



# Master's degree thesis

LOG950 Logistics

Competitive tendering and quality in the Møre and Romsdal maritime industry: A multi-cases study

Niklas Ostnes Johnsen

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Molde, 27.05.14



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## **Preface**

This thesis represents the final part of the Master of Science in Logistics program at Molde University College. It thus also represents the end of my five year long studies in Molde. After extensive writing this semester I would like to keep this part short.

I will however express my gratitude to all those who have been involved during the process of this thesis. I would first of all thank Professor Arild Hervik for all his assistance, guidance and help throughout this entire process. Without him this thesis would not have been possible.

I would also like to thank all the informants that have contributed in relation to this thesis. First of all, I would like to thank Per-Olav Løkseth, Marketing Director at Brunvoll, for his invaluable contributions with regards to the equipment suppliers and the processes in this link.

Second, I would like to thank CEO Gunvor Ulstein and Deputy-CEO Tore Ulstein at Ulstein Group for taking their time to meet me and Professor Hervik and the invaluable contributions during this interview. I would also like to thank Torild Bugge at Ulstein Group for arranging this meeting.

At last, I would like to thank CEO Karsten Sævik at Remøy Shipping for his contribution in relation to the third case.

Molde, May 2014

Niklas Ostnes Johnsen

## **Abstract**

Much of the existing research concerning competitive tendering has been related to tendering and the public sector. This thesis will however provide an exploratory study where in total three cases in relation to the Møre and Romsdal maritime industry are investigated. The cases represent the three buyer supplier links in the offshore marine service supply chain. In order to explore the tendering processes in relation to this industry four research questions were formulated in connection to each of the three cases. The first is related to how the process is and how it is managed. The second addresses how quality is defined, and the third focus on how these factors are weighted with price and how the quality incentive problems that might arise are dealt with. The last addresses how these factors are related to the actors' ability to tackle global competition. In order to provide answers to the stated research question a multiple case study is conducted where interviews serves as the primary data collection method that is supported by secondary sources. The limitations in connection to this study concern that it is not possible to generalize the findings. In relation to further research a more quantitative approach incorporating all the companies in the cluster should thus be conducted.

The findings show that the tendering processes in its general form in each link is in accordance with what is addressed in the literature where determining specifications, deciding the bidder's list and bidder's short list, request/invitation to tender are the common steps in the tendering process. The processes are however complex and there might several factors impacting how they are set out and managed. There might be several additional actors such as designers, contractors, broker, financial institution that impacts how these processes are managed. The complexity of the project can in addition to this also have implication. It is seen that more complex projects imply more negotiations as in accordance with the literature. Finally, can relation and previous interactions impact the processes in terms of which of the actors are selected to be on the bidder's list and bidder's short list. That the actors are pre-selected contrasts the public tenders that in most cases are open to all potential bidders.

The findings also show with regards to quality that it is a total concept in each link that depends on several dimensions. The dimensions are related to factors such as the quality of the physical product, quality of the service, HSE-measures, on-time delivery, branding and

documentation of these factors. In order to achieve the goals of the oil companies in terms of these different factors, it is also seen that it is important to manage the entire supply chain. That the quality is total concept implies that the evaluation stage is based on a total perspective and not only the price. How this is balanced is however not necessarily communicated to the different bidders which contrast the public tender practices where this in most cases is done. With regards to the quality incentive problems, the findings show that this is avoided by adapting measures such as introducing a pre-qualification stage, the seller signaling quality in terms of for instance branding, screening by requiring the seller to provide documentation, emphasizing the seller's reputation and trust between the parties in the pre-selection stage, options and the length of the contract.

Finally, the findings show that the actors in the cluster have gained a competitive advantage due to the quality that is provided in addition to the relations that the shipping companies in this region have developed in connection to many of the oil companies. The quality is to a great extent related to the cluster effect and cultural factors when developing new solutions. This is supported by branding and aftermarket services. Many of the actors in the cluster like Brunvoll, Ulstein etc have managed to develop a strong brand through continuous interactions with their customer over time, something which takes time for the competitors to imitate.

***Keywords: Competitive tendering, quality, Møre and Romsdal, maritime industry***

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# 1.0 INTRODUCTION

## 1.1 Background

Competitive tendering is today a highly regarded method when acquiring goods and services and is especially common in the public sector where it is applied in order to secure value for the tax payers' money (Spurgeon & Hicks 2003). The EU directives, European procurement directive 2004/17 and 2004/18, prohibits tendering as mean of acquiring goods and services within certain threshold values in order to attempt to create an open and competitive ground for the member state's companies (ec.europa.eu 2014). Because of this, a lot of the existing research on competitive tendering has been focused on the public sector. The existing research on competitive tendering focuses to a large extent on the efficiency of the competitive tendering in the public sector and its ability to secure value for the tax payer's money. An additional concern that is addressed in the literature is competitive tendering and its ability in terms of securing services that yields a satisfactory quality, which is especially important in the health care sector (Mougeot & Naegelen 2003; Chalkey & Malcomson 1996; Mc Combs & Christianson 1987; Spurgeon & Hicks 2003).

The private sector and competitive tendering has however not been addressed to the same extent as the public sector in the existing literature. The extant literature related to tendering and the private sector concerns the similarities and differences between public procurement and private purchasing (Arlbjørn & Freytag 2012). This research explains that the public procurement follows more strict rules and regulations compared to the private sector where the importance of negotiations as an additional mean of acquiring goods and services is highlighted. In addition is the element of trust in private purchasing an additional factor that is addressed in this literature.

The maritime industry, which is one of the most important Norwegian industries, and competitive tendering has however barely been addressed in the extant literature. The maritime industry deals with complex products where quality which concerns hard quantifiable measures as will be discussed, comes in to play as an important factor in addition to the price when the different parties in this industry acquire goods and services.

Since quality is such a hard measure to quantify for the parties involved, and since quality represents a wide range of other factors than price, then this implies some level of negotiations taking place between the involved parties (buyer and sellers). The companies in this industry is however still interested in procuring goods and services at lowest possible price in order to maximize their profitability and thereby secure a sufficient return on the owners investment. An additional concern for a company issuing a tender in this industry is therefore how less quantifiable measures represented by the different quality factors should be seen in connection with and weighted with quantifiable measures such as the price. Important in this relation is also how the buyer's priorities and preferences in terms of price and quality is communicated to the different bidders.

The reason for this is that it represents an advantage for the different bidders to possess as much knowledge as possible with regards to the buyer's priorities in order to win the tender. Improving the quality might on the one side make the bidder more attractive in terms of this, but improving quality will in some cases also result in additional costs that eventually increases the price. Stripping the quality down to a minimum level might in the opposite case lead to lower costs that makes it possible for the bidder to underbid the other contenders. In order for the bidders to come up with optimal balance in terms of price and quality it is therefore necessary to know the priorities of the company issuing the tender.

In addition to this, is it important in relation to quality how the parties can avoid that quality is deterred ex-post by the company that has been awarded the contract. For the company that has been awarded the contract it might be tempting to deter quality in order to gain short term profit. Even though this can be observed ex-post by the parties, it will hard be to verify, which implies that it is hard prove that the quality that has been provided is not at a satisfactory level. This is especially true when dealing with services. In order to avoid this problem it is important that the auctioneer designs a contract that provides incentives to the supplier that has been awarded the contract. In addition is it important to screen the companies and select companies that are credible in terms of this in the prequalification process. Much of the existing literature concerning this issue has as mentioned been focused on the public sector especially in connection with the health care sector and it will be this interesting to see how this problem is dealt with in the maritime sector.

This thesis will therefore serve to fill up this research gap in the way that it will provide an exploratory framework of competitive tendering and quality in the maritime industry. It will focus on competitive tendering and the quality element in each of the different buyer-supplier links in the maritime supply chain exemplified by three different cases from the Møre and Romsdal maritime industry. The Møre and Romsdal maritime industry is claimed to be in a unique position due to its alleged ability to innovate and create high quality solutions that are valued by its customers (tu.no). Because of this, other factors than price are perceived to be important when the different parties in this region acquire goods and services from other companies in the maritime supply chain. In other words, can the associated quality factors in the tender possibly help explain the alleged uniqueness that this cluster experiences. This thesis will therefore in addition attempt to connect these quality factors represented in the maritime tenders with the clusters alleged uniqueness and its ability to cope with foreign competition. Doing so can help clarify this and provide a basis for further research in this area.

## ***1.2 Aim and purpose***

The purpose of this study is to explore the tendering processes in relation to the Møre and Romsdal maritime supply chain and acquire an understanding of quality and the importance of this in relation to these processes. When having acquired an understanding of how these processes are executed and the different choice that are made throughout the processes and quality in relation to these, it will provide us with important knowledge that can help highlight the competitive environment and explain the cluster's alleged uniqueness. This thesis can therefore help to increase the awareness of the decision makers involved in these processes. Increasing their awareness can be with regards to the process and the associated factors involved and how the company contributes to the cluster's uniqueness.

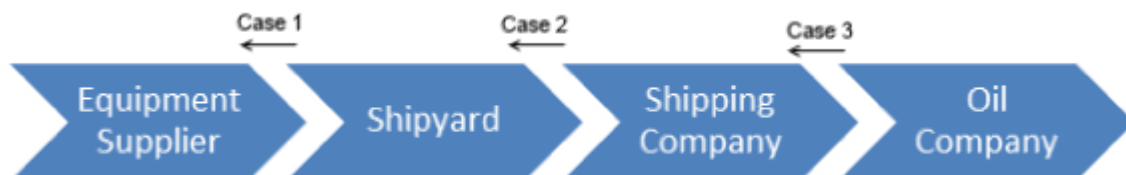
When exploring competitive tendering in relation to a private sector like the maritime sector, important knowledge will also be gained with regards to tendering and the private sector. The thesis can at last also serve as a basis for a qualitative study within this area. A qualitative study will provide us with the opportunity to generalize our findings to other companies within the cluster. This will be necessary in order to confirm the findings in this thesis where three cases are investigated in detail. A qualitative study will be necessary in

order to confirm the findings in this thesis and to make sure that this also applies to the other companies present in the cluster.

### **1.3 Research questions**

To fill up the abovementioned research gap we want explore the tendering process in each of the different links in the maritime supply chain in addition to exploring the importance of the different quality factors in these processes and their significance in terms of the Møre and Romsdal maritime cluster and its ability to meet competition from abroad. The perspective of this study will as mentioned be each of the different buyer-supplier links that are represented in the supply chain. Three different cases will therefore be presented in this thesis representing different links in the offshore marine service supply chain.

The first link represents the shipyards and their acquisition of goods and services from the equipment and service suppliers. The tendering process and quality in this link will be further explored in this thesis by collecting data from Brunvoll AS which represents one of the largest equipment suppliers in this cluster. The next link represents the shipping companies' acquisition of new vessels from the shipyards. The tendering process and quality in this link will be explored by collecting data from Ulstein Group which represent one of the largest shipyards and design service suppliers in the cluster. The final link represents the oil companies' acquisition of offshore marine services from the shipping companies. This link will in this thesis be explored by collecting data from Remøy Shipping representing one of the shipping companies being present in this region. From what has been stated earlier it is therefore possible to derive the following research questions relevant for each of the different links that are present in the offshore marine service supply chain.



**Figure 1 - The offshore marine service supply chain and thesis perspective**



1. What is the competitive tendering process and how is the process managed?
2. How is quality defined in the tendering process?
3. How is the trade-off between achieving a low price and satisfying the quality standards balanced, and how are the quality incentive problems dealt with?
4. How do the associated quality factors in the tender relate to the actors' ability to meet global competition?

The research questions are all interconnected and are dependent on each other. The first question focuses on the tendering process itself. In this are the different steps that are taken and how the process is designed. This research question will first of all help give clarity with regards to the process and how the process is set out. The second question more specifically focuses on the different quality factors that are a part of the tendering process and thereby what is important for the different parties to focus on in addition to price in order to win the tender.

The third question is a further extensions of this in which the trade-off between the price and quality is highlighted. This question highlights how the hard quantifiable measures are weighted together with the price representing a quantifiable measure. Important in this relation will be how the company issuing the tender prioritizes between these two measures, and how this is communicated to the different parties placing their bid. In addition to this are the quality incentive problems highlighted in which the supplier might be tempted to deter quality ex-post, and how the maritime companies can avoid this by providing incentives. In this question a part of the competitive environment is also indirectly highlighted in that foreign actors might offer solution at a lower price while the actors that are a part of the cluster might offer high quality solution but at a considerably higher price.

The last one is also connected to the others in that the quality factors that are addressed in the previous questions are related to the competitive environment of the cluster and its ability to meet competition from abroad. It lies in this that companies in the maritime cluster might satisfy the abovementioned quality factors in a better way than the foreign

competitors and therefore are the preferred choice when issuing the tender/when selecting the winner. When one of the actors in the maritime cluster buy from the other actors that are a part of the maritime cluster, then this helps to promote the cluster and help secure long term sustainability for the industry in this region.

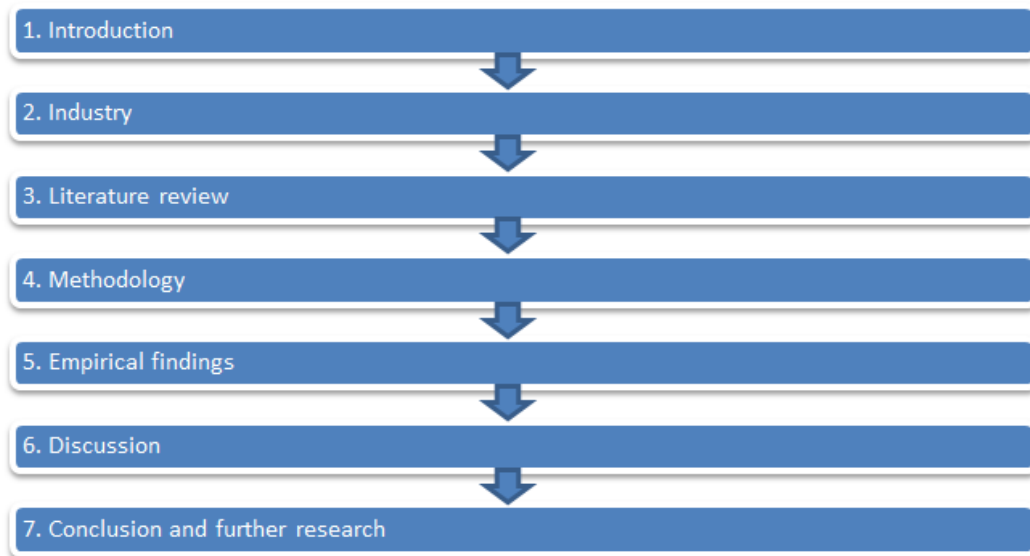
#### ***1.4 Structure of the paper***

The purpose of this study and the research questions has already been presented in this introduction chapter. In the continuation, we will in the next chapter present some background information with regards to the industry. The shipbuilding value chain and the marine operations in relation to the petroleum value chain will be presented. In addition to this will other important actors and interest groups be presented. After providing an overview of this, an overlook of the Norwegian maritime industry will be presented where the Møre and Romsdal cluster is considered in a separate sub-chapter. In this chapter the structure and developments in relation to the different vessel segments in this region will also be presented.

In the third chapter the most important literature will be presented. This part first presents theory in connection to purchasing and supply chain management that is followed by a chapter related to auctions and the most important theory in connection to this. This chapter is followed by a sub-chapter where quality is considered and how the literature perceives this concept. After this some public tendering practices are presented in order to complement and contrast our case. Finally, in this chapter the theory concerning monopolistic competition and competitive advantage is presented in order to help explain how these factors related to the actors' ability to tackle global competition. A summary is also provided where what has been addressed in the literature is connected to the research questions.

The fourth chapter provides an overview over the methodology. The sub-chapter in this relation concerns the research design, data collection and how validity and reliability is ensured. The fifth chapter provides an overview over the empirical findings in each of the three different cases. In the sixth chapter these findings are discussed in relation the research questions where each questions constitute a respective chapter. In the final chapter a conclusion is provided in addition to that the direction for further research is

pointed out. The different chapter in the continuation of the thesis is found in the figure below.



**Figure 2 - Figure illustrating the different chapters and the structure of the paper in the continuation of the thesis**

## **2.0 INDUSTRY**

### ***2.1 The maritime industry***

The maritime industry can be defined as all companies and enterprises that own, operate, build, design and deliver equipment or specialized services to vessels and other floating units (Jacobsen 2011). This is a broad definition including companies also operating within other business areas thus implying only a partly involvement in the maritime industry. The focus in this thesis will however be the maritime companies that are involved in the supply of offshore services to the petroleum sector. This is due to the fact that most of the maritime companies in the Møre and Romsdal region are somehow as we will see, either directly or indirectly, involved in the supply of these services to the petroleum sector. In this part we will after providing a general overview of the current newbuilding market present the shipbuilding value chain and the petroleum value chain in addition to other actors and interest groups.

### 2.1.1 General overview

From the figure it can be seen that most of the new builds today are built at Chinese shipyards. This is especially true in terms of the more standardized platform supply vessels where the majority are built at Chinese shipyards followed by American and Brazilian shipyards. In total over 60 % of all the platform supply vessels under construction, are built at Chinese shipyards (Farstad 2013). In terms of the Norwegian actors, there has however been a development in terms of that the actors to a greater extent have been focused on developing subsea vessels. These vessels are more complex vessels, as will see later on when presenting the petroleum value chain, which demands a greater level in terms of quality. In terms of quality, these vessels belong to the upper segment due to the fact they are vessels that require a wide range of different equipment and functionality in order to succeed with supporting the subsea operations. In total were 35 % of all the subsea vessels under construction at the beginning of 2014 built at a Norwegian shipyard (Farstad 2013). This shows that the Norwegian actors are in a leading position when it comes to the development of more advanced vessels.

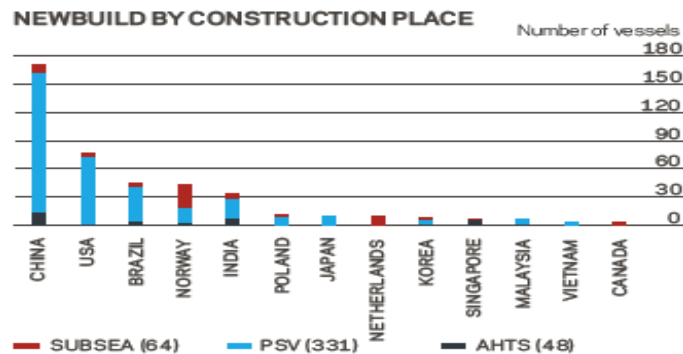


Figure 3 - An overview of the new build activity based on place of construction (Farstad.com 2013)

### 2.1.2 The shipbuilding value chain

As mentioned are most of the maritime companies situated in the Møre and Romsdal area somehow involved in the supply of marine offshore services to the petroleum sector. The companies might be directly involved in the supply of these services or indirectly by providing vessels, equipment or services to the companies that provides these offshore services to the oil companies and contractors. The maritime sector might be divided in to two parts where we on the one side have the service suppliers and where we on the other

side have the ship industry providing equipment and vessels to the service providers (Benito et al. 2003). In the continuation, we will first have a closer look at the shipbuilding value chain and the different parties that are involved here. After giving a closer description of this value chain and the main parties associated with this, the different marine services will in the next sub-chapter be described and seen in connection with the value chain of the petroleum sector.

The design offices are involved with a vessels conceptual design and they therefore cooperate closely with the shipyards in order to design vessels that match the shipping companies' and/or the shipyard's criteria (ECORYS 2012). Many of the design offices are because of this also an integrated part of the shipyard. An example of this is Ulstein Group where the design office amongst others is an integrated part of the consolidation together with the shipyard (Ulstein.no 2014a). The design offices also cooperate closely with other parties like the classification societies, marine equipment suppliers and other actors in the value chain in order to secure innovative design and solutions (ECORYS 2012).

The marine equipment suppliers provide equipment and components that are used by the shipyards when constructing the offshore vessels. The components and equipment that is supplied by this party can have a major impact on the vessels performance and/or operational costs, and because of this is cooperation between the suppliers and shipyards important in order to secure supreme vessels in terms of performance and operational costs (ECORYS 2012). The recent years many shipyards have relied heavily on outsourcing and the importance of the marine equipment suppliers has therefore increased the last couple of years. Because of this development, the new situation now is that the suppliers develop equipment packages and supply these to the shipyards that handle the final assembly of the vessel (Oterhals 2011).

The shipyards assemble the different equipment and components in to the final offshore vessels that are eventually sold to the shipping companies. Due to the recent development, in that the shipyards outsource many of the activities, they might now be perceived as system integrators that combines different solutions and innovations from the parties downstream into an assembled vessel (ECORYS 2012). Their position as a system integrator therefore involves close cooperation with the design offices and the marine

equipment suppliers when attempting to develop new innovative solutions and design (ECORYS 2012).

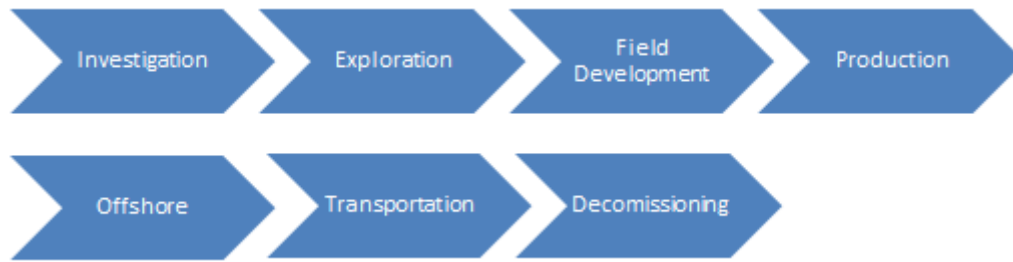
The offshore shipping companies as mentioned acquire their vessels from the shipyard and have several vessels in their fleet that are able to provide different services for the oil companies and contractors based on their specific needs and the context. The shipping companies and their vessels are involved in several of the stages in the petroleum value chain as will be discussed later. The offshore shipping companies are in other words companies that own and operate a wide range of offshore vessels that provides services that are essential for the oil companies in order to be able to extract oil offshore (Norges Rederiforbund 2012).



