant nations, they are unable to change their ship recycling method even they have desire to change it. Current ship recycling methods in the Turkish Ship Recycling Industry is beaching and landing. Ship recyclers are not pleased with their methods; however, they believe that they have adequate technologic infrastructure for this method. As they are awared of the primitiveness of the methods, "performance indicators" area in the "key results" criterion is supporting this idea. Performance indicators are not in an upturning direction; in short, their processes are not efficient both from the point of time and from the point of dismantling. Ship recyclers expressed that, there are many steel-made parts of the vessel were becomes waste instead of steel scrap to be recycled. As an advanced method, if the Turkish Ship Recycling Industry adopts "dry dock", a significant increase could be achieved on the all areas of the EFQM criterions. The above average excellence rating of the "design of the processes" area in the "processes" criterion is a good sign for this opinion. Even so, it stands as a formidable target through poor financial situation of the industry.

The rating of "environment friendly" area of the "partnerships & resources" criterion is at satisfied level, as this subject is one of the most highlighted matters in the ship recycling. Despite the unfavourable ship recycling methods such as beaching and landing, Turkish ship recyclers seriously take into consideration the environmental aspects. This opinion has consistency between academia and the industry; in short, all experts share the same judgement that Turkish Ship Recycling Industry is environment friendly when compared with the other relevant nations. In addition to this, not bad appearance of "being regular to ship recycling conventions" rating supports the positive performance of the industry on this subject. Even so, it must be noticed that the "image on environmental impact" rating is relatively low when

comparing with the “environment friendly” area. It could be a proof that the positive performance of the industry is raised from the poor performances of other ship recycling nations, as the asked question is based on comparison.

“Neighbor relations” is another subject to be examined, as its excellence rating is 37,5%. Most of the disagreements are originated from disorder waste management operations between the ship recycling facilities. According to the obtained information from the experts, there is lack of authority that must be organizing this working flow to remove the disarrangements on this matter. As a responsible governmental organization, the city municipilaty is to blame for this matter. The poor rating of “Co-operation with government” area of the “society results” criterion clinches this insight strongly. There is not sufficient connection between the industry and the government, as the industry is in need of financial and stabilizer supports from the government.

The excellence rating of the “Co-operation with universities” area is resulted as 33% by the consistent expressions of all experts in the study. Shortly, there are very limited cooperation between the organizations and universities to ensure sustainable development. Apart from the low ratings of “innovation” in the “leadership” criterion, “investment to the information” has also not sufficient excellence rate value when browsing the “key results”. The reason is unwillingness of the ship recyclers when it comes to share their operational data and experiences with relevant experts or academicians because of their concerns about if any tainting exposed that they already made in the past.

“Respond the needs of shareholders” area has relatively low excellence rate when compared with the “Communication with shareholders” and “Feedbacks from the shareholders” in the relevant criterions. That is to say, the organizations make effort to establish good communication with their shareholders and they take feedbacks to reveal whether their establishment on the matter is sufficient or not. However, they could not have beneficient results as much as they had expected. In the survey, brokers are recognized as one of the most important shareholder group for ship recyclers; thus, they are the crux of obtaining such result. This is because; there are a few famous brokers in the ship recycling sector who made almost all of the connections between ship owners and ship recyclers. In combined with unorganized situation of the industry, when a broker put on an obsolete vessel to be recycled to

the market, there are more than expected different ship recycling facilities competing at the same time; thus, offering prices increase at a disadvantageous point for the recyclers. Surely, this situation becomes another negative financial impact to the sector.

On the other hand, the Turkish ship recycling industry has some promising areas despite they are still open to developments. For instance, employees are trained and certified within the scope of relevant co-operated projects between Europe and related Turkish ministries; that is the reason of "training & development" area of the "people results" criterion is the best result among the survey results. The only handicap in the employee results is about motivation. The leaders are failed to encourage them with 37,5% excellence rating. Employees are nearly satisfied at "getting rewarded" area of the "people" criterion by 58,3% and they have unsatisfied by 45% on "giving value" of the leadership criterion. Those data prove that the leaders are the main responsables of the poor motivation of their employees.

According to those unveiled results; firstly, the leaders of the ship recycling organizations must be developed and professionalized by new trainings or educational programmes, as they are lack of leadership skills.

It is a very difficult obstacle to overcome for all fields of maritime sector to achieve major objectives without support of the government. As a field of the maritime, the ship recycling industry is in need of realistic support from the government especially about financial issues. Long-term credits or incentives could be a solution to help ship recyclers to achieve their urgent priorities such as adopting new ship recycling methods.

The dry-dock method of the ship recycling is known as the most advanced, most environmental friendly and the safest model when comparing with the other methods. However, establishment of this method is based on financial power. Somehow, if this method successfully implemented, it would be a magnificent locomotive for the Turkish Ship Recycling Industry. Thus, the way would be paved for innovative, systematic, professional and sustainable movements, as they have considerable potential to be realized. Otherwise, if the industry keep going without this new method; it is possible to see a sectoral downturn in the near future, according to the objective analysis of the obtained results.

As another governmental organization: municipalities must maintain an expedient order for the ship recycling zone to disambiguate the uncertainties about waste management. In addition to this, municipality must serve with free waste management implementations instead of serving with financial concerns.