Figure 4 - The shipbuilding value chain (ECORYS 2012; Oterhals 2011)

### 2.1.3 The petroleum value chain and marine offshore services

In order to describe the wide range of marine offshore services and vessels that the offshore shipping companies provide to the oil companies and other parties operating offshore, it is useful to see them in connection with the different steps in the petroleum value chain. To have a basic overview of the offshore marine services and the type of vessels that are provided to the petroleum sector is a useful context. The tendering process might be altered in a different way depending on the type of vessel that is provided. We might also experience that quality, which we will define later, are of greater importance in some segments than in other. This can be understood in that for instance subsea operations are more complex operations than compared to basic supply operations. Because of this situation, the vessels providing subsea services might demand a higher level of quality than the vessels providing more basic supply services.



**Figure 5 - The petroleum value chain (Norges Rederiforbund 2012)**

The offshore shipping companies are as mentioned earlier engaged in activities throughout the entire value chain of the petroleum sector. The first step in the value chain where the offshore shipping companies are involved is the investigation part (Norges Rederiforbund 2012). This part is conducted before the oil exploration can begin and it includes a thorough mapping of the sea floor in order to get information with regards to possible drilling spots (Norges Rederiforbund 2012). In order to be able to map the sea floor thoroughly it is necessary to use seismic vessels that possess these properties. The field development stage also requires the offshore shipping companies services. During this stage construction support vessels are required in order to support the operation (Norges Rederiforbund 2012).

The shipping companies are also engaged in order to support the day-to-day operations that are necessary in order to ensure production. In this phase, supply vessels are acquired in order to ensure this. During the production phase shipping companies and their vessels are engaged in order to ensure floating production, storing capabilities and opportunities in terms of offloading. When the life of an oil field has ended, offshore vessels are also required in order to assist in the platform removal (Norges Rederiforbund 2012).

We might classify the different offshore shipping companies into three sub-categories based on the service they provide and the type of vessel they operate: offshore service companies, seismic survey companies and subsea contractors (Norges Rederiforbund 2012). The fleet of first sub-group consists mainly of anchor handling vessels (AHT and AHTS) and platform supply vessels (PSV). The anchor handling vessels' tasks consists of towing the platform to new locations and reanchoring (Norges Rederiforbund 2012). Many of these vessels are also capable of supplying the oil rigs. The difference between the anchor handling vessels and the platform supply vessels is that the anchor handling

vessels have winches and sterns that allow for towing and anchor operations (Norges Rederiforbund 2012). The machinery is in addition to this designed specifically in order to handle such operations. The platform supply vessels are on the other hand specifically designed for the purpose of supplying the oil platforms. The tasks of these vessels consist of transporting personnel and cargo to and from the oil platform. The cargo that these vessels transport includes mostly chemicals, fuels and other materials that are used in the drilling process (Norges Rederiforbund 2012).



**Figure 6 - Bourbon Mistral: One of the PSVs in the Bourbon fleet (Bourbon-offshore.no 2014a)**



**Figure 7 - Bourbon Surf: An AHTS vessel in the Bourbon fleet (Bourbon-offshore.no 2014b)**

The next sub-group presented above is the subsea contractors. This group has a fleet of subsea vessels that are engaged in underwater operations (Norges Rederiforbund 2012). The services of these vessels are needed in order to install and repair subsea production installations. The subsea vessels are more complex and costly than compared to many of the other vessel types. The reason for this is these vessels require special equipment in order to be able to support subsea operations (Norges Rederiforbund 2012). This group's fleet might consist of the following specialized vessels supporting different phases of the subsea operations: MPSV, ROV Support Vessels, Pipe Laying Support Vessels, Construction Support Vessels and Diving Support Vessels (Norges Rederiforbund 2012). The third sub-group consists as mentioned of the shipping companies engaged in seismic activities. The companies engaged in such activities mostly only own seismic vessels. These types of vessels are used in order to map the sea floor to attempt to spot potential drilling spots (Norges Rederiforbund 2012).





Figure 9 - Oceanic Sirius: A Seismic research vessel built by Ulstein Group for Oceanic Seismic (Ulstein.no 2014b)



Figure 8 - Seven Viking: An inspection, maintenance and Repair vessel (IMR) used for subsea operations built by Ulstein for Eidesvik Seven AS (Ulstein.no 2014c)

### 2.1.4 Other actors and interest groups

In addition to the actors directly involved in the value chain there are also other influential actors and interest groups that play an important role in and influence the other parties in the chain. The reason that it is important to give a basic overview over the most important actors is that some of these actors and their position help decide important parameters in the tender. If one of the shipyards for instance is able to gain better financial terms from their bank than compared to what its competitor is able to, then this might help decide the outcome of the tender. The most important actors associated with the maritime sector are depicted in the figure below.

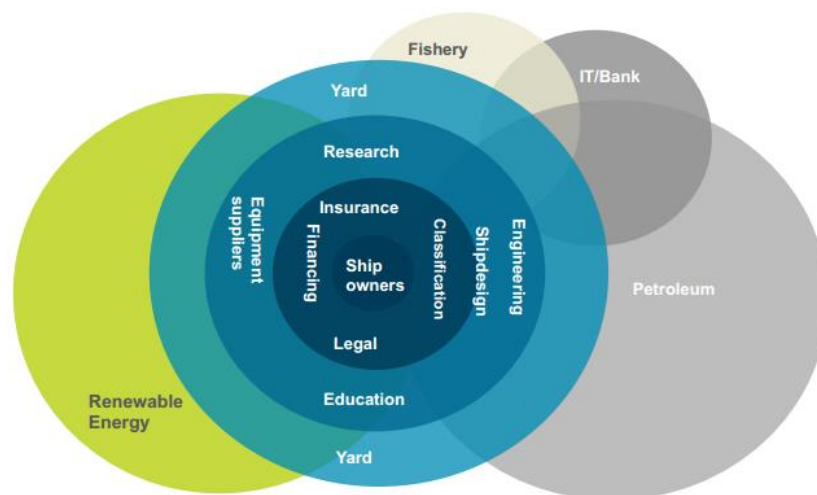


Figure 10 - Actors and interest groups associated with the maritime offshore industry (Ulstein 2013).

## **Classification societies**

One of these other actors is the classification societies. The classification societies are responsible for developing standards and inspecting that the different actors comply with these standards (ECORYS 2012). This might for instance be technical standards in relation to the design and construction of the vessels. In order to make sure that the different parties comply with these standards, the classification societies conduct surveys and inspections of the vessels and their systems (ECORYS 2012). The main focus of the classification societies when conducting surveys and inspections of the vessels is safety.

Many of the classification societies are however climbing upwards in the value chain from traditionally focusing mostly on finished vessels and their compliance with the developed standards (ECORYS 2012). Many of the classification societies now interact with other parties situated further up in the value chain like the equipment suppliers and design offices. The interaction with these parties in the value chain involves innovations which are able to improve the vessels efficiency in terms of fuel and reducing the operating costs (ECORYS 2012). This interaction has amongst others contributed to a wide range of innovations in terms of vessels and greening. Some of the largest classification societies are: Germanischer Lloyd, Det Norske Veritas, Lloyd's register and the American Bureau of Shipping.

## **Financial institutions**

Another important party to be mentioned in relation to the actors in the value chain is the companies providing access to capital such as banks and other financial institutions. Access to capital can be an influential factor in this market in that it helps determine the demand for vessels in the market (ECORYS 2012). There are in general several ways in which the parties can get access to funding. What these different ways have in common however is that the either have to deal with equity or debt.

In order to get access to capital the party raising funds might first of all address the owners and ask if the funds can be provided. An additional way of acquiring funds is to address banks and submit a loan request (ECORYS 2012). In terms of providing credit the authorities also play a crucial role through different credit arrangements, which we will

come back to later. In addition it is also possible for the parties to acquire the funds exploiting the capital markets through for instance issuing bonds (ECORYS 2012). It is also possible for the parties to develop a so-called “stand alone structure” in order to finance the vessels for instance through creating companies that acquires the vessels on behalf of for instance the shipyard and thereby transferring the financial risk to this specific investment company (ECORYS 2012). This structure might also be developed in cooperation with other parties forming a joint partnership where the financial risk is split.

In relation to funding and the shipping companies’ acquisition of vessels, is a central question the pre-delivery financing of the vessels. In order for the shipyards to be able to acquire the necessary parts from the suppliers, it is advantageous from their side to have an as large part as possible of the payment before the actual delivery of the vessel. The shipping companies however prefer to pay an as small amount as possible until final delivery of the vessel. This situation can be dealt with in that the shipping companies pay a certain amount when the project reaches certain milestones like for instance contract signing, steel cutting etc (ECORYS 2012). Another way of solving this that the buyer pays a certain percentage up front and then the rest of the money are paid at the time of delivery. In relation to this are refunding guarantees a central issue in that the buyer has guarantees that the bank will repay the amounts that have been provided in a bankruptcy situation (ECORYS 2012). Both the payment distribution between the parties and the refunding guarantee are therefore negotiable factors that can be decisive in a tender situation in this link.

### **Authorities**

Another major actor that is involved in this industry is the authorities. The authorities are directly and indirectly involved in several ways. As mentioned are the authorities involved on the financing side in terms of in terms of providing guarantees and subsidies to the industry. Many governments have established government credit agencies that provide credit to the customers of the national export companies (ECORYS 2012). The Norwegian government agency, Eksportkreditt Norge, provides such credit to amongst others the Norwegian maritime companies that exports vessels to abroad actors (Eksportkreditt.no 2014). The authorities might also in addition to this aid the maritime companies by supporting research and development (R&D) projects. The Norwegian

research council (Forskningsrådet) and the Norwegian government has amongst others initialized a program called MORAFF where the goal is to support innovative projects with the areas environment, advanced maritime operations and advanced logistics and transportation (Forskningsrådet.no 2011). The governments also play a crucial role in terms of legislation and adopting new policies that might range from tax levels in the petroleum sector to policies that affect the wage levels of the shipping companies' crews. Finally, the authorities have also a responsibility in terms of the education system in order to make sure that enough qualified personnel are educated to the maritime sector.

## **Brokers**

One last important actor to be mentioned in connection with the different actors in the maritime industry is the brokers. The brokers are independent parties that attempt to match the buyers, which in this industry might for instance be the shipping companies, with potential sellers that in this industry might be the shipyards or design offices. The brokers possess detailed knowledge concerning the different market actors, the yards and their capacities and the prevailing trends in the market (Fearnleyoffshore.no 2014). The brokers might either be involved in the newbuilding process through assisting the client through all the different stages in contracting a new vessel or by handling transactions that regards offshore units (Fearnleyoffshore.no 2014). The brokers in other words have an in-between role where they can exert influence in the negotiations between the parties. From this it is therefore seen that the brokers might be an influential actors that helps decide the outcome of the tender if being involved in the transaction. A clarification of their role and influence in the tendering process is therefore necessary in the continuation of this thesis when investigating the tendering process and how it is managed. An example of brokers involved in the offshore maritime industry is amongst others Fearnley and RS Platou.

## ***2.2 The Norwegian maritime industry***

In this part an overview of the Norwegian maritime industry will be provided. A general overview of the industry will at first be provided where the different regions and their characteristics will be described. After this the Møre and Romsdal maritime cluster and its characteristics will be presented. The different segment structures and its development will finally be presented in relation to the cluster and the remaining Norwegian regions.

### 2.2.1 General overview

The maritime industry in Norway might be separated into the eight following regions: Møre and Romsdal, the Bergen region, Oslofjord, the Stavanger region, Southern Norway, Haugaland/Sunnhordland, Trøndelag and Northern Norway (Maritimt forum 2012). In terms of value creation, the Stavanger region dominates. In this region, companies that are engaged in rig and other technological services to the oil and gas industry seem to dominate as can be seen from the figure below. The second largest region in terms of value creation is the Oslofjord region. In this region the deep sea shipping companies are situated. Many of the shipping companies engaged in seismic activities are also situated in this area such as PGS and WesternGeco. In addition to this, can most of the financial and law firms be found in this region (Maritimt forum 2012). In this region the two largest banks DNB and Nordea are situated in addition to one of the largest classification companies, Det Norske Veritas. Two important companies engaged in shipbroking activities, Platou and Fearnley, are also situated in this region (Maritimt forum 2012).

The Bergen region, which constitutes the third largest region in terms of value creation, is dominated by shipping companies that are engaged in either deep sea shipping, drilling and other production services or marine offshore services (Maritimt forum 2012). Major shipping companies in this region is amongst others DOF and Dolphin Geo. DOF represents one of the largest offshore shipping companies while Dolphin Geo is engaged in seismic activities (Maritim forum 2012).

The fourth largest region in terms of value creation is the Møre and Romsdal maritime cluster. In this region the offshore shipping companies dominate in addition to shipyards and equipment suppliers (Maritimt forum 2012). In the southern region the equipment suppliers seem to dominate. The rest of regions seem to be less specialized regions compared to the other regions, especially is this the case for the northern regions (Maritimt forum 2012). The Trøndelag region represents one of the smallest maritime regions, but this however represents an important one in terms of research. The two institutes NTNU and MARINTEK, which both are situated in this region, are the most important ones in this relation (Maritimt forum 2012).

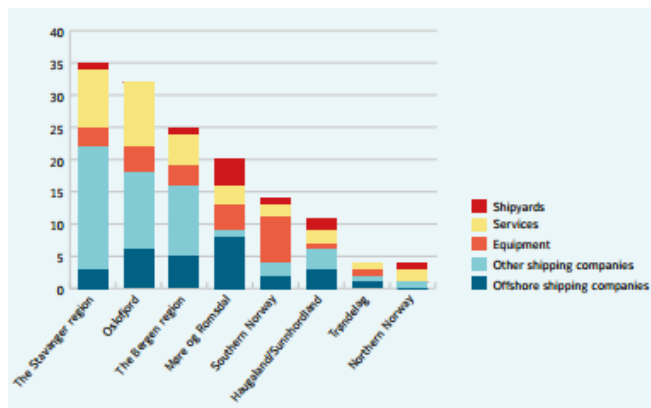


Figure 12 - The value creation in the respective regions across five different subgroups (Norges Rederiforbund 2012).

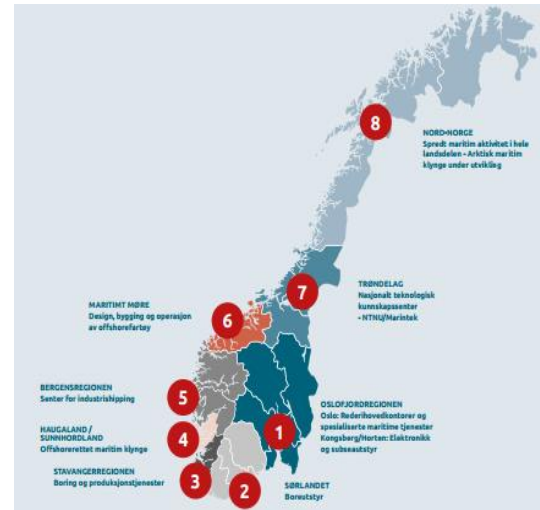


Figure 11 - The maritime industry in eight different regions (Maritim forum 2012).

## 2.2.2 The Møre and Romsdal maritime cluster

The maritime cluster located in Møre and Romsdal is today considered to be one of the world's leading maritime offshore clusters. The cluster is known for its ability to innovate that is supported by the interplay between the different parties in the cluster. The cluster is one of the most complete regions in terms of the maritime companies it exists of. The equipment suppliers, designers, shipyards and offshore shipping companies are all present in this region and they all contribute in almost equal manner to the value creation in this region. As is illustrated in the figure below, do the shipping companies constitute around 40 % of the total value creation in the region. The equipment suppliers however constitute around 20 % of the value creation as the case also is with the shipyards. The design offices constitute around 10 % of the total value creation in this region.

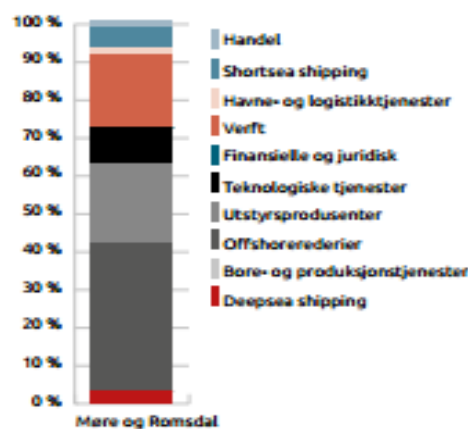


Figure 13 - The Møre and Romsdal maritime cluster's value creation across different subgroups (Maritim forum 2012)

The cluster today in total consists of 172 equipment suppliers, 14 design offices, 14 shipyards and 18 shipping companies (Hervik, 2013). Amongst the most significant equipment suppliers in this region, is it possible to find companies like Rolls-Royce Marine, Brunvoll AS and Glamox International (Bremnes et al. 2011). When it comes to the design offices in this region are some of the most significant ones Hayvard Design, Ulstein Design, Rolls-Royce Marine and Marinteknisk (Bremnes et al. 2011). In terms of the shipyards we have that Ulstein, Vard and Kleven Maritime represent the some of the most important companies in this region (Bremnes et al. 2011). As mentioned earlier is the majority of the offshore shipping companies located in this area and some of these that are located here is amongst others Farstad Shipping, Bourbon Offshore, Island Offshore, Olympic, Havila Shipping and Rem Offshore (Norges Rederiforbund 2012).

### **2.2.3 Segment structures and development**

When considering quality in relation to tendering, it is important to have an overview of the development within the different segments and the contracting of new vessels associated to these. The reason for this is as mentioned that there exist a difference between the different segments with regards to quality and the importance of this. As mentioned require for instance subsea operations more complex vessels with different equipment compared to the more basic supply operations that is provided by the platform supply vessels. The type of vessel that is contracted does in other words have direct implications in terms of the tendering process and the quality factors associated to this. A basic overview of the different segments and the development within these is thus required. This overview will be presented in relation to the development in the cluster that is contrasted with the development within the rest of sectors in Norway.

What is seen from the development across the different segments is that the vessels that are being contracted by shipyards in the cluster are mostly associated to the more complex subsea vessels. Both in year 2012 and 2013 have the subsea vessels represented the largest share based on contract value of the vessels that have been contracted in this region. The pattern is however not the same in terms of the other Norwegian shipyards where the picture is more mixed as seen from the figure below. That one of the segment represent a large share in terms of contract value might be related to that the contract value of each

different vessel is large or to that the number of vessels that are being contracted within that specific area is significant.

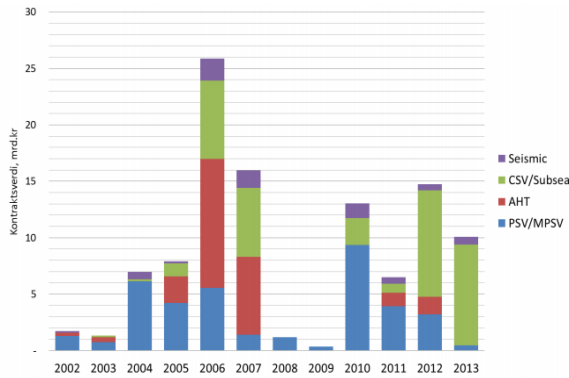


Figure 15 - Offshore vessels contracted based on contract value at shipyards in the cluster across different segments (Hervik 2013).

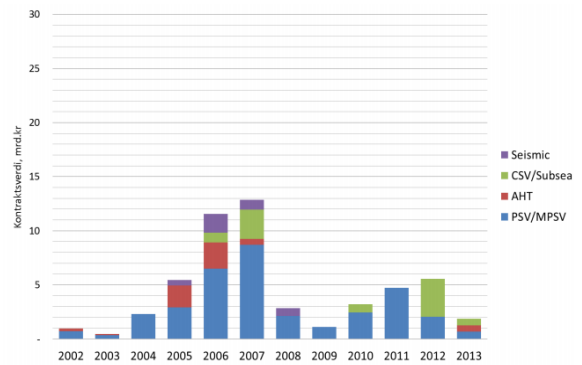


Figure 14 - Offshore vessels contracted based on contract value at Norwegian shipyards outside the cluster across different segments (Hervik 2013).

The figure below however confirms that the average contract value in terms of the more complex subsea vessels has developed and that they seem to be considerable higher than the more basic vessels types like PSVs. What can be concluded based on this information is that it seems that there is a development within the cluster in terms of building more complex vessels situated in the high quality segment. The actors seem to benefit in terms of the increased willingness to pay in relation to quality. In the last figure below is it also shown that these vessels in the high quality segment that are contracted by shipyards within the cluster are contracted on behalf of Norwegian shipping companies where the majority in 2013 was situated outside the cluster.

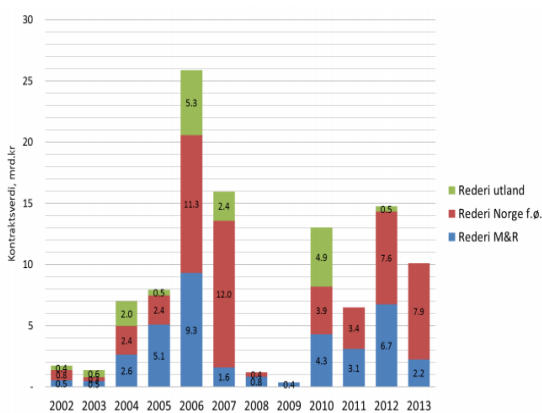


Figure 17 - Offshore vessels contracted based on contract value at shipyards in the cluster across different shipping company categories (Hervik 2013).

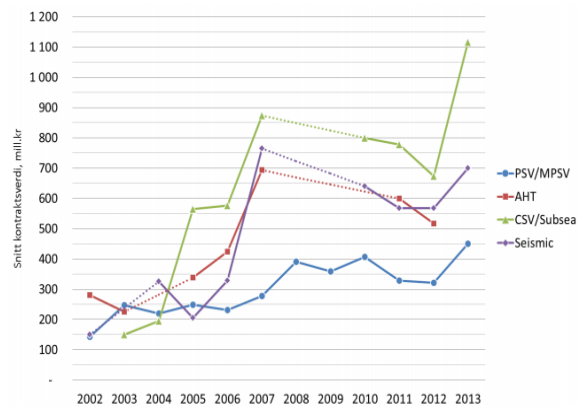


Figure 16 - The average price based on average contract value across the different segments (Hervik 2013).



The pattern in terms of increased willingness to pay in relation to vessel in the high quality confirms the forecasted pattern that was suggested by Hervik et al. (2010) in which the shipping companies orient towards more advanced operations in global markets. This was intensified after the Deepwater Horizon accident in the Gulf of Mexico where the Norwegian shipping companies were heavily involved. The accident led to an increased focus in terms of safety and other HSE-measure, which are important parameters in terms of quality (Hervik et al. 2010). Possible future operations in the arctic will in the future help intensify this pattern in which arctic operations demand a greater level in terms of quality. That the majority of the actors focus on the high quality segment however also creates niche markets that are possible for some of the actors in the cluster to exploit.

## **3.0 LITERATURE REVIEW**

### ***3.1 Introduction***

In this part the relevant literature in relation to this thesis will be provided. It will provide the academic context for the thesis in terms of providing the relevant framework, theories and concepts. In the first part of this literature review we will first of all present the theory associated to purchasing and supply chain management. It is important to have an understanding of this as it is necessary to frame tendering and what this refers to within the language of this literature. This can help explain the process, the different choices that are made throughout the process and the different factors impacting the decision whether one should tender or not. In the next part the literature will be consulted in order to understand auction and the most important theory associated to this. The reason that this is important is that auction theory can help explain some of the choices that are made with regards to the tendering process and the reason for this. This stems from that competitive tendering in fact is a procurement auction where one buyer (auctioneer) is interested in receiving bids from several sellers. It is also important in order to provide a clarification of the different terms that are used in the literature. In the literature the terms auction, procurement auction, tendering, competitive bidding etc are used interchangeably and it is thus necessary to provide a clarification of this.

The third part will consult the literature in order to attempt to define quality and how this is perceived in the literature. Quality can as mentioned earlier in relation to the maritime

industry, be a wide range of factors and it is because of this important to refer the literature in order to be able later to frame the empirical findings within this context that is provided by the literature. The fourth part will provide us with an overview of the tendering practice in the public sector. In this the public framework prohibiting tendering will be presented in addition to practices from the bus sector and maritime sector respectively. Important in this relation is what quality is in relation to these two sectors and how these hard quantifiable quality factors are weighted with the price in order to select a winner of the tender. It is in addition to this important to see how the process and the contract are designed. Understanding the tendering practices in the public sector can provide us with an insight with different approaches with regards to this, which eventually can help contrast and complement our case. In the last part the theory associated to monopolistic competition and how a company can achieve a competitive advantage will be presented. The theory and model that will be presented can provide us with an understanding with regards to the quality factors and how they relate to the cluster's ability to face competition from abroad.

## ***3.2 Purchasing and SCM***

### **3.2.1 Supply chain management**

Supply chain management is by Cooper et al. (1997) defined as a concept that ensures integration of business process to the ultimate end user through suppliers that ensures the provision of information, physical goods and services. This in other words imply planning and controlling all the processes from the suppliers upstream the supply chain to the ultimate end-customer that is situated downstream in the chain (Harrison & Van Hoek, 2013). The processes that should be planned and controlled involve demand management, customer service management, manufacturing flow management, product development, customer relationship management, order fulfillment and procurement (Lambert & Cooper, 2000).

Logistics however can in many ways be seen as a subcategory of supply chain management. Logistics involves the coordination of the material and information flow in supply chains in order to satisfy the needs of the end-customer and it is thus seen that logistics is only one of many important aspects within the supply chain management area. The difference according to Lambert et al. (1998) is that logistics deals with what is refer

to by the authors as “point-of-origin to point-of-consumption” (Lambert et al. 1998, p. 3). When defining supply chain management the important elements are thus process integration from upstream suppliers and downstream customers in order to serve the ultimate end-customer in a better way. A supply chain in its nature can however be rather complex and an important part in this relation is who is considered to be member of the supply chain. Mentzer et al. (2001) defines three categories in order to describe supply chain complexity.

The first category is the direct supply chain and consists of all the suppliers that are somehow involved the upstream or downstream flow of materials or information. The next category is the extended supply chain that consists of the supplier’s supplier and the customer customer’s that are involved in upstream and downstream flow of materials or information. The last category is the ultimate supply chain that includes the likes of financial and third party logistics provider in addition to different market research firms. Lambert et al. (1998) distinguish the supply chain members on the basis of their importance in terms of business process involvement that result in a particular output. The primary members are those directly involved in managerial activities while supporting members consist of only those who provide resources, knowledge etc to the primary members. The supporting members according to this way of categorizing the members consist of the financial providers and market research firms as mentioned above.

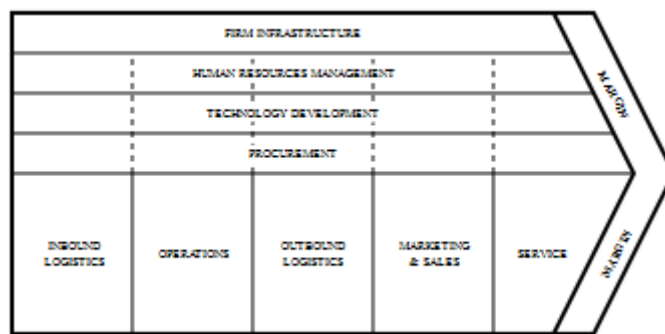
### **3.2.2 The purchasing concept and its role**

Purchasing is by Weele (2010) defined in the following way:

*“The management of the company’s external sources in such a way that the supply of all goods, services, capabilities and knowledge which are necessary for running, maintaining and managing the company’s primary and support activities is secured at the most favourable conditions.”* (Weele 2010, p. 8).

Purchasing is in other words according to this definition concerned with the company’s primary and support activities. To understand what is meant by primary and secondary activities it is necessary to refer the value chain concept as developed by Porter (1985). Porter in his value chain concept separates a company’s value chain activities into primary activities and secondary activities that all together contributes to providing a good or

service to the marketplace. The primary activities are according to Porter (1985) those activities that are directly involved when creating and transforming the product or service that is provided to the customer, and this category consists of inbound logistics, operations, outbound logistics, marketing and sales and service. The secondary activities are however those activities that support the primary value creating activities and this category consists of procurement, technology development, human resource management and firm infrastructure (Porter 1985). The different activities and the value chain can be summarized in the figure below.



**Figure 18 - The value chain and different activities.**  
 Acquired from google.com originally from Porter (1985)

From this concept procurement is as mentioned one of the secondary activities that are needed in order to support the primary activities that deal with the transformation of the physical good or service provided to the customer. Procurement exactly deals with all the activities that are necessary in order to provide the product from the supplier to the final customer. It is thus clear that procurement includes the purchasing function in addition to encompassing other important activities like transportation, storing, inspections and quality control (Weele 2010). The procurement activity should support both the primary and the remaining secondary activities. When it comes to the primary activities, the procurement function should first of all be in accordance with the necessary materials as required by inbound logistics, operations and outbound logistics respectively (Weele 2010).

The requirements as posed on the procurement function might however differ depending on how the manufacturing system is organized when a company produces a physical product. The make to stock system is based on that finished products are produced based on forecast and that the company carries an inventory of the finished product that are eventually sold to the customer (Weele 2010). The make to order structure involves that

the company carries certain raw material or modules that are eventually manufactured when the customer places his order (Weele 2010). The engineer to order structure however involves that everything is project specific and that the production will depend on the specific customer order (Weele 2010). In our case, the shipyards' manufacturing structure is in accordance to this system in that new vessels in most cases (if not producing a series of vessels) are project specific.

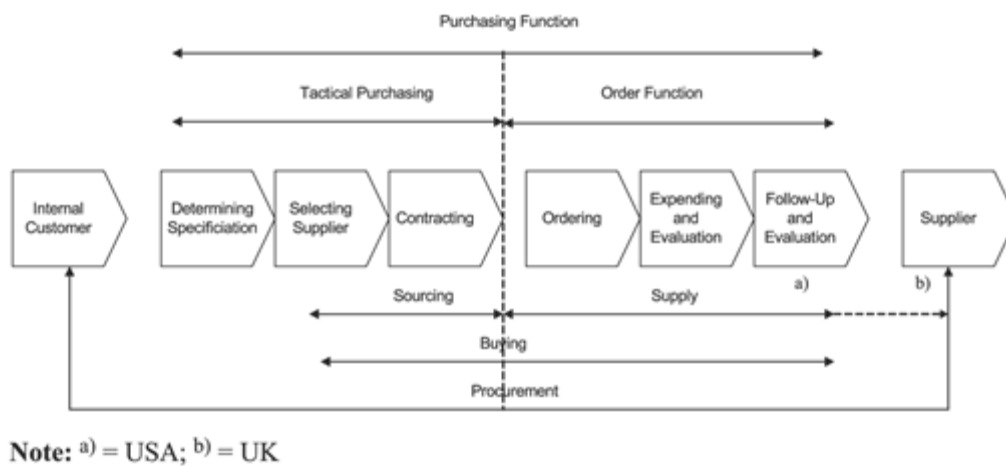
The procurement activity should however not only support the primary activities but should in addition to this as mentioned also support the secondary activities. The secondary activities are however to a large extent routine purchase and amongst others involve computers and office equipment, food, cleaning materials etc (Weele 2010). Some of these purchases might however also be project specific in terms of their uniqueness and price tag. The difference in terms of these purchases is however that they are not used directly when manufacturing the product.

### **3.2.3 The purchasing process**

The purchasing process consists of six different steps that are interlinked as depicted in the figure below. The first step involves determining the specifications. In this relation one should however separate between the functional specs and the technical specs. The functional specifications involve what the product must include in terms of amongst other functionality in order to satisfy the company's needs (Weele 2010). The technical specifications are however at a more detailed level where specific product attributes and characteristics are included accompanied by complex drawings and such. The technical specifications also include the supplier's responsibilities in terms of different activities that will be conducted by their side (Weele 2010).

The technical specifications and the functional specification together make-up the purchase order specifications that are eventually sent to the supplier. This part consists of the technical part as described by the technical specification where the design, quality and other technical issues are described (Weele 2010). In addition to this are the logistics specifications included where the time of delivery, quantity etc are included. The maintenance specifications, which also are included in the purchase order specifications, includes how the supplier will maintain the product by providing services and spare parts

(Weele 2010). In addition to the above mentioned are requirements related to environmental and legal factor included and how the product, production process and supplier should comply with these different requirements. The document does at last include the maximum acceptable price that incorporates the financial constraints on the specific project that are decided by the company (Weele 2010).



**Figure 19 - The purchasing process and the different stages. Acquired from emeraldinsight.com (2014) originally from Weele (2010).**

The next step as showed in the figure above is the supplier selection stage. This stage includes selecting a supplier that manages to satisfy what is described by the specifications in the previous steps. The previous step might already have excluded some suppliers that are not able to deliver what is described by the company in the specification and it is thus seen that the two stages are closely connected with each other. This also underlines the importance of developing proper specifications. In some situation it is also necessary to involve suppliers in order to develop a specific, unique solution that is tailored to the customer’s needs and in this situation it can be advantageous to include suppliers that possess this ability. The shipyards/design office might for instance be interested in involving some important equipment suppliers when developing new solutions in order to satisfy the needs of the shipping companies in a better way.

The first important step in term of the supplier selection stage is deciding the type of contract that is to be used. The company might either rely on a fix-priced contract, cost-reimbursable contract and a unit-rate contract (Weele 2010). The fixed-priced contract involves that the company receives a fixed price and that it is specified when the work should be completed (Weele 2010). The cost-reimbursable contract involves that the

supplier receives its payment after the completion of the activity typically after the day is due or after a certain number of hours have been reached. The unit rate involves that the supplier receive payment according to what is actual being produced (Weele 2010). It is important to note that the actual contract that is chosen might have implications in term of potential incentive problems that might arise. These incentive problems are described in detail under the auctions section.

The next step during the supplier selection stage is to pre-qualify potential supplier and to put them on the so-called “bidders’ list” (Weele 2010). This list consists of the suppliers that are capable of doing the required job. The purchase order specifications in addition to additional criteria such as the company’s previous experiences with the supplier or other criteria help decide who is actually put on this list (Weele 2010). The third step consists of issuing the request for quotation and evaluating the different bids that have been received.

Prior to issuing the request for quotations is it possible for the company to have an additional step where they company issues a request for information where the suppliers are required to provide information about previous projects and references (Weele 2010). This will however depend on the company’s preference in terms of how open the process should be. These suppliers that are qualified will now in the initial stage receive a request for quotation (or request for tender in the public sector) that is an invitation to the chosen supplier to submit a bid that is according to the specifications and other requirements in the document (Weele 2010). The last step in this stage is to evaluate the different bids that are received from the qualified suppliers. In this step the company needs to balance different factors and in this relation how it should weigh the quantifiable measures like price with the more hard quantifiable measures such as the quality, environmental and legal aspects etc. in order to rank the different suppliers. It is these steps at the supplier selection stage that constitutes the tendering process (Weele 2010). This part is thus connected to the auctions part and the quality part in this literature review. It is also connected to the public tendering and practices part where this practice will be outlined in the public sector.

After the preferred supplier has been chosen by the company, the next stage is the contract and negotiation stage. In this stage the most important issues are related to the type of contract and the terms of delivery (Weele 2010). The parties as mentioned have several different contract arrangements that can be chosen if not the fixed price arrangement is

maintained. A fixed priced plus incentive fee, cost-plus contract and cost-reimbursable contracts are just some of the contract types that can be adopted by the parties (Weele 2010). In addition to this is it important to include escalation clauses that secure that compensation in an event of a rapid increase in some of the associated costs. Currency risk if relevant is also something that should be addressed during this stage.

In addition to addressing the different contractual arrangement and terms of delivery it is also important during this stage to address the terms of payment (Weele 2010). This involves how and when the payment should be received. As mentioned earlier in the maritime industry overview is there different ways in which the shipyards can receive their payment from the shipping companies. One way as mentioned is to pay a certain amount when the project reaches milestone. Another is to pay a percentage upfront and then the rest at the time of delivery. Regardless of what method is chosen this is something important that must be addressed during this stage.

In this stage the parties must also agree on penalty clauses and warranty conditions. It is important to the company that the product or service that is provided is of sufficient quality and that they are according to the requirement and the specifications that are developed prior to this stage (Weele 2010). In addition to this it is important that there are no defect products and that it is clear what country and thereby what legal system the contract is based on (Weele 2010). The supplier must guarantee that these conditions are met in addition to that the parties must agree penalty clauses that are valid if any of the terms in the contract are breached (Weele 2010).

To next stages in the purchasing process after the contract is agreed upon, are the ordering and the expediting stages. During the order phase the actual order is placed with the supplier and the supplier is thus ready to start the manufacturing process. A purchase order is generated by the company that is provided in most cases electronically to the supplier. The purchase order will then go into the supplier's MRP-system that signals the need for material if this is not in stock (Weele 2010).

The expediting part deals with if the product is scheduled to arrive according to the agreed time schedule. There are different ways to ensure that this is secured depending on how critical the product is. One way is that the buyer contacts the supplier ex-post if the goods



have not received (Weele 2010). Another is to contact the supplier prior to the delivery to get informed with regards to the time of delivery. In addition to this is it possible that the buyer checks frequently prior to the delivery in order to informed with regards to the suppliers progress (Weele 2010). The expediting part also consists of inspecting the product in order to see if it is according the specifications and other requirements (Weele 2010).

The last stage in the purchasing process is the follow up and evaluation stage. The important during this stage is to evaluate the different suppliers and update the supplier rating (Weele 2010). This is important since it will impact the possible future tender process in which the only the prequalified suppliers receive a request for quotation. If the company is not satisfied with the supplier's product and what has been provided, it is important to update the vendor rating such that this supplier will not receive a request for question the next time the company decides to tender. In addition to this, is it important during this stage to settle eventual penalty clause and warranty issues (Weele 2010).

It is however important to note that there are several factors impacting the purchasing process. The purchasing process will be different depending on if whether the purchase goods represent a new-task situation, if it is a modified rebuy or a straight rebuy. In a new-task situation a new product is typically procured from a new supplier (Weele 2010). This situation involves developing thorough specifications that demand involvement from several of the departments in the organization. When a company faces this situation it is reasonable to tender and all of the stage in the purchasing process is thus followed.

The modified rebuy situation can either involve that the company buys a new product from an existing supplier or that an existing product is acquired from a new supplier (Weele 2010). This situation implies that not all of the stages in the purchasing process are followed. When for instance the company acquires an existing product from a new supplier there is no need to develop new specification and requirements that are already determined in a previous tender. In the straight rebuy situation both the product and the supplier is determined by the company (Weele 2010). The company in a straight rebuy situation only has to place its order since the contract and terms are already negotiated. The terms are only re-negotiated periodically (Weele 2010). This situation thus implies that only the order function in the purchasing process is necessary to carry out.

In addition to this, does the decision whether on should make or buy impact the process. If company decides to make the product themselves, there will be no purchase of the product and no process is thus necessary to conduct. The factors that impact whether on should make or buy are related to the transaction costs as addressed by Williamson (1979). The different dimensions that impacts this decision as suggested by Williamson (1979) are the frequency of the exchange, if the uncertainty or complexity is great in addition to the degree of asset specificity which implies that asset has been deployed that are specific to that relationship.

### ***3.3 Auction theory and tendering***

#### **3.3.1 Definitions**

An auction is by Salazar Valle (2004) defined as a means of resource allocating. This does in other word according to this definition imply that an auction is a mechanism that ensures that a price is established where the demand is matched with the corresponding supply in the case where the seller does not have any information with regards to the buyers' valuation of the actual object being sold. McAfee & McMillian (1987) however defines auctions as both a buying and selling mechanism. From this it is seen that it is possible to both use auctions in order to offer to sell an object or service and when procuring objects or services.

This definition of auctions in other words implies that competitive tendering (sometimes just referred to as tendering) is nothing but an auction in its actual form. A tender refers to a situation where one specific buyer is interested in finding the best supplier amongst several potential suppliers that all are interested in selling the material or service to the buyer (Menezes et al. 2003). When this is the case the buyer is referred to as the auctioneer while the sellers represent the bidders competing to win the tender. The buyer's objective in this situation is gaining the best price in addition to satisfying the quality standards. The optimal bid is because of this a certain combination of price-quality that satisfies the buyer's preferences and standards.

In our case this might refer to the situation where a shipping company is interested in buying a new vessel. In this situation the shipping company represents the auctioneer while the bidders are represented by the shipyards and/or design offices that place their bid

in their hope of winning the tender in direct competition with the other actors. It might also refer to the situation where the shipyards are buying equipment for their vessels or when the oil companies are buying offshore marine service from the shipping companies. What all these situations however have in common is that there is one buyer (the auctioneer) that is interested in receiving bids from several suppliers thus creating a competitive environment. In this process the potential buyers are matched with potential sellers in a competitive environment. From the literature it is therefore rather clear that tendering in its actual form in fact is a procurement auction where one buyer is matched with several suppliers that are interested in providing the object or service. The framework, ideas and theories associated to auctions, which will be presented in the continuation, is because of this also applicable to a tender situation where one buyer is matched with several suppliers.

### **3.3.2 Auction types and models**

Klemperer (1999) proposes two different auction models that are based on the degree of asymmetric information and the presence of this. The first is the private-value where each actor has its own private valuation of the object that is private to them and that is not known by the other bidders (Klemperer 1999). In our case this is the situation when for instance the shipping companies are interested in contracting a new vessel. When this is the situation, the shipyards each have private information with regards to production costs and other relevant criteria that are only available to them and not the rest of the contenders.

The second auction model is the common-value model where the actual value corresponds for all the actors in the auction, but where the information with regards to the value of the object is distributed differently among the actors (Klemperer 1999). In our case this is the situation if one of the shipping companies is interested in selling one of their vessels. The value is then the same for the bidders but they will in this situation have different information with regards to the valuation of this vessel. When this is the case, the different bidders will adjust their bids if any of these bidders receive a signal with regards to one of the other bidder's estimates. The more general model however incorporates both types of models and this is the normal situation in real-world auctions (McAfee & McMillan 1987).

There exist in its extreme form four different types of auctions that might be classified in to different categories. The auctions types might first of all be distinguished between open and seal-bid auctions (Menezes et al. 2003). In the first category the English and the Dutch auction is located. In the case of an English auction the price starts at a low level before it is eventually raised until only one winner remains. The two important dimensions in terms of this auction type are in other words that it is conducted in an open and ascending manner (McAfee & McMillian 1987). This will be the situation no matter if the bidders shout their bids, if the auctioneer announces the bids or if the bids are submitted through an electronic solution where the current best price is displayed.

The strategy for each single bidder in this kind of auction is to decide a price at which he will stop bidding. The bidder will stay in the auction until he is equivalent whether he wins the auction or not (Menezes et al. 2003). The second auction type which is conducted in an open manner is the Dutch auction. In this auction, the price starts at a high level as initialized by the auctioneer and is eventually lowered until one bidder place his bid at that current price. When dealing with such an auction type, the optimal strategy for each single bidder is also in this auction type to decide a price where he will place his bid. The bidder here will wait until the price reaches this level before he eventually places his bid (Menezes et al. 2003).

The two auctions that are conducted in a sealed manner is the first-price sealed bid and second-price sealed bid, which is sometimes referred to as Vickrey auction. In the first-price sealed bid the different bidders deliver their bids in a sealed manner to the auctioneer where their bids cannot be observed by the other bidders. The first-price sealed bid and the Dutch auction are equivalent in terms of the optimal strategy (Milgrom & Weber 1982). The reason for this is that as mentioned in the Dutch auction is the winner of the auction the bidder who accepts the highest price and this is also in fact how the winner is selected in a first-price auction. The winner in the first-price sealed bid auction is the one who provides the highest bid after the bids are opened or reviewed by the auctioneer (Milgrom & Weber 1982). In procurement auction the situation as mentioned is reversed in that it is the lowest bidders that wins the tender. The first-price auction is the most used auction type in terms of procurement auctions in the public sector. The reason for this is the auction's abilities in terms of creating a competitive environment that ensures value for the tax payers' money.