Despite the active and operative associations of the sector, there are still deficiencies about the matter of organizing. For this issue, new, permanent, lawful organizing systems could be put into force by the ship recycling related units such as municipality, another governmental organizations, administrations or associations etc.

It is strongly suggested to improve co-operation with the universities or other information centers via networks. Conducted project based studies in the ship recycling zone are not much diversified between each other and more studies are needed that focused on tangible and innovative changes for the industry. In addition to this, ship recycling leaders must be encouraged to be more transparent on information sharing, as tangible results could be achieved by tangible data.

5. CONCLUSION

This study has been conducted in order to analyze the current situation of the Turkish Ship Recycling Industry, reveal its weak and strong points, as well as offer solutions and suggestions to them from the European Foundation for Quality Management Excellence model's perspective. With the purpose of identify the problems and their underlying reasons; a survey has been prepared properly for ship recycling within the frames of EFQM. For having more accurated insight to the matter; two different expert profile has been involved from the experienced persons that closely relevant to the ship recycling. One of the groups has been constituted by the experts from academia who have been studied on ship recycling for many years, and the experts from the ship recycling industry that has been taken various active roles in the activities have constituted the other one. All who has participated in the survey with their magnificent judgements are shared their experienced opinions, ideas and additional comments without any hesitate. After successfully conducted survey study, the detailed analysis has been carried out with examining both overall results and compared results. Consequently, an inspirational picture came into existence about Turkish Ship Recycling Industry's today and tomorrow.

The results indicate that, the industry has a lot of way to reach the excellence due to lack of sustainable investment to the future. The main reason is that there are too many financial uncertainties in the sector such as freight rates, offering prices to obsolete vessels and the steel scrap market. Financial weaknesses force the ship recyclers to a "save the day" policy and they focus on one-day salvations instead of long-term permanent actions. Poor leadership skills are another obtained result in addition to their financial impossibilities. With the combination of these two negative elements, the ship recycling organizations could not be developed satisfyingly due to low interest to the innovative movements. Thus, poor technological infrastructure causes poor and inefficient ship dismantling processes due to lack of innovative attempts. Besides, the organizations use landing methods of the ship recycling

reluctantly. They expressed their desire to switch to the “dry-dock” method, which is recognized as the most advanced and environmentally sound ship recycling method in the world. Moreover, there also some problems on the organizing abilities of the ship recycling facilities, as they are inadequate when it comes to sharing brokers, shortly; obsolete vessels. This is another negative factor about their finances; this is because unnecessary rivalry causes an escalation on the offer prices. In addition to this, there are some disagreements are risen up about waste management due to lack of authority and maintaining order ability of the local governmental organization such as the relevant municipality.

The model is satisfyingly compatible with the study; however, there are some unfitted areas that have been experienced. It would be more proper to apply the model to one ship recycling organization instead of the whole industry. In addition to this, ship recycling industy have some specific features that it is very difficult to adapt the model to the industry. Despite those difficulties, considerably high noteworthy results have been founded.

According to those findings, it is suggested that the ship recycling industry must be supported especially in the financial matters by the government. This could be by long-term credits with low interest or other subvention methods such as incentives to help and encourage ship recyclers about adopting dry-dock method and the other innovative actions. In these circumstances, the industry is appeared to be very vulnerable if global crisis outbreaks. This is one of the weakest spots of the Turkish ship recycling organizations, which must be strengthened immediately.

Dry dock method is considered to be crucial for the future of the sector, because it is simply a new era for the ship recycling and it has potential influence about almost all relevant aspects such as increased performance, rapid scrapping ability, more suitable innovation actions to innovations, safer working conditions, more environmental friendly ship dismantling activities etc.

The financial difficulty has another reason for Turkish ship recyclers, which is can be called as “South Asia effect”. With low working conditions and inadequate environmental standards, South Asian ship recycling organizations (which, they conduct 70% of ship dismantling in the world) find opportunity to offer higher prices for obsolete vessels than Turkish ship recycling organizations do. International

authorities must regularize harmful-but-cheap ship recycling activities of Asian countries in a realistic way. The HK Convention is aimed to put some important standarts to the industry for environmentally sound and safe ship recycling. Even so, it is not expected to entry in to force before many years due to its "entry into force criteria". Turkish ship recycling organizations have much better appearance on meeting the requirements of the upcoming regulations and this is a promising point for the industry. In other words, Turkish ship recycling is ready for the HK Convention currently. Summarily, Turkey will gain many advantages when the HK Convention takes effect, however, the industry has potential to downturn substantially if no improvement and supporting come until the HK Convention entries into force.

Leaders' lack of leadership skills is a threat for the future of the industry. It must be enhanced with the new realistic education programmes or trainings about advanced management. Their limited mission&vision skills stand as an obstacle in the way of excellence. Naturally, external factors such as financial matters may affect when transforming the theoric intentions into practical actions. Even so, according to conducted field survey, they are also poor about their approachments on mission & vision. They are also failed about motivating their employees properly. As an external factor to the subject, unsatisfying wages of the employees can be counted, which is very important for them to maintain their lives. However, leaders are not satisfying when browsing their approachment in this subject too.

An advanced order maintainer organization must be established, or current responsible organizations must be improved to maintain the order in the ship-recycling zone on the matters of waste management. Ship recyclers expressed their complaining about the way of current implementations that are carried out by municipality units. However, despite the disagreements and disorder about waste management between the organizations and municipality, waste management of Turkish ship recycling facilities are appeared to be satisfying enough when comparing the other nations' facilities. This is just another promising point of Turkish ship recycling, as they stand more preferable with these advantages.

When seeking the underlying problems of poor neighbor relationships, an attentive point is also revealed as it is considered the main problem of such disagreements. According to the additional comments of some experts, Aliaga ship recycling zone

has too many ship recycling companies regarding to the total area of the industry. When comparing with the other ship recycling nations, Turkish ship recycling industry remains weaker about this issue. The suggestion is; the Turkish government must provide financial incentives in order to give encouragement and lead way to the organizations about “merging” between them.

An internal factor that negatively affecting the profits of ship recyclers. Solution of this matter completely depends on the organizing capability of Turkish ship recyclers. They highlighted about unnecessary rivalry happens when offering bids to the obsolete vessels at times. The reason is, unorganized price offering style. For one vessel, a couple of recycling organizations bid and offering prices are increased. It causes a reducing in the profits of ship recyclers while the profits of ship owners increase. However, for many cases, this rivalry is unnecessary. Because, Turkey has no real alternative nation about ship recycling when considering its geoghraphic location.

Co-operation with universities must become widespread and required networks must be established in order to conduct more various and tangible studies. Recent years, there are some progressing has been recorded in this area through some projects such as ShipDIGEST. Anyhow, co-operation level between organizations and universities is still poor and not promising. The main reason is ship-recycling organizations do not act in transperancy about iformation exchange. Furtherly, they remain insufficient on recording the operational issues such as accidents and error occurances. This situation has already reflected to the survey responses and results accordingly. Thus, the organizations must ensure transparency about information sharing with the related experts or academicians to have more accurate and expedient studies that are designated to enlighten the future of the ship recycling industry. At the same time, relevant supervisors must implement a developed error recording system responsibly to achieve sustainable development towards excellence in the processes.

This study has a contribution to the literature, as it stands as the first study that applying EFQM model to ship recycling industry. There are many applications of the EFQM to the study areas of medicine, employee motivation, safety & security,

education & training, construction sector, tourism etc. However, there are not many applications in the maritime fields.

For further studies, European ship recycling methods, technics and innovations could be examined in order to reveal differencies about the industry. That's why, with the new conventions upcoming; an advanced European ship-recycling model may be implement to Turkey as a "ship recycler of the Europe" due to Turkey's geographic location and its better appearance about human health and environmental issues. In addition to the further studies, EFQM model could be applied to just one ship recycling organization to create excellence for one organization, which could be the best guide for other ship recycling organizations.

REFERENCES

Abdullah, H. M., Mahboob, M. G., Banu, M. R., Seker, D. Z. (2013). Monitoring the drastic growth of ship breaking yards in Sitakunda: a threat to the coastal environment of Bangladesh. *Environmental Monitoring and Assesment*, 185, 3839- 3851.

Arjomandi, M., Kestell, C., & Grimshaw, P. (2009). An EFQM Excellence Model for higher education quality assessment, (2004), 1015–1020.

Arslan, O., Kurt, R.E., McKenna, S., Kececi, T. (2013). EU Project: Ship DIGEST and the role of Aliaga Ship-Recycling Company on development of Turkish ship-dismantling industry. *Proceedings from the International Conference on Ship Recycling*, 7-9 April, Sweden.

Aydin, S., Kahraman, C., & Kaya, İ. (2012). A new fuzzy multicriteria decision making approach: An application for European Quality Award assessment. *Knowledge-Based Systems*, *32*, 37–46. doi:10.1016/j.knosys.2011.08.022

Black, S. A., Meredith, H. M. R., & Groombridge, J. J. (2011). Biodiversity conservation: Applying new criteria to assess excellence. *Total Quality Management & Business Excellence*, *22*(11), 1165–1178. doi:10.1080/14783363.2011.624766

Cafoglu, Z. (1996). Egitimde Toplam Kalite Yonetimi. *Avni Akyol Umit Kultur ve Egitim Vakfi Yayinlari*, No: 3, Istanbul, 1996.

Chang, Y. C., Wang, N., Durak, O.S. (2010). Ship recycling and marine pollution. *Marine Pollution Bulletin.* 60, 1390- 1396.

Demaria, F. (2010). Shipbreaking at Alang-Sosiya (India): An ecological distribution conflict. *Ecologic Economics*, 70(2), 250-260.2010.09.006.

Deshpande, P. C., Tilwankar, A.K, Asolekar, S.R. (2012). A novel approach to estimating potential maximum heavy metal exposure to ship recycling yard workers in Alang, India. *The Scinece of the Total Environment*, 438, 304-11, 2012.08.048.

Ehrlich, C. (2006). The EFQM-model and work motivation. *Total Quality Management & Business Excellence*, *17*(2), 131–140. doi:10.1080/14783360500450400

Erol, E. (1993). Yonetim ve Organizasyon, *Beta Basim Yayim A.S*, Istanbul, pp: 667.