In a second-price sealed bid auction the bidders submit bids in a sealed manner like the case with the first-price auctions (McAfee & McMillian 1987). The winner here in this type of auction is also the one who provides the highest (lowest in terms of a procurement auction) bid after the bids are opened or reviewed by the auctioneer. The main difference compared to the first-price sealed auction is that the winner that has submitted the highest bid only pays a price equal to the second-highest bid (McAfee & McMillian 1987). The dominant strategy in terms of the Vickrey auction is for the bidder to bid according to his actual valuation of the item (Menezes et al 2003). The reason for this is as mentioned that if the bidder wins the auction he will not pay this value but will pay according to the second-highest value. The second price and the English auction are equivalent in terms of the optimal strategy. In both of the auction the optimal strategy is bid according to the actual value. The price that is paid in both auction types is equal to the valuation of the second highest bid. This is however true only under a certain condition in which we deal with private values and when there are several bidders (Klempere 1999).

An important issue that should be addressed in relation to the different auction types is the problem that is referred to as “the winner’s curse”. This is a problem that occurs in ascending auctions when dealing with common values as described earlier (Klempere 2002). The common model as mentioned implies that the different bidders have the same valuation of the object but where the information with regards to the valuation is differently distributed among the different bidders. What the winner’s curse refers to is the situation where the winner in an ascending auction will be the one who actually overestimates the true value of the object (Klempere 2002).

The bidders participating in an auction should thus be aware of this problem in order to avoid overestimating the true value and thereby placing bids that seems reasonable and realistic. This is especially true for smaller firms that have a lower chance in terms of winning an auction. When the smaller firms then actually win an auction, then this is very likely to be because of the company overestimating the true value of the object (Klempere 2002). Those firms that already know that they have an advantage compared to the other bidders however can be less cautious of this problem. This is because if this party wins the auction this is very likely to be because of its advantage and not because the company has overestimated the true value of the object (Klempere 2002).

It should be noted that the different auction types that are presented above only are four extreme situations and that we might have different auctions types situated in between the different extreme types consisting of a combination of some of the auctions types mentioned above. For instance might an Anglo-Dutch auction be adopted where the properties of an ascending auction and the seal-bid auction are combined (Klempere 2002). In this hybrid form the auction is initialized with an ascending auction. In such an auction the price is as mentioned raised until only one winner remains. In this hybrid form however the price is raised until there are two remaining bidders. The two bidders that are remaining are then in the next phase of the auction required to submit sealed bids (Klempere 2002). In addition to this, might we have situations where a time limit is implemented in which the bidders have to place their bid or that an entry fee is implemented that requires the bidders to pay a price in order to participate in the auction (McAfee & McMillian 1987).

### **3.3.3 Multi-criteria auctions**

The classic auction theory is to a large extent focused on the price as the only dimension in an auction situation. In this classic situation the winner of the auction is the one who typically provides the highest bid or lowest bid. The classic auction situation where price is the only dimension is suitable when dealing with so-called homogenous goods but will have shortcomings when dealing with heterogeneous goods where other dimensions in addition to the price are important. A system where the price is the only criterion when dealing with more complex heterogeneous goods where other dimensions are important might lead to an incentive problem in which the bidders have no incentive to promote quality. This might thus lead to an ex-ante problem in terms of quality.

The bidders have no incentive to promote quality when price is the sole criterion and this dimension will thus be stripped to a minimum level. Because of this ex-ante incentive problem, it is important for the decision makers to be aware of this problem and incorporate several dimensions in its evaluation of the bidders. It is also important that this is communicated to the bidders such that they can adapt according to this and find an optimal strategy in order to win the tender. A growing body within the discipline has however started to incorporate other dimensions in addition to the price in auction

situations. Che (1993) in his paper develop different models that incorporate two-dimension as represented by price and quality in a procurement auction adopted by the government when procuring weapon systems.

In his paper Che (1993) suggests a modification of some of the different auction types that incorporates the different dimension. The first is the first-score seal bid auction, which is a modification of the first-price sealed bid auction, where the auctioneer as the initial stage reveal his scoring function and requirements that must be fulfilled (Che 1993). The bidders then submit their bid and the one with the highest score is the winner of the auction. The second-score seal bid auction, which is a modification of the second-price seal bid auction, is conducted in a similar manner as the first-score auction. The winner that provides the highest score is however only required to match the price-quality combination score as suggested by the second highest bidder (Che 1993). Another variant of this auction type is the so-called second preferred offer where the winner is required to exactly match the price-quality combination and not only a combination that matches the score (Che 1993).

Liu et al. (2000) in their paper incorporates this approach and proposes different mathematical approaches in order to evaluate the different bids. The paper recognizes that contracts in the construction industry are not necessarily won by the party placing the lowest bid. There might be other dimension like quality, safety, time etc that might be of equal or even greater importance and this must be taking into consideration when selecting the winner of the auction. A common theme in terms of these other dimensions that are incorporated in these models is that they are often negotiable measures that are hard to quantify for the parties involved. In addition to this, might the bidders have difficulties in terms of knowing the auctioneers preferences when dealing with several dimensions.

In order to deal with this problem David et al. (2005) propose in their paper that the auctioneer might either use a scoring function or reveal whether the bid that is placed by the party is either better or worse than the current best bid. When revealing the bids' standing in such a way it helps guide the bidder in terms of knowing the auctioneers preferences. Make the scoring function available for the bidders also help guide the bidders in terms of knowing the auctioneer's preferences and this help them to develop an optimal strategy that incorporates the quality dimensions. The literature that addresses these issues that concerns the incorporation of other dimensions than price in an auction,

are however in general terms and provides mathematical constructs in order to attempt to find the optimal design or strategy that either maximizes the auctioneer's utility or the system's efficiency. In our case we are interested in exploring how these other dimensions in practice are evaluated by the parties in the maritime sector and how this is communicated to the different parties. We will later present some cases from the public sector that will help shed light on this and give us an idea of how this in practice can be taken into consideration by the different parties in a tender situation.

### **3.3.4 Auctions and quality incentives**

An important issue in relation to procurement auctions where the evaluation of the bidders depends on several dimension in addition to the price is the quality incentive problem. This problem is related to that the quality dimension receives little focus due to that the auctioneer fails to provide incentive for the parties in order to promote quality. In terms of the quality incentive problem there might be both an ex-post and an ex-ante problem as described by Bergman & Lundberg (2013). The ex-ante problem is as mentioned above connected to that if the auctioneer is interested in promoting quality but only focus on price as his sole criterion when selecting the winner of the auction. The different bidders then have no incentive to promote quality and this is thus stripped to a minimum level. By specifying multi-dimensional criteria and communicating this to the different bidders the bidders will have an incentive to promote this and a certain level of quality that is according to the auctioneer's criteria will thus be promoted.

When the auctioneer during the evaluation process bases his sole criterion on price then this will as addressed by Kirmani & Rao (2000) lead to the problem of adverse selection. This problem is a problem of asymmetric information in which the auction will tend to attract only the weaker bidders in terms of quality. The bidders that promote high quality will tend to stay out of the process due to the criterion in which the auctioneer bases his decision on. The high quality bidders know that the likelihood of winning the auction is low and will thus avoid entering the auction. This theory related to quality uncertainty and hidden information is also addressed in Akerlof's (1970) paper. In his paper the author claim that when buying a car in the used car market the seller will know more with regards to the car and its potential problems than the buyer. The buyer in this case runs the risk of buying what Akerlof refers to as a "lemon".



The ex-post problem is however related to after the auction is finished and the contracted has been agreed upon by the two parties. This issue was addressed by Klein & Leffler (1981) where different measures are suggested in order to cope with this ex-post quality problem. The question in this situation is how one can assure that level of quality that is specified in the contract. This is in particular a problem when the quality is non-verifiable that implies that auctioneer is not able to prove that the contractor is providing a lower level of quality than what is specified in the contract. This is especially a problem when dealing with services. When this is the case, it will be hard to sue the other party because of the auctioneer's problems in terms of proving this case.

The reason that the company might be interested in deterring the quality is because this might give a short term profit for the company. The company providing the goods or service can however deliver a satisfactory quality level and will thereby have chances in terms of renewing the contract. If this is the case, the company will have benefits in terms of future profit and this might give them an incentive to promote quality. The auctioneer might however not know what companies it is dealing with in an auction. Because of this, we both have problems related to asymmetric information and hidden actions (moral hazard) in terms of the company possessing more information with regards to his profit preferences. This problem is in fact a principal-agent problem as identified by McAfee & McMillian (1986) where a principal as described in their paper hires an agent in order to perform a certain task on behalf of the principal. The auctioneer according to their paper corresponds to the principal and the bidder corresponds to the agent that either performs a service or supplies an object to the principal. The principal's problem is then to develop a reward structure in the contract that promotes his preferences in order to avoid hidden actions.

Klein & Leffler (1981) in their paper suggest different ways in order to avoid this problem. One way that in which this problem can be avoided is when it impacts the cheating party's reputation. The party that behaves opportunistically by providing a lower level of quality than what is specified will then be punished by other actors in the market that become aware of the current auctioneer's experience. The other market actors will then possibly exclude the cheating party when running future auctions and the cheating party will thereby lose future income if it decides to behave opportunistically during the current

contract. It is thus clear that selective entry at the initial stage before running the auction will then help prevent this problem. The auctioneer can then exclude the bidders with a bad reputation or if it has received any other signals that might indicate that this is a bidder with a high likelihood of behaving opportunistically ex-post. The concept of reputation, which in fact is a form of impersonal trust, is also closely related to the element of trust (Douma & Schreuder 2013). Trust that is developed over time through continuous interaction between the different parties can help to avoid that a party will behave opportunistically (Douma & Schreuder 2013). When the auctioneer pre-selects suppliers that it trusts, it is thus expected that the supplier will behave less opportunistically and avoid deterring quality ex-post.

Kirmani & Rao (2000) address in their paper that it is possible for the bidders to promote quality prior to the auction by providing different signals. One way in which the bidders can signal quality is by developing strong brand names and by promoting this brand. The auctioneer can then base his decision partly on this when pre-specifying the bidders that are allowed to participate in the auction. It is however also possible to screen the different actors prior to the tender as suggested by Spencer (1973). In terms of this the principal or the auctioneer in our case tries to acquire information with regards to the different parties in order to distort the existing information asymmetry. For instance might the sellers be required to submit information about their earlier records, projects, financial information etc. Kim (1998) in his paper discusses that limiting the number of bidders in an auction will lead to less probability of parties behaving opportunistically. The reason for this they argue, is that in an auction with many bidders the competition will be fierce and this will with a high probability lead to that a very low price is gained by the winner. This might in the next turn lead to the winner failing to provide the required quality and thus is forced to behaving opportunistically ex-post.

Klein & Leffler (1981) in the continuation of their paper however argue that pre-selecting the bidders might still not be sufficient in order to avoid opportunistic behavior by the agent. The decisive factor in terms of the party actually cheating is if the short term gains that are received when providing a low quality level exceeds the future gains. The agent thus then have an incentive to cheat. In order to avoid this problem the auctioneer thus has to increase the future gains such that they exceeds the short term gains by cheating. The length of the contract might have such implications. If a short contract or a trial period

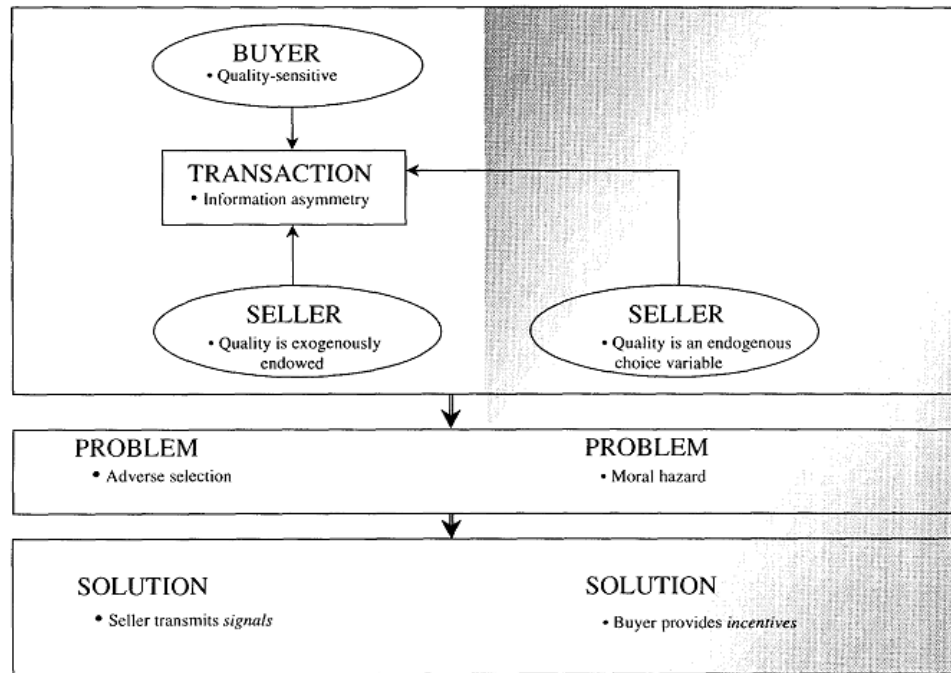
prior to the contract is initialized it is seen that the future gains exceeds the short term profit and the agent will thus have less incentives to cheat by deterring quality. A short contract in combination with a low price during the initial trial period is seen as a good solution in order to avoid cheating.

Another solution as proposed is to introduce a variable element in addition to the fix priced as agreed in the contract. A variable element in the contract might be simpler to connect with the agent's efforts and thus provide him with incentives to avoid cheating. The agent then knows that if it cheats and provides low quality it will affect the variable element in the contract and thereby reduce the future gains. An example of such a variable element might be to introduce an option. Edin & Hermalin (2000) argue in their paper why introducing an option might be a good solution when dealing with principal-agent problems where the quality can be observed by the parties but where it cannot be verified ex-post. An option will introduce what they refer to as a "threat effect" that creates an incentive for the agent to promote quality in the case where the contract is not to be renegotiated.

The authors argue why this is a good solution by referring to a particular case from the movie industry. This problem occurred when Disney and Pixar in cooperation produced the Toy Story movie. Pixar were responsible for developing the movie while Disney handled the marketing. Disney was then in the situation which is analogous to our case in which they cannot verify the quality of the movie that Pixar had developed. If Disney and Pixar then agreed a fix price contract, then Pixar would have an incentive to cheat and provide a low quality movie. Disney can however avoid this problem by introducing an option that gives it the right to cancel the agreement. If this is the case the authors argue that the "threat effect" gives Pixar an incentive to promote quality.

The situation will however be different when the contract can be renegotiated something that will not be introduced here. It is however clear that this case might be analogous to our situation in which the shipping companies or oil companies might have introduced options into the contracts that gives them the right to either acquire additional vessels in the future or extend the time period that is contracted. Both situation will introduce a threat effect and give the other party incentive to promote quality. The reason for this is that if the agent behaves opportunistically in this case the principal will avoid exercising the

option something that will represent a loss from the agent's perspective. The agent's future gains thereby exceed the short term gains from cheating and thus giving the agent an incentive to promote quality. The different problems and possible solutions associated to quality problems in an auction situation are summarized in the figure below.



**Figure 20 - The ex-ante and ex-post problems related to asymmetric information in a buyer-supplier transaction and different solutions to the problem (Kirmani & Rao 2000).**

Much of the existing literature related to procurement auctions and quality is done in connection with the public sector. The reason for this is the importance of securing service that yields a satisfactory quality something which is specifically important in the health care sector. In the health care sector failing to provide services that yield a satisfactory quality can have severe consequences and thus several authors have addressed this issue (Mougeot & Naegelen 2003; Chalkey & Malcomson 1996; Mc Combs & Christianson 1987; Spurgeon & Hicks 2003). In the health care sector there is specifically a trade-off between cost reduction and the quality of the service. The quality of services in the health care sector is in most cases not possible to evaluate until after it has been provided.

Because of this, it is according to Chalkey & Malcomson (1996) important to the design the auction in such a way that it incorporates several dimensions in the evaluation criteria. It is also important to make sure that the bidders have corresponding cost and quality incentives in such a way that quality is not deterred ex-post by the bidder. Since most of

the research is seen in connection with the public sector, it will be interesting to see how the different parties in a private sector such as the maritime industry deals with this problem in practice. The private sector according to Bergman & Lundberg (2013) have greater chance of avoiding this problem due to the fact that the public in most cases because of tender regulations have to run auctions that are open for all companies to enter. It is thus clear that the public sector can rely less on pre-selection of bidders based on the company's reputation and the government's previous experience with the company.

### **3.3.5 Auctions and negotiations**

Another important issue in connection with auctions is the criteria for selecting auctions as the preferred means of acquiring goods and services when comparing with other means such as pure negotiations with suppliers. This issue is closely related to the discussion that compares public procurement with purchasing taking place in the private sector. This is addressed by several authors in the literature (Arlbjørn & Freytang, 2012; Krüger, 2004; Larson, 2009; Hawkins et al. 2011; Tadelis, 2012). The reason for this discussion is that the public sector according to Krüger (2004) has to follow strict regulations in which negotiations in some cases are forbidden. The reason for this is to promote competition in order to ensure value for the tax payers' money. The question is then if this, what Krüger (2004) refer to as "ban" on negotiations, actually undermines the most efficient use of the tax payers' money. The companies in the private sector can however freely select what mechanism it prefers when acquiring goods and services from its suppliers. Tadelis (2012) in his paper address that the most recent literature reports that this flexibility in the private sector actually leads to efficiency gains.

Goldberg (1977) in his articles argues that negotiations are the preferred means when dealing with complex projects. The reason for this is that auctions tend to distort information transfer that is necessary between the buyer and seller. For instance is it necessary for the parties to agree on how they should face unforeseen ex-post problems. Auctions also tend to lead to the problems of adverse selection and moral hazard as mentioned above. Bajari et al. (2009) in their paper attempt to test this case empirically by examining a data set for building contracts awarded in California. Their finding support the theory suggested by Goldberg in which negotiations seems to perform better when dealing with complex projects. An empirical analysis based on public procurement

contract in France conducted by Chong et al. (2009) arrive at the same conclusion in which that auctions are preferred when dealing with simple contracts while negotiations are the preferred means when dealing with more complex contracts.

Subramanian (2009) in his paper suggests several factors that impacts whether one should run an auction or negotiate directly. The author claims that auctions are the preferred means when the number of potential bidders is large, when it is possible to specify the object, when it is important to finish the process as fast as possible and finally when it is important to have a transparent process. Negotiations are however preferred when there are a small number of buyers that are well known, when the relationship is important and when one can experience an increase in the value creation by sharing ideas, when the parties prefer no risk involved and finally when it is important to keep secrets. It is however important to note that the literature that is presented above discusses the two extreme case in which one either choose to run an auction or negotiate directly with the suppliers. We might however have situation where one can have a hybrid combination of the two alternative in which one either negotiate first with potential suppliers and then run an auction or that one at first run an auction before one eventually negotiate with some of the bidders that place bids that satisfies the criteria. Subramanian (2010) introduces the concept “negotiauctions” to describe these hybrid situations.

### **3.4 Quality**

Quality is in the literature defined in several ways. In the early literature quality was defined as excellence where one aspires to reaching one’s maximum standard (Reeves and Bednar, 1994). When defining quality one should however differ between services and physical goods. Quality in terms of physical goods is by Crosby (1979) defined as conforming to the customers’ requirements. Garvin (1983) however links quality and the perception of it to the amount of failures associated to the product. The amount of failures and quality in other words involves conforming to specifications. If a product does not conform to the specifications as developed by the customer the production system for the customer is not going to function properly and the amount of failures are likely to increase.

In the literature it is also suggested that one should differ between design quality and specification conformance where design quality is related to the physical attributes or

features associated to the product while the other related to how the product is in accordance to the specifications developed by the customers (Reeves and Bednar, 1994). Quality in relation to services however cannot be defined in a similar manner in all cases due to the fact that services deal with something that is intangible. Because of this, it is not possible to evaluate and verify quality in advance in the same manner as the case is with physical goods. Service quality therefore deals with the customers' expectations and the actual performance of company providing the service (Parasuraman et al. 1985). Quality in relation to services does in other words concern conformance to customer expectations.

Lehtinen and Lehtinen (1982) claim that quality has three different dimensions. The first dimension is the physical dimension that deals with all tangible aspects of a service like for instance the equipment. Another dimension is the corporate dimension in which the service provider's image matters. The last quality dimension is the one that deals with the intangible factor that is created in the interaction between the customer and the provider. These dimensions are in accordance with Grönroos (2001) that claims that the perceived service quality consists of technical and the functional quality dimensions. The technical dimension involves the outcome that the customer is able to observe ex-post while the functional dimension concerns the process that the customer is able to observe during the provision of the service. In addition to this, is the image introduced as an additional dimension. In terms of the functional dimension it is related to what is actually provided to the customer while the functional corresponds to how this is provided to the customer. The reason for this is that services are produced in an interaction with the customer and the company and this process will thus determine how it is provided to the customer.

The perceived service quality occur ex-post after the process is over and the service has been provided to the customer. The customers will before acquiring the services have certain expectations to the service that will be provided to their side. When the process is over and the service has been provided, the customer will compare these expectations with the actual quality of the service that is perceived during the process and ex-post. This comparison will thus result in what Grönroos (1984) refers to as "the perceived quality of the service". Marketing, branding, advertising and other promotional activities will contribute to raising the customers' expectations. Marketing activities might in other words serve as a signal of product in the same way as marketing activities signal quality in terms

of actual product quality for physical product as suggested by Kirmani & Rao (2000). In relation to services marketing activities will in other words signal quality and help raise the customers' expectations. The customer will then at the initial stage compare these expectations with what is perceived during the process.

Takeuchi & Quelch (1983) in their article however argue that product quality and service quality are interrelated and should be seen in connection with each other. According to them quality is defined in terms of the customers and their perception of it. Quality might in this case be related to both the physical product that is provided along with the service element that involves such as aftermarket services. Kirmani & Rao (2000) argue in their article that different marketing activities might function as a signal in terms of the actual product quality. In terms of this, the different aftermarket services might help build the company's brand name which in the next turn help signal the product quality.