Erturgut, R., & Soyşekerci, S. (2009). The problem of sustainability of organizational success in public educational institutions: a research on the education administrators in Turkey. *Procedia - Social and Behavioral Sciences, 1*(1), 2092–2102. doi:10.1016/j.sbspro.2009.01.368

Ersun, S. (1994). Kalite Ustadlari. *Once Kalite Dergisi*, (7), pp: 22-24.

Garud, P. (2012)**.** Incorporation of global environmental norms into Indian legal systems: Social and economic challenges, with special reference to ship-breaking. *International Conference on Emerging Economies – Prospects and Challenges (ICEE-2012). Social and Behavioral Sciences*, 37 (2012), 150- 156.

Garvin, D.A. (1988). Managing Quality. The Strategic and Competitive Edge. *The Free Press A Division of Macmillian. Inc. New York,* 1988.

IMO. (2009). Adoption of the final act and any instruments, recommondations and resoulations resulting from the work of the conference, *International Conference on the Environmentally Sound Recycling of Ships.* SR/CONF/45, 2009.05.

Islam, K. L. and Hossain, M. M. (1986). Effect of ship scrapping activities on the soil and sea environment in the coastal area of Chittagong. *Marine Pollution Bulletin*. Vol. 17, No. 10, pp 462-463.

Kalder. (2010). EFQM Mukemmellik Modeli El Kitapcigi 2010. *Turkiye Kalite Dernegi*.

Kaufman, R., Zahn, D. (1993). Quality Management Plus: The Continious Improvement of Education. *Corwin Press. Inc.* 1993

Knapp, S., Kumar, S.N., Remijn, A.B. (2008). Econometric analysis of the ship demolition market, *Marine Policy*, 32(6), 1023-1036.2008.02.004.

Krause, K. (2005). End-of-life ships – linking European maritime safety to occupational safety on Asian scrap yards, R. Allsop, J. Beckmann, G.M. Mackay, Editors , *ETSC Yearbook 2005, Safety and Sustainability, European Transport Safety Council,* Brussels (2005) pp. 76- 80.

Langewiesche, W. (2000). The Shipbreakers. *The Atlantic Monthly,* Vol: 286, No.2; pp: 31-49.

Mariscal, M. A., Herrero, S. G., & Toca Otero, A. (2012). Assessing safety culture in the Spanish nuclear industry through the use of working groups. *Safety Science*, *50*(5), 1237–1246. doi:10.1016/j.ssci.2012.01.008

Marques, A. I., Santos, L., Soares, P., Santos, R., Oliveira-tavares, A., Mota, J., & Carvalho, J. (2011). A proposed adaptation of the European Foundation for Quality Management Excellence Model to physical activity programmes for the elderly - development of a quality self-assessment tool using a modified Delphi process, 1–9.

Martin, C., Bulkan, A., & Klempt, P. (2011). Security excellence from a total quality management approach. *Total Quality Management & Business Excellence*, *22*(3), 345–371. doi:10.1080/14783363.2010.545556

Masaki, I. (1997). Kaizen. *Kalder Yayinlari*, Istanbul, pp: 6.

Mevzuat Dergisi. (2002). Toplam Kalite Yönetimi. *Mevzuat Dergisi*, ISSN: 1306-0767, Yil: 5, Sayi: 55, Temmuz 2002.

Mikelis, N. (2013). Ship recycling markets and the impact of the Hong Kong Convention. *International Conference on Ship Recycling*; World Maritime University; Malmo; 7-9 April.

Nabitz, U., Klazinga, N., & Walburg, J. (2000). The EFQM excellence model: European and Dutch experiences with the EFQM approach in health care. *International Journal for Quality in Health Care*, *12*(3), 191–202. doi:10.1093/intqhc/12.3.191

Neser, G., Unsalan, D., Tekogğul, N. and Stuer-Lauridsen, F. (2008). The Shipbreaking Industry in Turkey: environmental, safety and health issues. *Journal of Cleaner Production* 16, 350-358.

Neser, G., Kontas, A., Unsalan, D., Uluturhan, E., Altay, O., Darilmaz, E., Kucuksezgin, F., Tekogul, N., Yercan, F. (2012). Heavy metals contaminaton levels at the Coast of Aliağa (Turkey) ship recycling zone. *Marine Pollution Bulletin*, 64, 882- 887.

Onder, E., Tas, N., Hepsen A. (2014). Economic Performance Evaulation of Fragile 5 Countries after the Great Recession of 2008-2009 Using Analytic Network Process and TOPSIS Methods. *The Clute Institutional Business & education Conferences*, August 3-7, 2014, San Francisco, 325-1:325:14.

Reddy, M.S., Basha, M., Kumar, V.G.S., Joshi, H.V., Ghosh, P.K. (2003). Quantification and classification of ship scrapping waste at Alang-Sosiya, India. *Marine Pollution Bulletin*, 46(12), 1609-14, doi:10.10.16/S0025-326X(03)00329-1.

Reddy, M.S., Basha, S., Joshi, H.V., Ramachandraiah, G. (2005). Seasonal distribution and contamination levels of total PHCs, PAHs and heavy metals in coastal waters of the Alang-Sosiya ship scrapping yard, Gulf of Cambay, India. *Chemosphere* 61, (2005), 1587- 1593

Saat, M. (2000). Kalite Denetiminde Toguchi Yaklasimi. *Gazi Universitesi IIBF Dergisi*, 2 (3), pp: 126- 143.