Product quality and services are also interrelated in the way that if the product quality is proper then this will make sure that there are fewer failures associated to the product, which in the next turn imply that customer services are less needed (Takeuchi & Quelch 1983). If there are many defects associated to the product, the customer service will in other words detect this at an early stage. Takeuchi & Quelch (1983) also emphasize that how quality is perceived by the customer is influenced by different factors at the different stages. The authors suggest that before the purchase the customers' perceptions might be influenced by factors such as the company's brand name, reputation and their previous interaction with the supplier. During the purchase stage the customer's perception might be influenced by warranties, financial terms etc. The customers' perceptions will finally (after the purchase) be influenced by factors such as aftermarket services, installation and spare parts etc.

It is also important to see quality as an integral part of the total value that is perceived by the customer. According to Ravald & Grönroos (1996) perceived customer value can be seen as consisting of the perceived benefits and the perceived sacrifices by the customer. The sacrifices are to a large extent related to factors such as product failures, repairs etc and it is thus seen that product quality is important in this relation. The perceived benefits however relates to the perceived quality by the customer which is closely related to the service element and the perception of it. Such factors might be superior aftermarket



services and attributes associated to the product. In order to understand how the customer perceives quality it is necessary to see this in relation the customer’s value chain and the connection to the company’s value chain (Ravald & Grönroos 1996). It is thus clear from this definition that how the customer perceive value is different from customer to customer something that implies that how the customer perceives quality also might differ to some extent from customer to customer.

An important concept which is closely interconnected with quality is the concept of total cost of ownership. This concept is also referred to as “life-cycle buying” or “life-cycle costs” according to Takeuchi & Quelch (1983). The concept involves that a company should not only base their decision on price when acquiring a product but should rather focus on the total costs associated with the product throughout its entire lifetime. This in other words involves costs that occur in connection with acquiring, using, maintaining and disposing the product (Ellram & Siferd 1993). This concept in an excellent way incorporates all the quality dimensions that have been discussed so far in addition to other dimensions that might impact the decision makers’ evaluation in a tender situation.

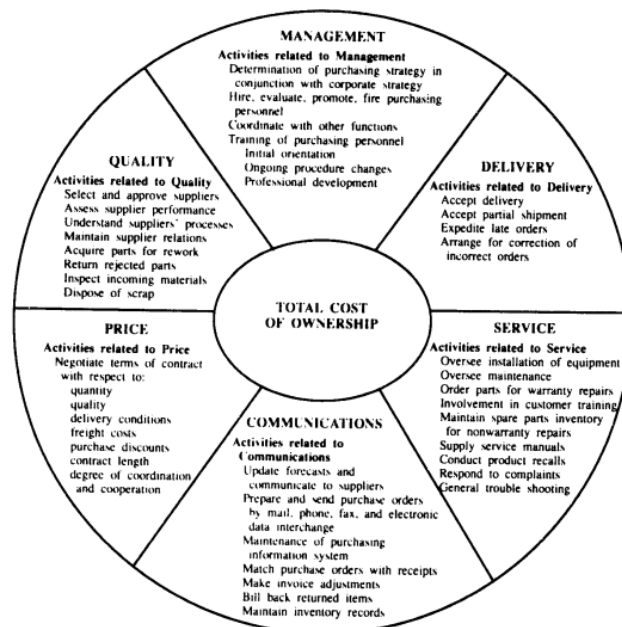


Figure 21 - The Total Cost of Ownership concept and its different dimensions (Ellram & Siferd 1993).

A poor product quality might for instance be reflected in that the costs in term of repairing the product and product failures will be significant. When a company that acquires a product or a service base their decision on the total cost of ownership concept rather than

solely basing their decision on price, then this will be beneficial for suppliers that add quality and thus charge a price that is greater than their competitor. The concept also incorporates the service quality dimension in that aftermarket services and the costs that the supplier spend on this will be taking into consideration in the relative price when comparing different suppliers. A company that provides supreme aftermarket service throughout the entire lifetime of the product by providing spare parts, repairs will benefit when such an approach is adapted by a company when comparing different suppliers in a tender situation. In the figure above all the important dimensions in connection with the concept is summarized.

### ***3.5 Public tendering practices***

#### **3.5.1 General framework**

As mentioned in the introduction does the two EU directives, European procurement directive 2004/17 and 2004/18, prohibit competitive tendering as a means of acquiring goods and services within certain threshold (ec.europa.eu 2014a). These directives must be followed by the EU member states and is thus implemented into each individual country's national legislation. Norway and the other EFTA members through the EEA agreement also are obliged to follow the rules governed by the two directives in order to get access to EU's inner market. The basic principle behind the implementation is connected to the underlying idea behind the foundation of the European Union that implies a free internal market in the EU where capital, people, goods and services can float freely (ec.europa.eu 2014b). When the authorities in the different member states issue tenders, which are open to all the companies in the EU, then this helps to create a competitive playing field that exactly promotes the abovementioned factors. Competitive tendering and the competitive playing field it provides is also in general a good mechanism in order to ensure value for the tax payer's money.

Because of this extensive regulation with regards to tendering as governed by the two directives, it is important to have transparent and accountable processes. The reason this is that the actors might sue the government if the tender has not been in accordance with the two directives. Transparency and accountability are thus two important dimensions in a public tender (Arnbjørn and Freytag 2012). Public procurement is also because of this characterized as being process driven in which the actors have to follow the procedures as

suggested by the legislation carefully. The tendering processes in the public are also heavily influenced by political goals and objective. In a tender the public might for instance be interested in promoting local materials, local workers etc (Weele 2010). The tendering process is also budget driven in that the local politicians are focused on their budget as provided by central authorities (Arlbjørn and Freytag, 2012). Because of this, the local politicians tend to focus spending on a year to year basis in contrast to focusing on the total costs over several years as the practice is in most cases in the private sector (Weele 2010).

There is an extensive framework that regulates the tendering practice in the tendering sector. This framework will thus not in detail be addressed in this relation. It is however important to have some insight with regards to the legislation that concerns the procurement procedures and the procurement process. When gaining some insight with regards to this, it will be possible to complement and contrast our case connected to the maritime sector. The framework promotes different procedures to be used in various situations. The different procedures that can be used in a tender situation are open procedure, restricted procedure, negotiated procedure and design contest (Weele 2010). The open procedure implies that all actors within the EU are allowed to place their bid. All the documents with the specific demands and specification are thus available to all parties and it is typically made available electronically on [ted.europa.eu](http://ted.europa.eu).

The restricted procedure however involves a pre-selection stage (Weele 2010). All the parties that are interested in placing a bid are however at the initial stage allowed to show their interest. All these actors that are interested in placing a bid are then carefully pre-selected after providing the relevant information (responding to the request for information) that will be used during this phase (van Weele 2010). The pre-selection phase might be based on criteria such as accounting figures, previous projects etc. The competitive dialogue procedure is used only in special situations where the project typically is complex (Weele 2010). That the project is complex implies that it is hard to specify what is actually required or describe the terms and other requirements associated to the project. This procedure however also involves a prequalification phase in a similar manner like the restricted procedure (van Weele 2010). After this stage the company will consult the prequalified parties with regards to possible solutions to the project. After this

phase, it will be possible to develop a specification and the prequalified contenders can place their bids.

Negotiations are only allowed in special situations according to the legislation and is thus used only occasionally by the parties. When the parties follow the negotiation procedure the authorities negotiate directly with the parties. There might prior to the negotiation be a prequalification phase in a similar manner like the restricted procedure (Weele 2010). This procedure is however only allowed to be applied in situation where the bids were not sufficient or where the bids received were not acceptable, the solution is too specific such that few suppliers are available, there is not enough time etc (Weele 2010). The last procedure that is available is the design contest procedure. This procedure is a design competition where the parties propose different designs and solutions that are eventually evaluated by a jury consisting of experts within the area (Weele 2010). How the contest should be designed is up to the procuring authority to decide. It is however important to note that regardless of what procedure that is applied the demand in terms of accountability and transparency are still valid. This amongst other implies that the decision with regards to who has been awarded the contract should be published publicly.

With regards to the procurement process, in the public sector it is first of all in the specification determination stage important to avoid favoring any of the companies or nations. This is the case when the specifications are tailored to one specific company or to the companies in only one specific European member state (Weele 2010). It is also important during this stage to exclude members if they have been involved earlier in the process. The reason for this is that this might give these actors a competitive advantage and they must thus be excluded in the continuation of the tender (Weele 2010). During the supplier selection stage, the important issues are the different criteria that should be used to pre-qualify the different parties. One might here separate between exclusion criteria and suitability criteria (Weele 2010). Exclusion criteria are related to if the companies have been previously involved in any corruption cases or other criminal activities. In addition to this, might ethical issues and eventual financial issues matter during this stage (Weele 2010).

The suitability criteria are however related to the performances of the companies with regards to financial and technical issues. An important manner is however that the parties

are treated on a fair ground where none of the parties are discriminated. When it comes to the evaluation stage where the winner of the tender is selected, the awarding criteria must be emphasized by the authorities. The authority might then award the contract based on two important aspects. The first is to award the contract based on the party that simply provides the lowest price. The other method to evaluate the bids is by emphasizing the economically most advantageous bid (Weele 2010). When this is the case, other factors that price such as service, functionality, environmental issues etc. might be emphasized. The price then in the continuation need to be weighed with these other factors and it is thus required that the government communicates the different factors will be weighed. It is also required that the government publicly announces who wins the contract (Weele 2010).

### **3.5.2 Examples from the bus sector**

In this sub-chapter two tenders from the bus sector will be highlighted. The first example is related to the tendering of bus transportation services in the Ryfylke area which is a district that is situated in northeastern part of the Rogaland County. The second example is from the Østfold County and is also related to the tendering of bus transportation services. This specific case is however related to excursions and other events and is thus not on a regular basis. These two tenders like most of the other Norwegian tenders are published on the webpage [www.doffin.no](http://www.doffin.no) where the relevant documents and other relevant information can be accessed. The webpage provides announcements with regards to that a tender will be issued in the future, that a tender has been issued and the winner of tender.

In the tender documents from the Ryfylke tender it can be seen from the tender documents the relevant criteria that are used to evaluate the different bidders. In the documents that are accessible to all parties it is specified that it is an open procedure where the most economical advantageous bidder will be awarded the contract. The economically most advantageous tender is based on three criteria: price, bus standards/environment and the quality of service that is being provided (doffin.no 2014a). The bus standard/environment criteria involves such as the maximum ages of buses, average bus age, buses using environmental friendly fuel, numbers of buses with seats greater than the minimum requirements and HSE-measures (doffin.no 2014a).

The quality of service criteria however involves such as the number of spare buses, quality system, information systems, customer service etc (doffin.no 2014a). In the tender documents it is also specified how the different criteria are weighed. The price is according to this weighed 87 %, the bus standard 9% and quality of service 4 % (doffin.no 2014a). In the evaluation the bidder is for each of the criteria given a score from 1-10 where 10 is the best score. The score is then multiplied with the relevant percentage and the bidder is given a final score that can be compared with the other bidders.

The second example from the Østfold County is also an open tender where the most economically advantageous bidder is selected. In this tender the most economically advantageous bid is also based on three criteria: Price, quality and service (doffin.no 2014b). The quality criterion is related to such as the age of the vehicles and the standard of the vehicles. The service criterion however is related to flexibility in terms of changing orders, cancellation of orders, special arrangements in terms of the transportation etc (doffin.no 2014b). According to the documents the price is weighed 60 %, quality 20 % and service 20 %. In terms of the quality and service criteria, the bidders are given a score between 1-10 where 10 is the best while in terms of the price the score is calculated based on the cheapest bid/bidder's price x 10. The exception is the cheapest bidder that is awarded the score 10 (doffin.no 2014b).

In both of the two tenders the bidders are required to satisfy certain criteria in order to be considered in the evaluation process. This is done as a screening mechanism as mentioned in the auction part in order to avoid attracting bidders in a bad financial situation that won't be able to fulfill the contract. If this is the case and the party goes bankrupt, the authority has to issue a new tender. Issuing a new tender might be costly in terms of that the authority might hire something to do the job on a temporary basis in addition to that all the formal procedures must be followed. In order to avoid this, the bidders must thus submit information with regards to the financial situation, bank confirmation etc. It must also submit police certificates in order to show that the management has not been previously involved in any illegal activities like corruption etc.

Another interesting issue is how the contracts are set up. In the tender issued by Østfold County that concerns bus transportation services related to excursions and other events the contract length is three years with an option for the contracting authority to extend the

contract one year on same terms (doffin.no 2014b). Since the quality and the service criteria are weighted 20 % each, this is to be expected in order to avoid quality deterrence as discussed. In the other tender case discussed quality is not emphasized to the same extent and it is thus not take the same measures in order to avoid quality deterrence. In this case the contract is designed as a gross contract where the operator is responsible for the associated costs while the contracting authority is responsible in terms of managing the associated income.

### **3.5.3 Examples from the maritime sector**

In a report by Sunde et al. (2008) the current tendering practice in the maritime transportation sector is assessed. In this relation several examples of tenders are evaluated and we will here present two of the cases that are mentioned in the report. The first case is a tender that was issued by the Møre and Romsdal Country in 2008 related to fast ferry transportation in this region. In this tender the winner was awarded based on the most economically advantageous bid. The evaluation criteria were price, age of the vessel and quality. The age of the vessel is based on the year it is built. The quality criterion concerns the readiness of spare vessels/alternative transportation for the passengers, cleaning and maintenance of the vessel facilities.

In this case the price is weighed 35 %, the age of vessel 35 % and quality 30 %. For each of the criteria the bidders are given a score from 1-5 (where 5 is the best score) that are eventually multiplied with the weighing measures. By summing these three each bidder will be given score that can be compared in order to select the winner. Another consideration in relation to this case is the contract terms. The length of the contract is 6 years but the contract authority however has the opportunity to extend the contract by 2 years. The contracting authority does in other words have an option that it can exert at the end of the contract. This will as mentioned help avoid that the quality will be deterred by the operator due to the fact that an incentive has been provided. The contract is also a gross contract where the operator receives as fixed amount compared to the net contract where the operator is responsible for the income side.

Another example that is mentioned in the report is a case from the Oslo area that also concerns fast ferry transportation. In this tender the evaluation criteria was price,

quality/functionality of the vessels, environmental impact of the operations and how the operations are planned and carried out. The different factor was weighed and evaluated in the following manner: Price 50-65 %, Quality/functionality of the vessels 15-20 %, environmental impact of the operations 15-20 % and operations 5-10 %. In this tender the contracting authority also had the opportunity to extend the contract after the five year had expired. This does as mentioned in same way help to provide an incentive in order to avoid quality deterrence. The contract was also in this case a gross contract.

### ***3.6 Monopolistic Competition***

According to basic microeconomic theory there are different types of market structures where perfect competition and monopoly represent the respective extremities (Pindyck & Rubinfeld 2013). A market with perfect competition is characterized in that there are several buyer and sellers, that none of the actors are able to impact the price, homogeneous products where the consumer are indifferent in terms of the producers, free entry and full information (Pindyck & Rubinfeld 2013). The other extreme is the monopoly situation where there is only one seller in the market supplying the product or service. A company in a monopoly is faced with a downward sloping demand curve and it can freely determine the price based on the market elasticity. The monopolist will attempt to maximize his profit by considering the marginal revenue in connection with his marginal cost (Pindyck & Rubinfeld 2013).

In between the two extremities we however have several other market structures where one of them is monopolistic competition as introduced by Chamberlain (1965). This can be perceived to be a mix of the two different market structures mentioned above. This market structure implies that there are several buyers and sellers in the market. Compared to two other market types we however here deal with heterogeneous, differentiated products. This implies that the products that are offered by the different producers are only close substitutes to each other. The unique factor that characterizes this market structure is that each producer has monopoly power within its respective market segment. This implies that the producer within this market segment can in reality behave like a monopolist where he determines the price accordingly. The market segment is however not protected completely from competition since the competitors' products are close substitutes. In



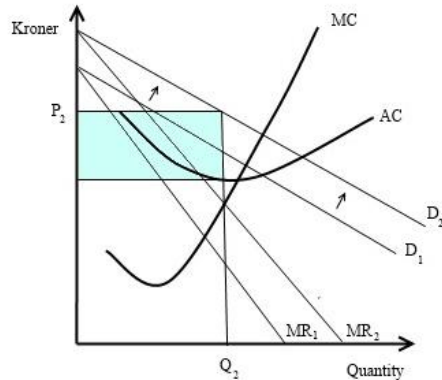
addition to this can new actors freely enter the market and thus attempt to imitate the company's product.

In order to achieve monopoly power within its respective market segment or in order to develop a new market segment where monopoly power can be exerted, the company must attempt to differentiate its product. Product differentiation can be defined as a way of separating one's product or service from those of its competitors in a way that it alters the buyer's preferences (Chamberlain 1965). It is suggested by several authors (Chamberlain 1965; Porter 1976; Breit & Ransom 1971) that product differentiation is both related to tangible and intangible differences in terms of the products or services offered by the different companies. The important thing is thus how this is perceived by the customer.

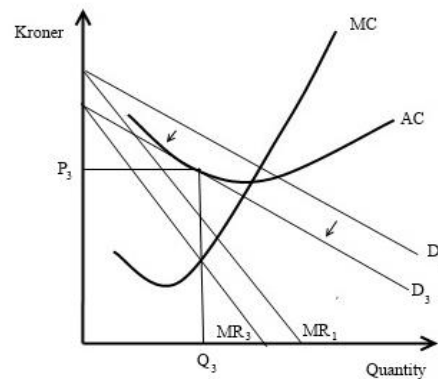
The tangible differences are related to the physical attributes or characteristics of the product or the service. This might for instance be related to the design of the product or that the product is produced using more solid materials. The intangible differences however are related to factors such as brands, image, trademark etc. In order for a company to differentiate its product it is thus not necessarily related to the physical attributes of the product. The important thing is what the customers perceive. If the customers perceive that a Gant shirt is worth more than any other shirt, then this is what matters in terms of the company's ability to gain monopoly power in this segment which eventually enables it to raise its price. The intangible differences can be achieved through advertising, marketing and other activities that help ensure a strong company brand.

In order for a company to gain monopoly power within its respective market segment and in order to develop a new market segment where monopoly power can be exerted, the companies must attempt to differentiate their product and services (Chamberlain 1965). Product differentiation is thus the strategy of the firm in such a situation. This strategy if successful will lead to a shift in the demand curve as shown in the diagram below. The company will then in the short term be able to exert a monopolist profit. In the long term the competitors and new entrants will however to a certain degree be able to imitate the uniqueness of the product in addition to that new substitutes might be introduced into the market that are perceived in the same manner as the company's product. In the long term the demand curve will because of this shift downwards until zero economic profit can be exerted, which is the long-term equilibrium for the company as identified by Chamberlain

(1965). In order to exert profit on a short term basis as the companies must thus continuously attempt to differentiate their products and services by creating tangible and intangible differences as mentioned above.



**Figure 22 - Short term profit under monopolistic competition. Figure adapted from Waldman & Jensen (2013) p. 431**



**Figure 23 - Long term profit under monopolistic competition. Figure adapted from Waldman & Jensen (2013) p. 431**

### 3.7 Competitive advantage

According to Porter (1985) there are two ways in which a company can achieve a competitive advantage. A company can either gain a competitive advantage through providing lower costs than their competitors or by adopting a differentiation strategy. It is also possible for a company to adopt a focus strategy where one of the two strategies is applied in a narrow market segment. The cost leadership strategy implies that a company manages to achieve lower costs than their competitor. If the company manages to provide lower cost than their competitors then this will eventually translate into greater profit for the company. Differentiation however implies that the company strives to achieve uniqueness in terms of certain attributes that are appreciated the customer. If the company succeeds with this the company will be able to charge a higher price in the market. Differentiation can as mentioned earlier in the previous sub-chapter be in terms of tangible attributes related to the products in addition to more intangible factors such as branding, image, additional services provided along with the product etc.

The most important issue in relation to differentiation is according to Porter (1985) is that the uniqueness is actually valued by the customer and that he is able to perceive how this is valuable to him. What is valuable to the customer can be seen in relation to his value chain

and how the company manages to influence this. Value can be achieved either through that the company manages to lower the customer's costs or that it manages to influence the customer's result (Porter 1985). The costs can be lowered and the results can be improved through the company's value chain and existing interlinks with the customer's value chain. The value chain as mentioned in relation to purchasing and its role consist of primary and secondary activities where the primary activities are directly related to in the transformation and production of the product or service that is provided to the customer while the secondary activities support these activities. It is these activities in connection with the customer's activities in his value chain that help describe how the company manages to differentiate itself from their competitor by lowering customer's cost or by improving the customer's results (Porter 1985).

One example of this might be that a company provides supreme services in addition to the product that impacts the downtime of the customer's service or product. For instance might an airline company, a bus company or any other company engaged in transportation services experience losses in the event of a situation where one of the airplanes or buses are out of function. This might then entail losses in terms of potential delays, passenger compensation and its impact on the company's reputation or image. The supplier can then lower these potential costs that arise in such a situation by providing supreme service that enables the company to have the airplane or buses up and running again during a short period of time or by providing alternatives during this downtime that limits these losses. It is thus clear that the service activity in the supplier's value chain impacts the customer's operation activity in his value chain.

This is however only one example and there might be several such links between the supplier and customer's value chain. The more links that are created between the customer's value chain and the company's value chain the stronger is the uniqueness created and thereby the stronger is the achieved differentiation (Porter 1985). This is important because of as mentioned might the competitors after some time attempt to imitate this uniqueness and thus will the competitive advantage achieved earlier be diminished.

Another important issue to note is that it is not only enough to lower the customer's costs or improve the customer's results. The customer must be aware of how the value is being

created in relation to the customer. This is however not always possible to perceive by the customer (Porter 1985). A product's influence on the customer's results might not always be possible to judge until after the product has been used by the company. The same is also the case in terms of services in that it is hard to judge for the company how the company actually benefits from the service that is being provided. In order to be able to extract a premium the company providing the product or service must thus provide a signal to the customer (Porter 1985). The customer can use this signal in order to judge how and if the product or service influences the company profit by improving lowering the customer's costs or by improving the customer's results. What is important for the customer is another words what it perceives as also identified by Ravalid & Grönroos (1996) as mentioned earlier that separates between perceived customer benefits and perceived customer sacrifices. A signal of this can be created in terms of marketing measures, branding, image, trademarks etc (Porter 1985).

### ***3.8 Literature summary***

In this literature review we first of all started out general with providing a general overview of the theory associated to supply chain management and purchasing. This purpose of this was to attempt to explain and frame tendering within the language of this and help us understand the possible steps in the purchasing process. In the continuation auctions and the most important theory connected to this was addressed. The purpose of this was to clarify the auction concept and how it relates to tendering. In this we have seen that tendering is in fact a reversed auction where one buyer is interested in receiving bids from several suppliers. In relation to the auction part it was also addressed the importance of the auctioneer incorporating other dimension in addition to the price when the evaluating the different bids received.

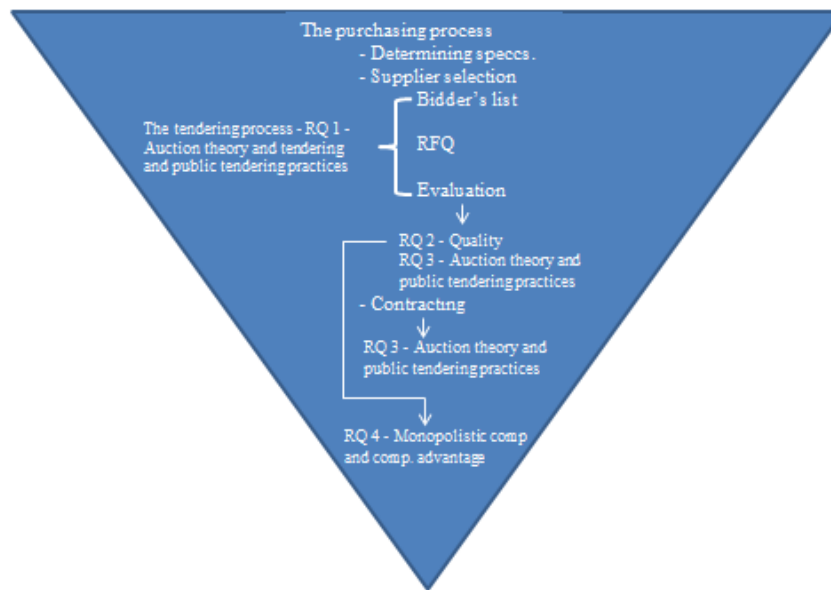
In the continuation quality and incentive problems was addressed. In this it was addressed that here might be an ex-ante and ex-post problem when the auction is based on quality as an additional dimension. Different measures in order to handle these problems was addressed in addition to the existing literature's emphasize on the public sector in relation to such quality problems. At last were auctions in relation to negotiations addressed. It was here seen that negotiations tended to be the preferred means when dealing with more

complex projects as supported by the literature. It was however also emphasized that a combination of two is possible.

The next part provided an overview of quality and how the literature defines this concept. The reason is as mentioned that quality might be related to several factors and it thus important to provide a clarification of this term. The literature provides us with an understanding of quality in which it should be seen as a total concept where product quality, services and signals of these two in terms of brands, image etc should be included in the concept and not only related to the physical products in term of conformance to the customer's requirements, product failures etc. In the next part of the literature review the tendering practice in the public sector was outlined. This was addressed in order to complement and contrast the tendering practice in the private sector. In this we first of all explain the general tendering framework and the purpose of this in relation to the EU regulations. Tenders in two respective sectors was addressed and this helped clarify other dimensions in addition to price in these sectors in addition to how these are balanced when evaluating a tender using a weighing score. How the contracts are designed and how the parties are screened by providing different information was also emphasized.

In the last part the theory concerning monopolistic competition and how a company can achieve a competitive advantage over its competitor was addressed. This is addressed in order to help explain how the different factors in the tender relate to the different actors and thereby the cluster's ability to face global competition. It was here explained that the parties must continuously attempt to differentiate its product or service in order to shift the demand curve outward by promoting tangible differences related to product in addition to intangible differences such as marketing, branding etc.

It was also addressed that company can gain a competitive advantage through adopting such a differentiation strategy. The company should see differentiation in connection with the customer value chain and how one can lower the customers cost or improve the customer results. It is also important to signal this value that is created in order to be able to exert a premium. The different parts in the literature and how they are connected to the research questions are summarized in the figure below.



**Figure 24 - Figure summarizing literature in connection with research questions.**

## 4.0 METHODOLOGY

### 4.1 Research Design

The purpose of the research design according to Yin (1994) is to provide a basis to be able to answer the stated research questions and to derive a conclusion. It is however important to separate between research design and research methods. Research design refers to what kind of data that is necessary in order to provide answers to the research question and also involve how this data will provide the researcher with answers to his promoted research questions (Yin 1994). Research method however focuses on the type of data collection method that is being used, for instance it specifies whether quantitative or qualitative data should be use or if a mix of the two methods is required (Yin 1994). With regards to research design it can be classified in to experimental design, non-experimental design and quasi experiments.

What will be relevant for this study is the non-experimental design which includes the case study (Yin 1994). The case study approach implies that an analysis of a single unit is conducted. The nature of this analysis can either be qualitative or quantitative, even though the qualitative approach is the most common in this setting (Yin 1994). The reasoning for conducting case studies is related to that the case study method in particular in a good way

allows for answering research questions on the form why and how. It does in addition to this provide a full explanation of the complexity and the nature of real word phenomenon (Voss et al. 2002). Case studies are also a good method when we are interested in exploring a certain phenomenon and when this is considered to be unknown (Voss et al. 2002).

In this study we are as mentioned interested in exploring the tendering process and quality in each different link. Because of this, we are interested in exploring a phenomenon in its natural context. The majority of the research questions in this study are also as mentioned how questions and since this is the fact a case study is considered a good approach. Since we are interested in the tendering process in each different link (equipment supplier-shipyard, shipyard-shipping company, shipping company-oil company) we would however adopt a multiple case study approach. This implies that a total of three cases, one in each link, were explored in detail. The reason behind this is that we would predict to get different perspectives in each different case. This can also help to see the process and quality in supply chain perspective and whether what happens downstream in the supply chain has implications for the upstream actors.

The rationale for this is in other words what Yin (1994) refer to as theoretical replication where we expect to produce different results in order to contrast and compare the different cases. Several cases were also used in order to attempt to partly replicate and verify what was said in the other cases. This was possible since the informants also possessed knowledge with regards to the other actors. The informants at Ulstein Group for instance also possessed knowledge with regards to the oil companies and their practice due to their involvement together with the shipping companies in some of these cases. Since Ulstein Group is present in almost the entire value chain, the informants thus possessed knowledge also with regards to some of the issues in the other cases. The informant at Remøy Shipping, Karsten Sævik, due to his previous position as COO at Ulstein Shipbuilding also possessed knowledge with regards to the other link (shipyards-shipping company). A multiple case study was thus also conducted in order to also partly ensure what Yin (1994) refers to as literal replication, where one conduct several cases in order to secure that the same results are also achieved. This also helps strengthen the validity.

In relation to research design and the abovementioned, is an important factor to identify the unit of analysis. The unit of analysis refers to what is being analyzed in the study or more specifically what kind of entity that underpins the analysis. The entity that forms the basis of the analysis can either be individuals, groups, firms etc (Yin 1994). The unit of analysis in this study will be the tendering processes in each different link in the marine service supply chain. The reason for this is that we as mentioned are interested in looking at the tendering process in each link, how it takes place and the importance of the different quality factors. These factors will also as mentioned be connected to how they improve the actors' ability to tackle global competition.

## **4.2 Data Collection**

Concerning the data collection part we have that the data that is collected can be classified into two categories. The two classifications are modeled data and empirical data (Ellram 1996). Empirical data involves data from the real world that are typically collected through conduction surveys or by using case studies (Ellram 1996). In this study we will deal with real world (empirical) data since the study is based on multiple case studies. In order to explore the tendering process that is a real world phenomenon it is exactly necessary to collect data that describes this real world phenomenon in the best possible way. This study will be of a qualitative nature involving a multiple case study. The data that is acquired might be separated into primary data and secondary data. In a qualitative research study we might have interviews, data from focus group or observations as our primary data sources. The secondary data sources can be accounting reports, journal articles, newspapers articles etc (Anderson 2010).

### **4.2.1 Primary data**

In this study the primary data source has been interviews. The advantages related to conducting interviews are according to Yin (1994) that the interview is targeted in terms of that the focus is put directly on the topic. It is also in addition this advantageous when the case study involves human behavior and human affairs. In our situation this is the case in that decision makers are involved in the tendering processes exerting a certain influence. Collecting data based on interviews can however imply a problem in terms of that they involve verbal consideration that can easily lead to bias due to for instance the questions



that are asked during the interview and that the informant according to these question gives answers that the interviewer wants to hear (Yin 2003).

Observation is another method that could be considered used in such a context since the researcher should be interested in using several methods in order to secure the construct validity in a best possible way. Observations were however not used in this thesis due to its property in terms of being time-consuming in addition to it demanding a lot of resources. If this should be possible in this thesis, it would require the thesis author to work in companies in the different link for a period of time in order to observe the practices. This is thus too time-consuming in terms of the scope of this thesis and because of this interviews were the main primary data source used in this thesis.

The interviews were conducted in relation to the principle informants. The principle informants are the persons that are best informed about the phenomenon being study or the data being researched (Voss et al. 2002). The key informants in relation to this thesis are the persons in the shipping companies, shipyard, equipment supplier that are involved in the tendering process and that have detailed knowledge concerning the different quality factors and the importance of these. The informants that were selected all have detailed knowledge concerning the tendering process in relation to their company.

In relation to the first case study, that concerns the equipment suppliers and the shipyards' tender processes the marketing director at Brunvoll, Per Olav Løkseth, was interviewed. In his position as a marketing director he possesses detailed knowledge with regards to these processes and the different procedures when equipment like thrusters is sold to the shipyards. In the second case, CEO Gunvor Ulstein and Deputy-CEO Tore Ulstein at Ulstein Group were interviewed that both possesses detailed knowledge with regards to the tender process in this link in addition to the market and its future prospects. The last interview was conducted in relation to Remøy Shipping and their informant CEO Karsten Sævik. In his position as a CEO he possesses detailed knowledge with regards to the oil companies' tenders and the market in relation to this.

The interviews were conducted face-to-face where some follow-up questions were asked via e-mail. The advantage related to conducting interviews face-to-face compared to conducting interview via e-mail or telephone is that face-to-face interviews enable the

interviewer to observe the informants body language. All the interviews were conducted in a structured manner where an interview guide was developed prior to the interview as can be found in the appendix. The informant was however allowed to speak freely and some of the questions in the interview guide were developed in an open manner that invited the informant to speak freely. The informants were asked if the interview could be recorded and two of the interviews were according to this recorded and eventually transcribed after the interview was finished. The transcriptions were sent to the informant afterwards. In relation to the interview that was not recorded, notes were taken during the interview that was elaborated immediately when the interview was finished.

According to Jacobsen (2005) there are both advantages and disadvantages related to recording interviews. The advantages of recording interviews is clear in that it helps the interviewer in terms of that it eases the focus in terms of taking notes during the interview something that lets the interviewer focus on asking questions and keep eye contact with informant during the interview. The disadvantages might however be that the recording imposes a restriction in terms of the information provided in that the informant might not feel free to share all relevant information.

#### **4.2.2 Secondary data**

Secondary data, which is data collected by another party, that was used in this thesis are tendering documents, conference presentations, newspaper articles, academic articles, textbooks and company annual reports. The tendering documents were provided after requesting the informant if this could be provided. In the appendix some examples of these tendering documents can be found where amongst other extracts from the yards specification can be found that provides useful information with regards to some of the information that the informant provided during the interview. In the appendix an example of an invitation to tender on behalf of one contractor and an oil company can be found that exemplifies the importance of documenting safety and the company's track record in terms of this in addition to the crew and its qualifications.

A conference presentation that is used in this thesis is first of all a presentation that was held by Bourbon COO, G ael Bodenes, at the annual NCE Maritime Conference in  lesund. In this presentation he addresses what is important in relation to Bourbon in order

to succeed with their long term strategy. This was used in order to complement what was mentioned in relation to the information provided in the interview. It was also used as a reference point when developing the interview guide. The second conference presentation used in this paper is related to Statoil and their evaluation of the environmental performance in alternative transport solutions in their upstream logistics. This presentation was held by green logistics project manager at Statoil, Karoline Norlund, at Molde University College. This provides interesting consideration with regards to different approaches in order to reducing the fuel consumption and improving the efficiency in relation to the offshore supply vessels.

In order to find the most relevant journal articles in relation to the literature review part a thorough search in all the journal databases such as Scientific Direct, ProQuest and Google Scholar was conducted. The maritime companies' annual reports were finally investigated in order to attempt to find relevant information. In relation to this, it was in Farstad Shipping's annual report found an interesting overview over their contract structure that was used in order to provide evidence of options and the importance of this as also was emphasized by the informant.

### ***4.3 Validity & Reliability***

Two important terms in relation to a study is validity and reliability. Validity might according to Yin be separated into construct validity, internal validity and external validity. Construct validity refers to if we are able to use the right measures in order to capture the phenomenon or concepts that it currently being studied. In other words that one actually measures what is intended to be measured. Internal validity however refers to the ability to establish a relationship springing from causality rather than a spurious relationship where no of the conditions leads any of the other conditions (Voss et al. 2002). External validity refers to if it is possible to generalize the findings beyond the study being conducted (Voss et al. 2002).

The construct validity in this thesis was first of all dealt with in that several sources of data were used. As mentioned above is the study based on interviews in each link that is as far as possible supported by secondary data such as tender documents, conference presentation and other relevant secondary data sources. In addition to this, has construct

validity been secured in that the informants have been provided the opportunity to review the transcript and drafts in order to secure that this is in accordance with what was addressed in the interview. I also had frequent meetings with my supervisor where the case/interview findings were discussed.

Because the informants also as mentioned had detailed knowledge with regards to issues in the other link, it was possible to address issues that were not only connected to their specific case. This thus helped to confirm and validate some of the findings that been discovered earlier. An example of this is that the informant at Ulstein Group also possessed knowledge with regards to the other links due to Ulstein involvement with the oil companies and because of Ulstein Group's involvement in the entire value chain. This thus helps to strengthen the validity. It was also secured in that it in the cases was clear from which informant the information had been provided and which of the tender documents that had been applied in that specific case.

The internal validity has not been considered since it is according to Yin (1994) only relevant for explanatory case studies that attempt to determine a causal relationship. With regards to the external validity, which deals with whether it is possible to generalize the findings in the study or not, we have that the findings in this study are not possible to generalize to represent the whole population which in this case consist all the companies in the maritime cluster. This thus represent a weakness in relation to the study and one must thus in order to confirm the findings conduct a quantitative study where the findings are possible to generalize to the whole population. This study therefore serves as a background providing an understanding of the basic concepts that can serve as a basis for such a study.

Reliability deals with that someone should be able to follow the same procedure if the study was conducted all over again. This was secured in that a case study database was created. This implies that all the files, tender documents, specifications, notes and transcriptions was kept separated in each different case by creating a separate folder where all the information that was relevant to this case was stored and organized in order to make it easy to follow the same procedure and understand the findings in the study.

## 5.0 EMPIRICAL FINDINGS

### 5.1 *Case 1 - Equipment Supplier*

#### 5.1.1 Process

How the process is set out in this link depends on several factors. First of all will it depend on whether the equipment needs to be shaped according to the vessels or that if it has other implication in terms of how the vessel is designed. Examples of equipment like this are for instance the machinery, main propeller etc. Thrusters however as the case is with Brunvoll are however rather standardized equipment that quite easily fits in compared to other equipment. If this is the case that the equipment needs to be shaped accordingly to the design of the vessel, it is then important that the equipment suppliers are engaged early in the process in order to make sure that the equipment fits in accordance with the design of the vessel.

Another factor that impacts how the process is set out is the customers and their relationship with the company. For instance with regards to customers from the Møre and Romsdal maritime cluster and the additional actors in the cluster there exists a relationship that is characterized by a great deal of mutual trust. The actors in other words trust each other which imply that it sometimes is just enough to make a simple telephone call to the company when equipment is needed. The company then knows what the customer needs and the customer knows what the customer will get. The parties trust each other in such a way that eventual problem that might arise later will be handled by the equipment supplier together with the shipyard.

The process will also depend on the size of the customers. If the customer is a big organization that is listed on the stock exchange the need for more formal processes are required. The reason for this is that these organizations then needs to answer to shareholder and other interest groups. Family owned organizations like Brunvoll can however to a larger extent freely decide how the process should be set out. The process will also be different if several vessels in a series are built. The terms in the contract will then already have been negotiated and it is just then for the customer to tick the “repeat button” in order to place its order when more equipment is needed. This is in other words in accordance with the straight rebuy situation as mentioned in the literature in which only the ordering

function in the purchasing process is carried out. It might for instance be the case that the shipyard has an option in the contract that can be exercised within a certain time limit and we will then have such a situation in which the terms already have been negotiated.

The usual process when the shipping companies are interested in acquiring a vessel is that they approach the shipyards that either are connected to a certain design office or that the shipyard has its own designers through a design office being part of the consolidation like the case is with Ulstein Group. Another possibility is that the shipping companies go directly to a design office in order to discuss different possible solutions. The design office will then in the next part approach the brokers that eventually address the shipyards. There are however several ways in which the shipping companies can acquire their vessels and we will come back to this in detail in the next case.

The important part from this is however that the shipyards after this step will make a request to the equipment suppliers. It is however possible that the shipping companies address the equipment suppliers directly. This might be the case when time is of the essence and the shipping companies are engaged in negotiations with several shipyards. In order to ensure that the equipment supplier can start the production the shipping company will then address the equipment supplier directly. In the building program this will then be an owner-supply that is included in the contract between the shipyard and shipping company. It might also be the case that the shipping companies want to secure that sufficient amount of time is in place and thus therefore sign a side agreement with the equipment suppliers that is eventually transferred to the shipyards with the terms that have been agreed upon by the equipment supplier and shipyard. The most usual situation is however for the shipping company to address the shipyards that will eventually address the equipment suppliers.

When the shipyard approaches the equipment supplier, it will then make a request including the relevant specifications. An example of such a request and the corresponding specifications can be found in the appendix. The specifications are an extract from the vessel's specification and thus only the relevant chapter for the equipment supplier is provided to his side. In Brunvoll situation the relevant chapter which is chapter 4 in the yard specification that deals with the manoeuvring machinery and equipment. In addition to the chapter 4, chapter 1 is also provided that states the more general requirements in

terms material, certification and environmental conditions that needs to be satisfied. The specifications in the chapter that is relevant for the equipment supplier states the requirements that must be fulfilled e.g. that the input power needs to be 1500 kW and the diameter of the propeller needs to be 2400 mm. It can thus be seen that the specifications that are provided to the supplier are in accordance with the purchase order specification as mentioned in the literature. Some of the terms are however negotiated in the next step.

In the agreement that is agreed upon between the shipping company and the shipyard a so-called maker's list is included that is related to the most important equipment in connection with the vessel e.g like thruster, different motor types etc. In each equipment category there are typically included 3-4 supplier that are considered viable candidates for the job. The shipping companies and shipyards will then state their respective preferences in terms of this. If this agreement then is signed with any further considerations, it will then be up to the shipyards to decide the equipment supplier. The shipping company will however have the final word with regards to this and thus have to approve the equipment suppliers that have been chosen.

The shipping company also will have its preferences in terms of this and in this relation might the ship-owner demand equipment from one specific supplier e.g that he demands that the thrusters are acquired from Brunvoll and that they would prefer this. In order for this to be possible the ship-owner must then trade this against something else or pay the extra if this is required in order to get the specific supplier. The informant has experienced that this have been the case in some situation where the ship-owner pays the extra in order to get thrusters specifically from Brunvoll. The shipyards then sends a request (RFQ - request for quotation) to the 3-4 equipment suppliers that constitute the maker's list within each equipment category. The companies that constitute the list are companies that the shipyards know are capable of doing the required job. It is thus seen that previous experience and its relation with the shipyard are important. The maker's list is in accordance to drawing up the bidder's list which as mentioned is an important part of the supplier selection stage in the purchasing process.

After the equipment supplier receives the request from the shipyard he will then respond to this request before he eventually awaits response from the shipyard. If the equipment supplier is then selected to do the required job the parties will then in the next part engage

in negotiations where they negotiate the terms and the final price. When this stage is over the shipyard will place their order and receive an order confirmation from the equipment supplier. The equipment is then finally handed over to the shipyard and the equipment supplier sends personnel in order to make sure everything fits accordingly and in order to handle any eventual problems.

### **5.1.2 Price vs Quality**

With regards to how price and quality is balanced and weighted when evaluating the different bids that have been received from the equipment suppliers, it should be noted that the market is established and that the different actors know the market and the different quality levels in which the different actors are situated. When the shipyard in other words addresses the different equipment suppliers, it knows what quality the different actors are capable of providing. If for instance Brunvoll experiences that the shipyard considers the actors that are perceived to be amongst the cheapest suppliers, then this will make Brunvoll lose their interest and this will be communicated to the shipyard since it knows it is not able to match the cheapest suppliers in terms of price.

When the shipyards acquire the equipment from the cheapest suppliers, this however involves a certain element of risk. The reason for this is that shipyard is not aware of the level of support that is received after the purchase. Technical support after the purchase can be related to shortcomings and defects and this can be very important after the purchase. Quality in this link is related to the quality of the mechanical product that implies that it actually work like it is intended and doesn't fail in addition to the quality of the service that is provided. Quality is thus a total concept in which several dimensions should be considered as mentioned in the literature part of this thesis. When the actors base their decision it is thus a total cost of ownership perspective that is adapted. A product might be cheap in terms of the price that is paid but might be expensive if one considers the costs that occur over the entire lifetime of the product, in other words the lifecycle costs of the product. This is in accordance with what was addressed by Takeuchi & Quelch (1983) and Ellram & Siferd (1993) that was addressed in the literature part.