Samiotis, G., Charalampous, K., Tselentis, V.S. (2013). Recent developments in the institutional framework of ship recycling and the positive impact on international ship dismantling practices. *Journal of Economics and Business*, Vol. 63 (2013), Issue 3-4, pp. 158- 171.

Schulling, J. (2005). End of life ships: The human cost of breaking ships. *Greenpeace International and FIDH.*

Shewhart, W.A. (1931). Economic Control of Quality of Management Product, *D. Van Nostrand Company. Inc*, 1931.

Shimuzu K., Nakajo, Y., Yaer, X., Kato, K., Kijima, T., Teraoka, I. and Teramachi, H. (2012). Advanced ship recycling system. *Advanced Materials Research*, Vols: 356-360, pp: 1827-1830

Sivaprasad, K. (2010). Development of best practices for ship recycling processes, *Department of Ship Technology Cochin University of Science and Technology 682022*, December 2010.

Sivaprasad, K., Nandakumar, C. G. (2013). Design for Ship Recycling. *Ships and Offshore Structures.* Vol. 8, No. 2, 214- 223.

Sozuer, A. (2011). Self assessment as a gate to performance improvement: A study on hospitality management in Turkey. *Procedia - Social and Behavioral Sciences*, *24*, 1090–1097. doi:10.1016/j.sbspro.2011.09.060

Tarí, J. J., & Sabater, V. (2006). Human aspects in a quality management context and their effects on performance. *The International Journal of Human Resource Management*, *17*(3), 484–503. doi:10.1080/09585190500521557

Terao, T. (2011). From shipbreaking to ship recycling: the relocation of recycling sites and the expanding international approach. *Economic Integration and Recycling in Asia: An Interim Report, Chosakenyu Hokokusho*, Institute of Developing Economies; 2011; pp 113-127.

Tunarli, V., Fet, A.M. (2013). Improved stakeholder management in Aliaga ship-recycling yards of Turkey. *Proceedings from the International Conference on Ship Recycling*, 7-9 April, Sweden.

Tuncel, G., Muezzinoglu, A., Tuncel, B., Bayram, A., Odabasi, M., Elbir, T., Sofuoglu, S., Pekey, B., Pekey, H., Seyfioglu, R., Zararsiz, A., Dumanoglu, Y., Kirmaz, R., Abdulkarim, S., Dogan, G., Yilmaz, M. (2008). İzmir aliaga bolgesinde hava kirliligine neden olan organik ve inorganik kirleticilerin duzeylerinin, kaynaklarinin ve saglik etkilerinin belirlenmesi, *TUBITAK Project*, Project No: 104Y276. Dated: 08.12.2014.

Tutuncu, O., & Kucukusta, D. (2007). Relationship between Organizational Commitment and EFQM Business Excellence Model: A Study on Turkish Quality Award Winners. *Total Quality Management & Business Excellence*, *18*(10), 1083–1096. doi:10.1080/14783360701594709

Varis, J.P. (2002). The suitability of round clinching tools for high strength structural steel. *Thin-Walled Structures,* 40, 225-238.

Varol, K. (1993). Topyekun Kalite Yonetimi. *TUSIAD Gorus Dergisi*, (12), pp. 26-30.

Word Steel Association. (2012). Sustainable steel: at the core of a green economy. *ISBN 978-2-930069-67-8.*

Wu, W., Lin, Y., Shiue, H., Li, C., Tsai, P., Yang, C., Liou, S., Wu, T. (2014). Cancer incidence of Taiwanese shipbreaking workers who have been potentially exposed to asbestos, *Environmental Research,* 132 370-8, 2014.04.026.

Zadeh, M. (2011). Using analysis varience for measuring excellence in a construction company: Based on the EFQM model, *Asian Journal of Applied Sciences,* ISSN 1996-3343 / DOI: 10.3923/ajaps. 2011, Malaysia.

Basel. (2011). Joint ILO/IMO/Basel Convention Working Group on Ship Scrapping. Date Retrieved: 04.11.2014, address: http://www.basel.int/Implementation/ShipDismantling/LegalAspects/JointILOIMOBCWorkingGroup/tabid/2765/Default.aspx

BAN. (2011). Basel Action Network. Date Retrieved: 05.10.2014, address: http://www.ban.org/

DIVEST. (2014) Dismantling of vessels with enhanced safety and technology. Date Retrieved: 01.120.2014, address: http://www.divest-project.eu/

EFQM. European Foundation for Quality Management. (2014). Date Retrieved: 11.10.2014, address: http://www.efqm.org/

European Union. (2009). A strategy for better ship dismantling practices. Date Retrieved: 14.10.2014, address:

http://europa.eu/legislation_summaries/environment/waste_management/ev0011_en.htm

Friends of the Earth. (2014). Friends of the earth. Date Retrieved: 25.11.2014, address: http://www.foe.co.uk/

Google. (2014). Google maps. Date Retrieved: 11.12.2014, address: https://www.google.com/maps/place/Alia%C4%9Fa,+T%C3%BCrkiye/@38.8291219,26.9307653,1841m/data=!3m1!1e3!4m2!3m1!1s0x14ba304605416a23:0xa3901eb7112b67fe