In this relation, it is however important to note that the ship-owners as mentioned also should have a saying with regards to the equipment supplier that is selected. In this



relation, has for instance the informant experienced that many of the ship-owners are not interested in acquiring equipment from Chinese suppliers due to the fact that they know that the quality is poor, both in terms of physical product and the service that is provided after the purchase. The ship-owners thus have a considerable amount of influence on this process which is related to that there might be much at stake after the purchase in terms of follow up and technical support that is crucial from their perspective. The evaluation process in this link because of what has been mentioned deals with balancing the numerical price of the product with the total lifecycle costs of the product when considering the different actors. The market is also established so the different actors know what quality will be provided when addressing the different actors. If for instance a shipyard chooses to address Brunvoll it is because the company knows it will get a top quality product with life-time support.

### **5.1.3 Quality incentives**

The quality incentive problems that was addressed in the literature part is handled by using different measures. The ex-ante problem in that the company only attracts weaker bidders is to a large extent avoided by the pre-qualification stage in which the maker's list is created. The bidders which are on this list are the only ones who will be allowed to provide an offer to the shipyard. When preselecting which companies that are allowed to provide an offer to the company, the actors will as mentioned know what quality level the equipment supplier is able to provide the company. This ex-ante problem where the auction might only attract weaker bidders is thus not the case here like in the public tendering cases where an open tender procedure is followed. In an open tender situation all companies are allowed to place their bid according to the tender procedure and if the evaluation criteria are solely based on price then this can as mentioned be a problem.

The ex-post problem in which quality is deterred after the contract has been signed can however be a problem. This is handled by using different measures. First of all are relations and the equipment suppliers' previous experiences with the shipyards important when the shipyard and the shipping companies decide the maker's list. The market is as mentioned rather established and especially the relationships between the actors are characterized by a high degree of mutual trust. That this is the case will help avoid opportunistic behavior taking place as was mentioned in the literature and it is also clear

that an equipment supplier with a bad reputation in terms of the quality it has provided in its previous relation with the company will be excluded from future maker's list. This will help discipline the equipment supplier in terms of providing the quality that the contracting parties have agreed upon. In this it also lies that it is possible for the equipment suppliers to signal quality by developing strong brands. This is especially true for new actors that haven't been engaged in any previous relationship with the shipyard. By attempting to signal quality will increase their opportunity in term of being on the maker's list. For a new actor to build a brand will however take time and can be demanding in terms of the resources that are required.

This ex-post problem is however also avoided by introducing options in to the contract. The shipyard can as mentioned have introduced an option into the contract that gives it the right to acquire more of the same equipment with the terms that have been negotiated by the two parties. The shipyard can then exercise this option within a certain time limit. The option will as mentioned help discipline the equipment supplier in that if the shipyard is not satisfied with the quality of the product or the service that is provided it can avoid exercising the option. The option in other words introduces a "threat effect" that helps discipline the equipment supplier as was discussed in the literature part.

#### **5.1.4 Quality**

The most important thing in relation to quality is that it must be adapted to the different customers' needs. Quality in this link is related to both the quality of the mechanical product and quality of the service that is provided to the customer after the purchase. The quality of the mechanical product is related to that the product actually functions properly and that it doesn't fail. The informant exemplifies this with a fisherman where the thruster on his vessel stops functioning properly. When this is the case, the fisherman might lose his entire catch something that might imply great economic consequences from his perspective. The same would however also be the case for a shipping company that provides offshore marine services to the oil companies. If the thruster fails this will imply a loss in terms of income and/or increased costs. The shipping company would then have to possibly rent expensive replacement tonnage in addition to the costs that are required in order to fix the thruster. It in another word impacts the technical availability rate of the vessels and impacts the company's records in terms of this.

It is also closely connected to safety in that such a failure in relation to the thruster or any other equipment could lead to a severe accident where people are injured or where one experience emissions from the vessel. This thus impacts the shipping companies track records in terms of this, which we will see later in the next cases is important for the oil companies. From what has been mentioned it can be seen that quality in terms of the mechanical product implies that the product functions properly and that the company experiences no defects. It can also be seen that this is in accordance with what was mentioned in the literature part. The mechanical product and the quality of this, is however also closely related to the aftermarket services as addressed by Takeuchi & Quelch (1983). A poor product in terms of quality will as mentioned be reflected in that the demand for aftermarket services will increase in the later stages and this can be seen from this case.

Another additional factor in relation quality is however the quality of the service that is provided to the customer. In relation to this are the technical support and additional aftermarket services important. This support will be important in relation to eventual defects, errors and scheduled repairs. In addition to this is it important that the equipment suppliers have spare parts available in stock. The reason for this is that the shipping companies are interested in correcting the defects or conduct the repairs as fast as possible in order to have the vessel available for operations again. When the vessels are out of operations, then this can as mentioned imply as loss in terms of income or an additional cost for the ship-owner since it possibly have to rent costly replacement tonnage. In other words the longer the company has to wait until the vessel is back on the sea, the more inconvenient it is for the ship-owners. When this is the case the company's track record in terms of this will also possibly be impacted something which can impact the outcome of future tenders that the company is involved in.

The technical support and aftermarket part is something that Brunvoll is supreme in term of compared to many of their competitors, both the many of their Norwegian competitors and most of their global competitors. The company has all the necessary expertise in-house that knows the product and the organization well. By having only one product line the engineers are specialized on this and they thus know the product outside in. In addition to this, has Brunvoll all the necessary spare parts in-stock. This is costly but impacts the service that it provided to the customer in that it help shorten the time the customer has to

wait until the vessels is back in operations. This factors that are mentioned are also strengthened by a strong brand name that helps to signal this quality.

What can be seen from what has been mentioned is that quality in this link can be defined as a total concept where quality is to both the quality of mechanical product in addition to the quality of aftermarket services that is provided to the customer. This is in accordance with what was mentioned in the literature part where quality is both related to product in which it is related to the amount of product failures and defects in addition to the services that is connected to the expectations of the customers and the deviations from this ex-post. It is in another words part of a total concept where not only the price matters but where also the total lifecycle costs and lifetime support in relation to the product matter.

An additional factor in relation to quality is the various environmental factors. This is amongst others related to different environmental factors in relation to the mechanical product. First of all is it important that for instance the wires and cables related to the product are of the correct material such that in the event of a fire or great heat the cables and wires don't give off any hazardous, toxic substances. In addition to this it might be that the equipment must be asbestos free and/or that the oil that is used in the product needs to be biologically dissolvable, in other words an environmentally acceptable lubricant. This is especially required when the vessels operates in US waters.

It might also be that the certain factors needs to be documented through a green passport where one declare that certain materials are not included in the product or how great the share of this material the product consists of. In addition to this are the different factors that impact the working environment important, which also is a part of the HSE-term. In this relation is it important the equipment satisfies the different noise requirements that are stated by the company. In relation to thruster this is an important part since the level of noise can directly impact the working environment in that it impacts the crew members' ability to rest. If there is too much noise then this will possibly make the crew unrested which in the next turn might lead to dangerous situations and impact the on board safety.

In addition to what has been mentioned, there are also additional factors that are important. It is first of all important that the suppliers are able to deliver the equipment on time. If this is not done, the completion of the vessel will not be finished on time which in the next turn

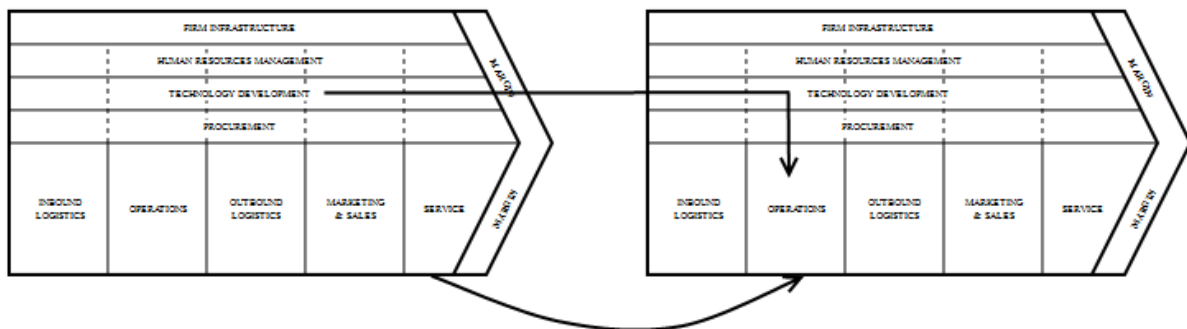
might result in that the shipyard will not be able to deliver the vessel to its customer on time according to the contracted delivery time. When the vessel is delayed, then this might be costly for the ship-owner in terms that it might be necessary from his side to rent expensive replacement tonnage in order to be able to fulfill the contract. In addition to this can factors such as branding and renommé. These factors help to signal quality and thus elevating the other factors such as the product quality and quality of the aftermarket services. Quality is as mentioned in the literature not only related to the actual quality, but also how the customer perceives this quality. The perceived quality in terms of services is as mentioned a result of the comparison between the customers' expectation and what the customer perceives. Such as efforts as branding and building renommé will thus impact the customer's expectation.

### **5.1.5 Quality and competitive advantage**

Quality as mentioned in this link consists of both the quality in term of the mechanical product and quality in terms of the services that are provided to the customer. When considering how the abovementioned factors impact the equipment supplier in the cluster's ability to tackle global competition, one thus has to look at quality as a total concept like it was addressed above. In terms of the quality of the mechanical product the difference between the Norwegian equipment suppliers and the abroad actors might be a significant factor. Some of the Asian competitors might provide a product where the quality of the mechanical product is inferior to their European competitors. Like the case is with Brunvoll selling thruster the requirements in the specifications might be to provide a thruster that provide an input power of 1000 kW. This might be provided with a totally different quality in terms of the mechanical product amongst the different actors.

The Asian competitors might sell their equipment at a considerably lower price. This however as mentioned implies a risk for the shipyard and ship-owner in terms of the technical support that is provided after the purchase. Quality should thus be seen as total concept where the quality of the service that is provided after the service also matter. Even though the Asian competitors might seller their equipment at a considerably cheaper price, the equipment suppliers in the cluster can actually be cheaper if one considers all the costs that occur during the entire lifetime of the product such as repairs, maintenance, spare parts etc.

The informant exemplifies this with a situation where something might be missing or broken in relation to the product after the purchase. For many of the actors in the cluster this is easily solved in which the spare parts are available in-stock. This is however not possible when dealing with the Asian competitors since no such inventory of spare parts exists. This part then has to be brought in by plane something that takes time. The time the vessels is out of operation might as mentioned be crucial from the ship-owner perspective in that the time the vessel is out of operation the ship-owner might experience a loss in terms of income and/or increased costs in that the costly replacement tonnage must be rented. This is an example of such costs the ship-owner and shipyards should take into consideration when acquiring equipment from the actors operating in the cheaper segment where the quality in terms of the mechanical product and the service that is provided is inferior to the actors that operate in the high quality segment.



**Figure 25 - The interlinks between equipment supplier's value chain and the ship owner's value chain. Adapted from Porter (1985).**

In the literature we as mentioned addressed how one should consider the interlinks between a company's value chain and a customer's value chain in order to explain how a company has differentiated from its competitors. In our situation it can be seen that is the interlinks between the equipment suppliers' service activity and the shipowner's operations that partly helps explain the actors ability to tackle global competition. This is as mentioned related to that the ship-owners know that after the purchase the equipment suppliers in the cluster have a better technical support and aftermarket services after the purchase. This will impact his value chain in that the time the vessel is out of operation will be reduced something that in the next turn will help save costs and reduce the loss of income from his perspective.

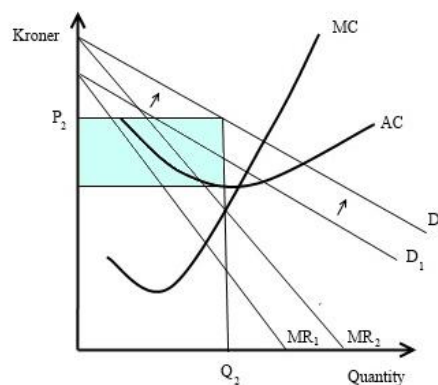
In relation to this the companies in the cluster also have an advantage in terms of that they are closer to the ship owners and their operations. This imply in others words that for a shipping company operating in the northern sea it would take more time and thereby be more inconvenient in order to go abroad to fix a problem in relation to the equipment. The companies in the cluster are situated closer and thus simplify this process. It should as be taken into consideration that the actors in the cluster have developed a good relationship where the actors trust each other. That this is case also help give the actors an advantage in terms of that the customer know what they will get and that the equipment suppliers know the needs of their customers.

The advantage is however also linked to the interlinks between the technology development activites in the two value chains that again impact the ship-owner's operation activity. The technological development activity in this case is related to the development of new solutions in relation to the equipment. The companies in the cluster here have an advantage in terms of that they are closer to the problem. The reason for this is that the cluster as mentioned is represented by all the respective parties in the supply chain, both equipment suppliers, design offices, shipyards and the shipping companies. Since most of the shipping companies are situated here, then this help give the equipment suppliers access to the relevant problems that the shipping companies and the additional parties experiences. This access gives them an advantage when developing new solutions in that they know the shipping companies' needs and the relevant problems. That the other actors are present here also help when considering the integration of the different solution something which is simplified when all actors are present in the cluster and help share relevant knowledge. This advantage is in other words directly related to the cluster effect that the actors experience.

It is the combination of these factors that together impacts the equipment supplier in the cluster's ability to cope with foreign competition. In addition to this is branding important in that it help signal quality. It is as mentioned in the literature important what the customer actually perceives and not only the actual difference in terms of the mechanical product and the service that is provide. Branding and imaging help the customer to perceive this difference and thus allows the company to charge a premium. There are many

of the actors in the cluster that have managed to build a strong brand name such as Brunvoll, Rolls-Royce etc.

It is altogether these factors that have made the actors able to face the competition from many of their global competitors. The abovementioned factors together help shift the demand curve upward allowing the companies to exert a profit. It however as mentioned expected that the competitors will follow and attempt to imitate the success factors of the equipment suppliers in the cluster. The mechanical product and the service that is provided can be fairly easy to imitate. The cluster effect and branding is however more difficult to imitate in that it takes time to build a strong time and to develop a complete cluster where the actors are present sharing knowledge and integrating solution in close cooperation with the other actors.



**Figure 26 - The abovementioned factors impact on the equipment supplier in the cluster's profit. Figure adapted from Waldman & Jensen (2013) p. 431**

## **5.2 Case 2 - Shipyard**

### **5.2.1 Process**

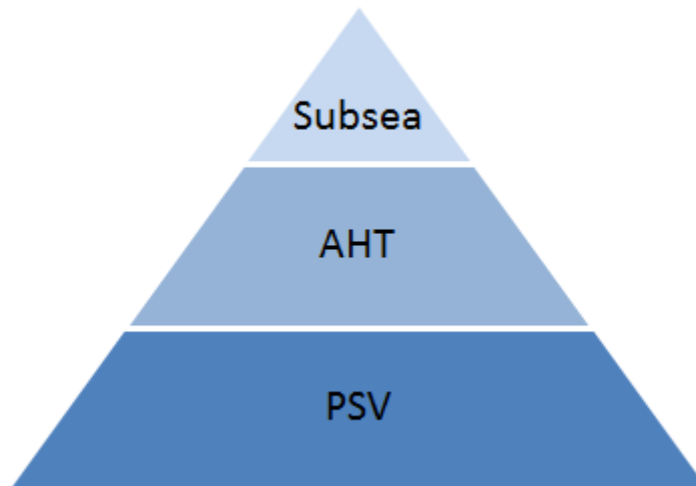
There are several ways in which the shipping companies can acquire their vessels, and we will in the following attempt to address all the possible ways in which this can be done. One way in which this can be done is that the shipyards might contract the vessels on their own behalf without having a specific buyer at that time. The vessel is then after it is finished sold to an investment company in the consolidation where the risk is transferred. The shipyard and the owners have then prior to the completion of the vessels set up this



investment structure. An example of this is Ulstein Group where the vessels after their completion are transferred to an investment company, Blue Ship Invest.

When this is the case, the vessels are thus in reality contracted on the shipyard's own account and risk since it doesn't necessarily have a buyer at that time the vessel is contracted (except from the investment company that as mentioned is a part of the consolidation). It is however important from the shipyard's side to analyze the market prior to the vessel is contracted in order to predict the market developments and the possibilities in relation to reselling the vessel in the future to one of the shipping companies. It is seen that when this is the situation we in fact have ordinary auction where the shipyard (the auctioneer) is interested to sell the vessel to many buyers as represented by the shipping companies (bidders). This is in contrast to the ordinary situation where we have a procurement auction where on buyer (the auctioneer) is interested in procuring from several suppliers (bidders).

The vessels that are sold in this way are typical standardized platform supply vessels that belong to the lower class of the quality pyramid. These vessels, as mentioned in the industry part, are rather standardized compared to the more complex subsea vessels that belong to the upper class of the quality pyramid. The subsea vessels and the other vessels that belong to the upper class of the pyramid are thus better suited for tailoring than the more standardized vessels that can be contracted on the shipyards own account and risk. As seen from the industry part, are most of the vessels that are contract in the cluster so-called upper class vessels. Contracting vessels belonging to the lower class on one's own account and risk thus represent a market niche that is exploited by some of the actors. Since these vessels are more standardized, brokers are typically not involved.



**Figure 27 - The quality pyramid and different levels**

The reason that this is a profitable way of selling the vessels is related to three different factors. First of all have the shipyards after the financial crisis received less money throughout the entire building process of the vessel. The shipyards have in addition to this been forced to contribute more on the equity side in connection with financing the vessels. A third factor is that the taking over guarantee has been reduced, which is related to the shipping companies guarantee that they will take over the vessels once it is finished. That this is now reduced implies that the shipping companies can choose up to the point of delivery whether the shipping company actually wants to purchase the vessel. It is in other words possible for the shipping companies to cancel the deal all the way up to the point of delivery. These factors together contribute to that the shipping companies in reality have an option to buy the vessel. The question is then if the shipping companies actually buy the vessel or if they in reality buy an option to buy the vessel. These factors altogether contribute to that the risk of contracting vessels on the shipyard's own account and risk is not that much greater than selling vessels according to specs.

Another way in which the shipping companies can acquire their vessels is if the shipping companies develop specification and address the shipyard that will design a vessel, either through that the shipyard is connected to a specific design office or that it has its own designers as a part of the consolidation like for instance the case is with Ulstein Group. Another possibility is that the ship-owners when developing the specification addresses a design office and that they in close cooperation develop the specification of the vessel. The parties will after this address the brokers that in the next stage address the different

shipyard and run a tender. The broker can in this connection exert a great deal of influence in relation to complex projects where vessels are built according to specifications. They have an in-between role where they according to the informants manage to achieve good margins by taking very little risk. According to the informant they are focused on the transaction and have no relation to product development and long term thinking. When the brokers are involved they engage in hard bargaining where the shipyards are pressured towards lowering their prices.

It might also be the case that the vessel is a new build that is tailored to the oil company's specific needs and that will be engaged on a long term contract. This new build vessel is then a part of the tender (part of the shipping companies bid in this tender) between the oil company and the shipping company. It can thus be seen when this is the case that the shipping company has already addressed the shipyard on the basis of the requirements and specifications developed by the oil company as a part of the tender that has been issued. In this connection then we might for instance have Eidesvik and Subsea 7 competing with Ulstein quality and DOF competing with Vard quality in the tender. It should thus also in this connection be mentioned that it is possible for the shipping company to also address the contractor and together with it develop the vessel specifications.

What can be seen from this is that most of these procedures involve that specifications are developed, either it is in connection with a design office, the oil company or the contractor. The shipyard in the next stage receives a request (request for quotation or request for tender) from either the shipping company or the broker. The shipyards then respond to this and if it is chosen they might in the next stage be engaged in negotiations together with the brokers/shipping company, if this is the case, with regards to the final price and terms. It is typically the vessels that belong to the upper class of the quality pyramid that are acquired using the above mentioned procedures where the vessel specifications are developed. These vessels are as mentioned more complex vessels that are tailored to the customer's specific needs.

In connection to the cases where the vessels are built according to specifications, whether it is in cooperation between the shipping company and designers, contractors etc., and where the shipyards are addressed isn't the process where the bidder's list are drawn up a rationale process. The reason for this is that the different actors have their preferences in

terms of the shipyards and design offices that should be selected during this process. It is in other words a process that is emotional based and where the previous relations between the different actors matter a lot. It is however also a difference between the different actors where some of them have adapted a more analytical approach than compared to their competitors.

### **5.2.2 Price vs Quality**

Locally the actors however have preference of who they cooperate with that is based on the previous interactions and trust that have developed between the involved parties as a consequences of the previous interactions. That this is the case also has implications in terms of how price and quality is balance and how this is communicated to the different bidders. The shipping companies communicate their quality demands in advance and the shipyard knows through its previous interactions with the different shipping companies which of the different actors that demand top notch quality.

With regards to price and quality and how this is weighted, this has led to a development where it is important for the shipyards to engage in paid activities in relation to the oil companies and the contractors. The reason for this is that it is the oil companies and contractors that in many ways dictate what is important for the different actors to focus on in terms of quality and how they appreciate this. When considering, as we will see in the next case, that the oil companies do not communicate their priorities in terms of quality versus price and how the different factors are weighted, then this underlines the importance of developing relations with the oil companies in order to understand their preferences. That this is the case has thus led to the situation where some of the shipyards like Ulstein are approaching the oil companies in terms of engaging in paid activities in relation them.

This situation has put pressure on the shipping companies that are forced to develop into providing services that belong to the upper class of the quality pyramid e.g like well intervention and subsea operations. An example this is Island Offshore that provide a wide range of services to the oil companies. The shipping companies that operate in the lower class of the quality pyramid providing tonnage can thus experience increased competition. The shipyards can as mentioned contract standardized vessels on their own account and

risk and transfer this vessel to an investment company that is designed for this purpose. These vessels that are contracted this way and do not have a buyer when it is finished can be used in order to execute paid operations in relations to the oil companies. When this is the situation, this will help to develop relation with the oil companies and gaining knowledge in terms of the oil companies' priorities and how price and quality is weighted. The knowledge that is gained with regards to this can be exploited when also contracting vessels that belong to the upper class of the quality pyramid.