Greenpeace. (2014). Greenpeace International. Date Retrieved: 24.11.2014, address: http://www.greenpeace.org/international/en/

IMO. (2014). The development of Hong Kong Convention. Date Retrieved: 01.10.2014, address: http://www.imo.org/OurWork/Environment/ShipRecycling/Pages/Default.aspx

ILO. (2014). International Labour Organization. Date Retrieved: 12.09.2014, address: http://www.ilo.org/

Kumar, R. (2011). *Ship Dismantling - A Status Report on South Asia*. Date retrieved: 12.09.2014, Retrieved from: http://www.shipbreakingplatform.org/shipbrea_wp2011/wp-content/uploads/2013/07/ship_dismantling_en.pdf

Recyship. (2013). Project Progress. Date Retrieved: 01.12.2014, address: http://www.recyship.com/

Robin des Bois. (2014). Non Governmental Organization fort he Protection of man and the environment. Date Retrieved: 25.11.2014, address: http://www.robindesbois.org/

Ship DIGEST. (2014). Ship dismantling insight by generating environmental and safety training. Date Retrieved: 01.11.2014, address: http://www.shipdigest.eu/

ShipDismantl. (2014). Cost effective and environmentally sound dismantling of obsolete vessels. Date Retrieved: 01.12.2014, address: http://www.transport-research.info/web/projects/project_details.cfm?id=35669

Shipbreaking Platform. (2014). Ngo Shipbreaking Platform. Date Retrieved: 24.11.2014, address: http://www.shipbreakingplatform.org/

SHIPMATES. (2012). Ship repair to maintain transport which is environmentally sustainable. Date Retrieved: 01.12.2014, address: http://ec.europa.eu/research/transport/projects/items/shipmates_en.htm

Thecqi. (2014). The Chartered Quality Institute. Date Retrieved: 20.11.2014, address: http://www.thecqi.org/

YPSA. (2012). Death Trap. Date retrieved: 12.09.2014, address: http://www.shipbreakingbd.info/death_trap.html

APPENDICES

APPENDIX A: Outputs of RADAR Scoring Matrix

APPENDIX B: Enablers of RADAR Scoring Matrix

APPENDIX C: Judgements of the Academia

APPENDIX D: Judgements of the Industry

APPENDIX E: Excellence Rate Calculation of Leadership Criterion

APPENDIX-A

Table A.1: Outputs of RADAR scoring matrix.

Elements		**0%**	**25%**	**50%**	**75%**	**100%**
Results	***Trends*** -Trends are positive AND/OR -There is sustained good performance	No Results or anecdotal information	Positive trends and/or satisfactory performance for about 1/4 of results over at least 3 years	Positive trends and/or sustained good performance for about 1/2 of results over at least 3 years.	Positive trends and/or sustained good performance for about 3/4 of results over at least 3 years.	Positive trends and/or sustained good performance for all results over at least 3 years.
	Targets -Targets are achieved -Targets are appropriate	No Results or anecdotal information	Achieved and appropriate for about 1/4 of results	Achieved and appropriate for about 1/2 of results.	Achieved and appropriate for about 3/4 of results.	Achieved and appropriate for all results.
	Comparisons -Results compare well with others AND/OR -Results compare well with acknowledged 'World Class'	No Results or anecdotal information	Favourable comparisons for about 1/4 of results	Favourable comparisons for about 1/2 of results.	Favourable comparisons for about 3/4 of results.	Favourable comparisons for all results.
	Causes -Results are caused by approach	No Results or anecdotal information	Cause and effect visible for about 1/4 of results	Cause and effect visible for about 1/2 of results.	Cause and effect visible for about 3/4 of results.	Cause and effect visible for all results.
Elements		**0%**	**25%**	**50%**	**75%**	**100%**
Scope	***Scope*** -Results address relevant areas -Results are appropriately segmented e.g. by cutomers, by business	No Results or anecdotal information	Results address 1/4 of relevant areas and activities	Results address 1/2 of relevant areas and activities	Results address 3/4 of relevant areas and activities.	Results address all of relevant areas and activities

APPENDIX-B

Table B.1: Enablers of RADAR scoring matrix.

Elements		**0%**	**25%**	**50%**	**75%**	**100%**
Approach	***Sound*** -Approach has a clear rationale -Approach has defined processes -Approach focuses on stakeholder needs ***Integrated*** -Approach supports policy and strategy -Approach is linked to other approaches as appropriate	No evidence or anecdotal	Some evidence	evidence	Clear evidence	Comprehensive evidence
Deployment	***Implemented*** -Approach is implemented ***Systematic*** -Approach is deployed in a structured way with the method used for deployment being planned and executed soundly	No evidence or anecdotal	Some evidence	evidence	Clear evidence	Comprehensive evidence
Assessment & Review	***Measurement*** -Regular measurement of the effectiveness of the approach is carried out -Regular measurement ofthe effectiveness of the deployement is carried out -Measures selected are appropriate ***Learning*** İs used to: -Identify best practice and improvement opportunities ***Improvement*** -Output from measurement and learning is analyzed and used to: -Identify, prioritize, plan and implement improvements	No evidence or anecdotal	Some evidence	evidence	Clear evidence	Comprehensive evidence

APPENDIX-C

Table C.1: Judgements of academia: Leadership.

	Criterion 1: Leadership	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Mission & Vision	Evidence	Some Evidence	Limited Evidence
2	Innovation	Some Evidence	Evidence	Limited Evidence
3	Motivation	Evidence	Some Evidence	Some Evidence
4	Giving Value to Employees	Evidence	Evidence	Some Evidence
5	Communication with Shareholders	Clear Evidence	Evidence	Evidence

Table C.2: Judgements of academia: Strategy.

	Criterion 2: Strategy	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Meeting the Needs of Shareholders	Evidence	Evidence	Some Evidence
2	Strategic Priorities	Some Evidence	Evidence	Some Evidence
3	Structure Plan & Working Flow	Evidence	Evidence	Some Evidence
4	Detecting Risks	Evidence	Some Evidence	Evidence
5	Swift Changes	Evidence	Evidence	Some Evidence

Table C.3: Judgements of academia: People.

	Criterion 3: People	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Human Resources Policy	Evidence	Clear Evidence	Evidence
2	Taking Feedbacks from Employees	Some Evidence	Evidence	Some Evidence
3	Training & Development	Evidence	Clear Evidence	Evidence
4	Occupational Safety Consciousness	Evidence	Evidence	Evidence
5	Rewarding the Employees	Some Evidence	Some Evidence	Evidence

Table C.4: Judgements of academia: Partnership & resources.

	Criterion 4: Partnership & Resources	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Financial Control	Evidence	Evidence	Some Evidence
2	Taking Feedbacks from Shareholders	Clear Evidence	Clear Evidence	Evidence
3	Environmental Friendliness	Clear Evidence	Evidence	Evidence
4	Technologic Infrastructure	Evidence	Evidence	Some Evidence
5	Information Database	Evidence	Evidence	Evidence

Table C.5: Judgements of academia: Products, processes & services.

	Criterion 5: Products, Processes & Services	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Design of Processes	Evidence	Evidence	Evidence
2	Optimizing of Processes	Evidence	Some Evidence	Some Evidence
3	Reducing Inconveniences	Some Evidence	Some Evidence	Evidence
4	Regular to International Conventions	Clear Evidence	Evidence	Evidence
5	Ship Recycling Method	Some Evidence	Evidence	Evidence

Table C.6: Judgements of academia: Customer results.

	Criterion 6: Customer Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Image in the Sector	Evidence	Evidence	Some Evidence
2	Supporting Ship Owners & Customers	Evidence	Some Evidence	Clear Evidence
3	Reasons to be Chosen	Some Evidence	Clear Evidence	Evidence
4	Reputation	Some Evidence	Evidence	Some Evidence
5	Confidency about Occupational Accidents	Clear Evidence	Evidence	Evidence

Table C.7: Judgements of academia: People results.

	Criterion 7: People Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Employee Rights	Clear Evidence	Evidence	Clear Evidence
2	Internal Communication	Evidence	Evidence	Evidence
3	Training & Development	Clear Evidence	Clear Evidence	Clear Evidence
4	Loyalty to the Organization	Clear Evidence	Clear Evidence	Clear Evidence
5	Working Conditions	Some Evidence	Evidence	Some Evidence

Table C.8: Judgements of academia: Society results.

	Criterion 8: Society Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Cooperation with Government	Evidence	Some Evidence	Evidence
2	Cooperation with Universities	Evidence	Evidence	Limited Evidence
3	Inspections	Clear Evidence	Clear Evidence	Evidence
4	Neighbour Relations	Some Evidence	Evidence	Limited Evidence
5	Image on the Society about Environmental Impact	Evidence	Some Evidence	Limited Evidence

Table C.9: Judgements of academia: Key results.

	Criterion 9: Key Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Investment to the Information	Evidence	Evidence	Some Evidence
2	Reducing the Error Rate	Evidence	Some Evidence	Some Evidence
3	Total Producing Volume	Clear Evidence	Clear Evidence	Evidence
4	Performance Indicators	Evidence	Evidence	Evidence
5	Financial Control Results	Clear Evidence	Evidence	Some Evidence

APPENDIX-D

Table D.1: Judgements of industry: Leadership.

	Criterion 1: Leadership	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Mission & Vision	Evidence	Some Evidence	Limited Evidence
2	Innovation	Clear Evidence	Clear Evidence	Evidence
3	Motivation	Evidence	Evidence	Some Evidence
4	Giving Value to Employees	Evidence	Evidence	Evidence
5	Communication with Shareholders	Clear Evidence	Clear Evidence	Some Evidence

Table D.2: Judgements of industry: Strategy.

	Criterion 2: Strategy	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Swift Change	Evidence	Some Evidence	Clear Evidence
2	Detecting Risks	Comprehensive Evidence	Comprehensive Evidence	Clear Evidence
3	Structure Plan & Working Flow	Comprehensive Evidence	Evidence	Some Evidence
4	Strategic Priorities	Clear Evidence	Some Evidence	Evidence
5	Meeting the Needs of Shareholders	Evidence	Evidence	Some Evidence

Table D.3: Judgements of industry: People.

	Criterion 3: People	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Human Resources Policy	Comprehensive Evidence	Comprehensive Evidence	Comprehensive Evidence
2	Taking Feedbacks from Employees	Comprehensive Evidence	Clear Evidence	Comprehensive Evidence
3	Training & Development	Comprehensive Evidence	Clear Evidence	Clear Evidence
4	Occupational Safety Consciousness	Comprehensive Evidence	Clear Evidence	Clear Evidence
5	Rewarding the Employees	Comprehensive Evidence	Clear Evidence	Clear Evidence

.

Table D.4: Judgements of industry: Products, processes & services.

	Criterion 4: Partnership & Resources	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Financial Control	Evidence	Evidence	Evidence
2	Taking Feedbacks from Shareholders	Clear Evidence	Clear Evidence	Evidence
3	Environmental Friendliness	Comprehensive Evidence	Evidence	Evidence
4	Technologic Infrastructure	Clear Evidence	Comprehensive Evidence	Evidence
5	Information Database	Comprehensive Evidence	Clear Evidence	Clear Evidence

Table D.5: Judgements of industry: Partnership & resources.

	Criterion 5: Products, Processes & Services	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Design of Processes	Comprehensive Evidence	Comprehensive Evidence	Evidence
2	Optimizing of Processes	Evidence	Some Evidence	Limited Evidence
3	Reducing Inconveniences	Clear Evidence	Clear Evidence	Evidence
4	Regular to International Conventions	Clear Evidence	Evidence	Evidence
5	Ship Recycling Method	Evidence	Evidence	Evidence

Table D.6: Judgements of industry: Customer resources.

	Criterion 6: Customer Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Image in the Sector	Evidence	Clear Evidence	Some Evidence
2	Supporting Ship Owners & Customers	Comprehensive Evidence	Comprehensive Evidence	Clear Evidence
3	Reasons to be Chosen	Clear Evidence	Clear Evidence	Evidence
4	Reputation	Clear Evidence	Evidence	Some Evidence
5	Confidency about Occupational Accidents	Clear Evidence	Evidence	Evidence

Table D.7: Judgements of industry: People results.

	Criterion 7: People Results	RESPONSES		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Employee Rights	Comprehensive Evidence	Comprehensive Evidence	Clear Evidence
2	Internal Communication	Comprehensive Evidence	Clear Evidence	Clear Evidence
3	Training & Development	Comprehensive Evidence	Comprehensive Evidence	Clear Evidence
4	Loyalty to the Organization	Clear Evidence	Clear Evidence	Evidence
5	Working Conditions	Comprehensive Evidence	Clear Evidence	Clear Evidence

Table D.8: Judgements of industry: Society results.

	Criterion 8: Society Results	RESPONSES		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Cooperation with Government	Evidence	Evidence	Evidence
2	Cooperation with Universities	Evidence	Evidence	Some Evidence
3	Inspections	Clear Evidence	Clear Evidence	Evidence
4	Neighbour Relations	Evidence	Evidence	Some Evidence
5	Image on the Society about Environmental Impact	Evidence	Some Evidence	Some Evidence

Table D.9: Judgements of industry: Key results.

	Criterion 9: Key Results	**RESPONSES**		
	Question Areas	**Approach**	**Deployment**	**Assess&Refine**
1	Investment to the Information	Evidence	Evidence	Evidence
2	Reducing the Error Rate	Evidence	Evidence	Evidence
3	Total Producing Volume	Clear Evidence	Clear Evidence	Evidence
4	Performance Indicators	Evidence	Clear Evidence	Clear Evidence
5	Financial Control Results	Clear Evidence	Evidence	Some Evidence

APPENDIX-E

Table E.1: Transforming of judgements into numeric data for leadership criterion (academia).

	Criterion 1: Leadership	**RESPONSES**			
	Question Areas	**Approach**	**Deployment**	**Assess& Refine**	**Average Score**
1	Mission & Vision	50	25	0	25,00
2	Innovation	25	50	0	25,00
3	Motivation	50	25	25	33,33
4	Giving Value to Employees	50	50	25	41,67
5	Communication with Shareholders	75	50	50	58,33

Table E.2: Transforming of judgements into numeric data for leadership criterion (industry).

	Criterion 1: Leadership	**RESPONSES**			
	Question Areas	**Approach**	**Deployment**	**Assess& Refine**	**Average Score**
1	Mission & Vision	50	25	0	25,00
2	Innovation	75	75	50	66,67
3	Motivation	50	50	25	41,67
4	Giving Value to Employees	50	50	50	50,00
5	Communication with Shareholders	75	75	25	58,33

Table E.3: Calculations of leadership criterion.

	Average Scores of Academia	**Average Scores of Industry**	**Net Score of Leadership Areas**	**Net Score of Leadership**
Mission & Vision	25	25	**25**	
Innovation	25	66,667	**45,833**	
Motivation	33,333	41,667	**37,500**	**42,485**
Giving Value to Employees	41,667	50	**45,833**	
Communication with Shareholders	58,333	58,333	**58,333**	

CURRICULUM VITAE

Name Surname	**: Çağatay KANDEMİR**
Place and Date of Birth	**: Kayseri 10.05.1988**
Address	**: ITU Maritime Faculty, Tuzla/ISTANBUL**
E-mail:	**: ckandemir@yandex.com**
B. Sc.	**: Karadeniz Technical University**