### **5.2.3 Quality incentives**

The quality incentive problems are also in this link handled by using different measures. The ex-ante problem in which the tender only attracts the weaker bidders is to a large extent avoided also in this link through the pre-qualification stage where one have to be put on the bidder's list in order to be able to provide an offer to the company. The shipping companies thus have the opportunity to select the bidders that they perceive satisfy their quality preferences something which is no problem for the shipping companies since the actors that are allowed to provide an offer to them have been engaged in previous projects with the shipping company and thus have developed a close relationship. The market is in other words fairly established and the different actors know the needs of the actors and where they are situated on the quality pyramid. This problem is also dealt with in that many of the shipyards can signal quality through developing strong brands. Many of the actors in the cluster like Ulstein, Vard etc. have managed to develop such a strong brand.

The ex-post incentive problem however in which the quality is deterred after the contract has been signed in order to exert short term profit is however a valid problem that is dealt with using various measures. This is first of all avoided in that the different actors have developed a close relationship something which is closely related to the reputation factor as addressed in the literature. If one of the decides to behave opportunistically by deterring quality ex-post and providing a vessel where quality of the vessel is poor or it is not able to deliver the vessel on time for instance the shipping company is then likely to exclude this actors from future tenders. It is also likely that other shipping companies will take the shipping company's experience in relation to this actor in to consideration when considering different actors in future tender situations. This will in other words damage the actor's relationship with the shipping company in addition to its reputation in connection

with other actors. When the actors have developed a relationship that is characterized by that the different parties trust each other, then this will to a greater extent be avoided as was addressed in the literature part.

This problem is however also avoided in that the shipping company introduces an option into the contract which also was addressed in the literature. This option might for instance imply that the shipping company has the right to acquire additional vessels of the same design at the same terms in the future. The shipping company is however not obliged to exert this option and the company thus has the opportunity to avoid exerting the option if it experiences that quality has been deterred ex-post. The shipyard then knows that if it deters quality then the shipping company is likely to avoid exerting the option something which in the next turn imply a loss seen from the shipyard's perspective. The option will in other word introduce what was referred to in the literature as a "threat effect" that helps to discipline the shipyards in term of providing a satisfactory quality level. Together these two measures that are presented help ensure that the future gains are greater than the short term profits gained by quality deterrence.

#### **5.2.4 Quality**

Quality in this link should also be seen from a total perspective where several dimension are important as addressed in the literature. What first of all is important, is that the shipyard manages deliver the vessel on-time according to what has been agreed upon in the contract. It is however not only sufficient to satisfy this since the shipyards also need to be able to prove this through documenting on-time delivery of previous projects. In other words is it important that the shipyards have a track record in terms of this that can be documented and provided to the shipping companies prior to the purchase. This factor can thus be a decisive factor in terms of who wins the tender.

The reason for this is clear that if the shipyard is not able to deliver the vessels on-time to the shipping company then this might be a costly affair. If this is the case and the vessel is delayed, the shipping companies might have to rent expensive replacement tonnage in order to be able to manage its current operations. In addition to this, can the contract in a worst case scenario be cancelled which might in the next turn result in that the shipping company loses its financing since the requirement for this was a valid contract. That the

vessel is delayed might also impact the shipping company's technical availability rate and its track record in terms of this and this is a factor that can be decisive in a tender in relation to the oil companies.

Other important dimensions in relation to quality are connected to operability and safety, which are two factors that are closely connected. The informants exemplifies this with a program or system in connection with their vessels that is called Operation +. This system or program secures that even though one component fails, the rest of the system will still be able to function properly and the operation can be continued until it has been ended. The regulations, in accordance with this, demand that the operation is stopped immediately, when this is the case that one of the components fails.

This program or system however secures that the operation can be ended in a safe way and thus represent an extra safety vent (redundancy). The program in other words implies an extension of the existing regulations and help secure that the losses that the shipping companies incur because of such a potential situation are reduced. This program or system is one such example where operability and safety is secured and where the importance of this is highlighted. It is however also in addition to this important that company provides certification that show that these safety measures such as the Operation + program are in accordance with established standards. The classification societies, as mentioned in the industry part, play a central role in terms of establishing these standards and provide certification after thorough testing and inspections.

Safety is however related to additional factors and might in addition to what has been mentioned be related to how capable the vessel is in terms of operating under different conditions on sea. That the vessel is able to operate under rough conditions might impact the crew's ability to rest which in the next turn imply fewer incidents and accidents. That there are fewer incidents help the shipping companies to maintain their track record in terms of this, which we will see in the next cases, is important in relation to the oil companies. How capable the vessel is in terms of operating under different weather conditions can to a large extent be related to the design of the vessels and the functionalities in relation to the vessel.

An example of this is the Ulstein development of the so-called X-bow, which is a design concept related to hull of vessel. This inverted shaped hull helps to exactly ensure that safety is secured in that the noise level is reduced through the vessel experiencing a softer entry into the waves. The crew is thus to a greater extent able to rest since the comfort has been improved which in the next turn eventually helps to improve the safety. Safety can however also be related to the working environment in the shipyard, which is a part of the HSE-term. That the working environment is safe implies that it is safe for the workers to work in the shipyard and that the shipping company safely can send their employees to the shipyard.

The design and functionalities in relation to the vessels is also related to the operational efficiency and how this can be improved which is closely related to what has been mentioned above. When adapting new innovative designs and functionalities that improve the safety like for instance the X-bow, then this can also contribute to improving the operational efficiency. It might for instance be that the vessel because of the design saves fuel costs that eventually improve the operational efficiency. It can in addition to this, be related to that the vessel is able to operate more efficiently and save time when going offshore to onshore and back to the platform. Functionalities and properties in relation to the vessel are also related to such as the onboard equipment and the onboard logistics such as the cranes, winches and other equipment that can handle heavy lifting. The importance of the equipment suppliers and design offices cooperating in close relationship with the shipyards in order to develop new solutions that either improve the safety, operability, operational efficiency and/or onboard logistics is thus again underlined as seen in the previous case.

One additional factor in relation to quality in this link is also the services that are provided after the purchase of the vessel. This can concern aftermarket services such as repairs, upgrades and spare parts. As was mentioned in the previous case, is it important for the shipping companies that aftermarket services are provided that help ensure that the vessel is ready for operations again as fast as possible since this amongst other has implications for the technical availability rate and the track records in terms of this in addition to the costs that might arise when the vessels is out of operations such as rent of replacement tonnage.



It is important that the aftermarket services are provided in close cooperation with the equipment suppliers since they have the required expertise in relation to their product such as Brunvoll has the necessary in-house expertise in relation to their product. It is thus necessary to involve the equipment suppliers in relation to relevant problems connected to their product even though the warranty that exists is between the shipyards and the shipping companies. In addition to aftermarket services, are also measures such as branding, trademarks etc important dimensions in terms of quality. These measures as mentioned help to signal quality. It is as mentioned in the literature not only enough to provide quality in terms of extra functionality and smart design if the customer is not aware of this and how this has implications from his perspective. Branding, trademarks and additional marketing measure however communicates this to the customer and increases his awareness in terms of this.

From what has been seen for can quality in this link also be defined as a total concept where several dimensions matter as in accordance with what was mentioned in the literature. As we have seen are the functionalities and the design of the vessel important in order to ensure safe and efficient operations. This is in other words connected to certain attributes in connection to the product. We have however also seen that additional dimensions matter such as on-time delivery of the vessel, aftermarket services and branding that help to elevate the functionalities and design in relation to the vessel. When the actors base their decision, one thus considers all these dimensions when acquiring vessels and not only the actual price in relation to the vessel. This is in accordance with the total cost of ownership perspective as mentioned in the literature.

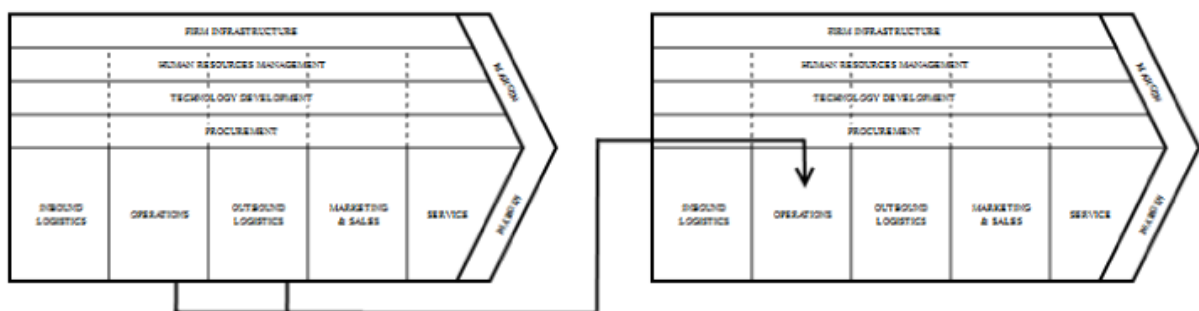
### **5.2.5 Quality and competitive advantage**

In terms of how these quality factors enable the different actors in this link to tackle global competition we should separate between the two situations where the shipyard builds vessels standardized vessels and where the shipyard builds more complex vessels according to specifications that belong to the upper class of the quality pyramid.

When the actor builds standardized vessels that belong to the lower class of the quality pyramid, it is possible for the actor to streamline the involved logistics and thereby be able to a larger extent compete in terms of price. In addition to this, is it not required to all the

time have to reengineer the vessels like the situation would have been if there would have been several immediate buyers e.g for instance ten shipping companies ordering ten different vessels according to their developed specifications and preferences. When this is the case, it is also more predictable for the equipment suppliers that to a larger extent know what to expect and when to expect it. This implies that we in reality have a make-to-stock production system as mentioned in the literature where the vessel in its actual form is built for stock where it is kept until the vessel has a buyer. This thus give the shipyard an advantage in terms of that the lead time, the time it takes until the customer receives the vessel, is shortened. The vessel can be delivered immediately and the risk from the ship-owner's side in terms of that the vessel might be delayed is removed. Issues such as certification and approvals can in addition to this be done prior to the purchase.

We see that when this when this is the situation the shipyards operations and outbound logistics, which implies how the vessels are built and sold to the customer by adapting a make-to-stock production system, impacts the customer procurement activity that eventually impacts their operations. As we have seen does the customer now procure their vessels in that they acquire vessels where the design and additional factors are already pre-determined prior to the purchase. The shipping companies in this situation thus do not develop specification and approach the different shipyards as the case might be when dealing with upper class vessels. This way of acquiring the different vessels is thus more similar to a "normal" auction where the shipyards now are interested in selling the vessels by receiving bids from different shipping companies.



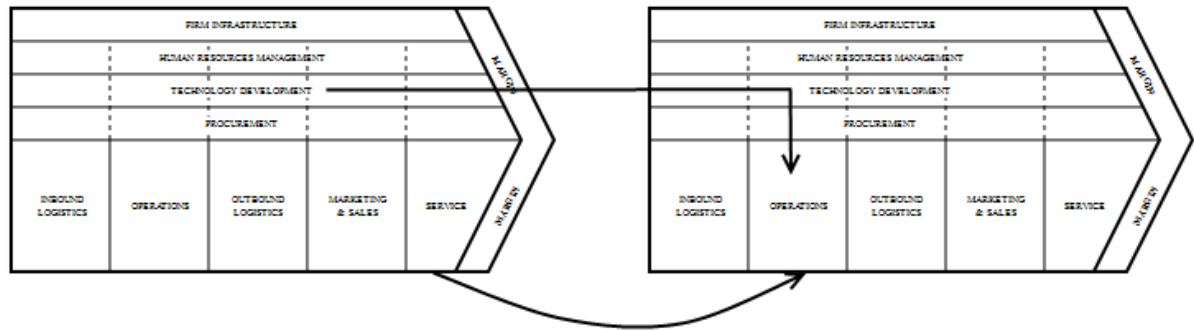
**Figure 28 - The interlinks between the shipyard's value chain and the ship-owner's value chain when providing standardized vessels. Adapted from Porter (1985).**

This way of procuring the vessels has several implications for the shipping companies operations. First of all, will the shipping company experience that the lead time is reduced

which imply that the company to a greater extent will experience on-time deliveries. If the vessel is already built prior to the purchase the customer will experience no lead time and can thus receive the vessel immediately after the purchase. That the vessels is delivered immediately helps to improve the technical availability rate in terms of the vessels in the fleet in addition to it removes the risk of situations where the vessels are not delivered on-time and where the shipping company has to rent expensive replacement tonnage.

It also impacts the shipping companies' operations in that it is possible to standardize the fleet. Fleet standardization as we will see later on in the next case, is related to the operations in that it is possible to switch crew between the different vessels. The crew that is qualified to operate one of their vessels is then in this situation also able to operate most of the other vessels. This also partly impacts the safety in that the vessel is familiar to the crew operating the vessels in the company's fleet. Fleet standardization is also advantageous in terms of the aftermarket services and that it is possible to have spare parts than can be used on all of the company's vessels in their fleet. This can in the next turn help shorten the time the vessel is out of operation which as mentioned several times is advantageous in terms of technical availability and the track record in terms of this in addition to the cost that might occur in the event of this. An additional advantage in term of this way acquiring vessel is that the ship-owners do not have to contribute on the financing side and deal with the risk that is related to it. This advantage is however directly related to the operations in the same way as the other factors as discussed above.

When actors however build vessels according to specifications that belong to the upper class of the quality pyramid, the situation is however different. What will be important then for the shipyards is then to develop new innovative solutions in cooperation with the other parties in the supply chain. The interlink between the shipyard's technology development activity in his value chain and the shipping company's technology development in his respective value chain is thus important. An example of this is the operation + program or system that according to the informants was developed in close cooperation with Island Offshore. When the actors in close cooperation develops new solutions then this impacts the shipping companies operations as discussed earlier in that for instance safe operations are secured, more efficient operation and/or more environmental friendly operations etc.



**Figure 29 - The interlinks between the shipyard's value chain and the ship-owner's value chain when providing vessels according to specification in the upper class of the quality pyramid. Adapted from Porter (1985).**

In relation to this there is however also a difference between the different actors. Actors that are present several places in the value chain like Ulstein Group have an advantage in term of that the company is able to what the informant refers to as “play the value chain”. This implies that the company is able to use its entire expertise within the organization from the design, equipment supplies and to the shipbuilding part. What is important for these organizations that are present in the entire shipbuilding value chain, is that such project related to vessels that belong to the upper class of the quality pyramid are able to involve the entire consolidation.

It is also a difference between the actors that are a part of the cluster and the foreign competitors in relation to this. The reason for this is that the offshore shipping companies that are present in the cluster know the operations well and what is required in terms of operations in relation to the oil companies. This thus represent an advantage when developing new solutions in that the shipping companies can contribute and share their knowledge that has been developed after continuous interactions with the oil companies over time, especially on the norwegian continental shelf. The aftermarket services that are provided to the customer are however also important. The reason for this is as mentioned that it is connected to the shipping companies' operation activity in that it improve the technical availability rate and the records in terms of this in addition to reducing the costs associated to this. It is as mentioned important that this provided in cooperation with the equipment suppliers that have the required expertise in-house in relation to their product.

What can be seen from this is that when building standard vessels in the way that has be described above the actors compete in terms of price, logistics/on-time delivery and

financial terms provided to the company (in other words that the shipping company does not have to contribute in term of financing). Quality in this relation is then to a greater extent related to logistics and on-time delivery than to the actual product and its feature even though this also has some importance. These different factors have made it possible for many of the actors to tackle the global competition especially from their Asian competitors where most of the as mentioned standardized vessels are built.

Quality in relation to more complex vessel in the upper class of the quality pyramid is however to a greater extent related to the vessels and the different solutions and features associated with it in addition to the aftermarket services that are provided. It is these factors that have been mentioned above in addition to branding that help to shift the actors' demand curve upwards allowing the company to exert profit. Imitation will however in the long run lead to that the demand curve shifts downward and it is thus important to continuously develop new solutions in relation to these vessels in the high quality segment. It is however possible for the actors to adapt both strategies in which the standardized vessels are built on the shipyards own account and risk and where the more complex vessels in the upper class are built according to specifications. This gives the actors great flexibility which in the next turn improves their competitiveness.

### ***5.3 Case 3 - Shipping company***

#### **5.3.1 Process**

The process with regards to how the oil companies acquire marine services from the shipping companies can be quite complex and the practice in terms of this might vary from oil company to company. We will however provide some of the most common practices that have been adapted by the different parties. The process with regards to how the oil companies acquire their services from the shipping companies first of all depends on the length of the contract. In terms of shorter spot contracts, typically 1 month or around that time length, the normal practice for the oil companies is to approach the brokers. The brokers will in the next turn address the shipping companies and place their request. The oil companies can in this relation address several brokers or they might address a few exclusive brokers.

The medium to long term contracts however require more formal processes that amongst others require the shipping companies to provide documentation. The process in relation to longer contracts requires more work than the short term spot contracts, and because of this the process typically takes more time. The documentation in this relation is to a great extent related to HSE-measures and the companies' track records in terms of these different measures that are included in the term. In relation to even longer contracts, then this as mentioned in the previous case concerns a new build that is tailored to the specific needs of the oil company. Specifications will as mentioned here be developed and the shipping company in this relation has typically already addressed the shipyard that it is connected to or that it has developed close relations to in order to discuss possible solutions. This shipyard is then as mentioned a part of this tender together with the shipping company.

In order to be able to provide an offer to the oil companies, in other words in order to be on the bidder's list, it is required that the different actors are registered in Achilles, which is a portal where offers are provided. In order to be registered in this portal the shipping companies are however required to provide documentations that ensure that company has quality management systems, environmental management systems and safety management systems. When this has been provided and the documentation has been approved, the company will be registered in Achilles and it is then pre-qualified in terms of participating in international tender process. In other words is the shipping company then when registered here, allowed to provide an offer to all the oil companies that issue a tender through this portal. This is however only the case for medium and longer term contracts since the short term spot contract as mentioned are handled by the brokers.

In the continuation of this process, the different bids that have been provided to the oil company by the shipping companies registered in this portal are then considered and evaluated by the oil company. This stage will eventually lead to a bidder's short list in accordance with what was mentioned in the literature where only the shipping companies that are considered viable candidates are present. In relation to this, can factors such as previous interactions and relation with the shipping company matter. That the shipping company has been engaged in projects earlier in relation with the oil company show that the shipping company to a greater extent is qualified and that they have a proven or performance record in relation to the company that can document this.

The shipping companies that are present on the bidder's short list will in the next stage engage in negotiations with the oil company. In this negotiation stage the final price is on the agenda in addition to the different terms. The oil companies typically in this relation negotiate with several actors in order to attempt to what the informant refer to as "play the market". It can thus be seen that this represent a hybrid form as mentioned in the literature where we first have an auction where the different actors provide their bids that is eventually followed by an negotiation stage where the remaining bidders are engaged in negotiations in terms of the final price and additional terms.

It is then a trade-off from the shipping companies' perspective if they should lower their offer or they should stick to their original offer. In connection to this, can also previous relations with the company represent an advantage in terms of that the actor through its previous relation with the oil company has more information with regard to how the company values its offers and whether the company is satisfied with what has been previously provided. In relation to this stage it is possible that the tender is cancelled and a new tender is issued if the actors are not able to reach an agreement or if the oil company's and/or contractors' conditions change during the process.

### **5.3.2 Price vs Quality**

When concerning price and quality and how these different factors are weighted, this is not communicated to the different parties. The oil companies only communicate the day rates that represent the bottom. The different factors are then added to this day rate and together make-up the effective day rate. The criteria how these factors are weighted and added to make up the effective day rate is however not open and are not communicated to the different actors participating in the tender. The shipping companies must thus guess how the oil companies will appreciate the different factors in their offer. It is for instance not possible for the shipping companies to know how the oil companies perceive an Ulstein designed vessel relative to a Havyard designed vessel.

The same is also the case in terms of new innovative solutions in relation to the vessel that is offered in the tender in terms of that the actors cannot know with certainty how much emphasis the oil companies will put on this when evaluating the different bids. It is thus

however clear that it is not only the price that matters, as we will come closer into when considering quality, in that it is rather a total concept where additional dimensions matter such as safety, efficient operations etc. The actor because of this know that the oil companies consider this when evaluating the bids, but they as mentioned cannot with certainty how much emphasize will be put on this relative to the price.

The actors would however prefer to have as much information as possible with regards to this since it is then to a greater extent possible to know what to emphasize. In this relation, it is then important to attempt to develop as close as possible relations with the oil companies in order to get knowledge with regards to how the company emphasizes the different factors. It is however difficult to develop close relations with the oil companies since they are afraid of illegal inside activities where any of the suppliers are favored. The oil companies because of this are concerned with that the actors get the same information. In order to secure this, the oil companies typically have clarifications meetings prior to the tender where all the actors are allowed to participate and ask questions. The problem in relation to this is however if one of the parties asks too many questions then this party might risk revealing its plans and different approaches to the competitors.

The negotiation stage is also a stage where the different factors can be highlighted and discussed in detail. This however also imply a risk in terms of that if the company reveals too much and it doesn't win the tender then the company's solutions might be used and suggested in relation to the oil company and the competitor winning the tender. In other words, there is a trade-off in this process with regards to if one should risk revealing ones solutions in order to get more knowledge with regards to how the oil company emphasizes the different factors or if one should avoid revealing ones solutions in order to prevent the competitors from stealing its ideas with regards to these solutions.

### **5.3.3 Quality incentives**

With regards to the quality incentive problems we first of all have that the ex-ante problem, in which the tender only attracts the weaker bidders in terms of quality when the company bases its decision solely on price, is handled in this link. The reason for this is that it is clear for the parties that the oil companies base their decision in terms of a total perspective where additional factors are added to the daily rate that represent the bottom.



What is not clear in this process is how much emphasis is put on these additional factors relative to the price. It is also to a great extent avoided in that the bidders are required to be pre-qualified through being registered in the Achilles portal.

In order to be registered in this portal the parties as mentioned are required to provide documentation that the company has a satisfactory quality management systems, environmental management systems and safety management systems. This helps ensure that the weaker bidders in terms of quality are excluded for the further process. The bidders are in other words in accordance to Spencer (1973), which was mentioned in the literature part, screened thoroughly prior to the tender by providing the relevant documentation with regards to these different systems. It is also in a way prevented in that the shipping companies can signal quality which is something that the oil companies can base their decision on when deciding the bidder's short list. Quality can as mentioned be signaled in terms of branding and different marketing measures, which also in accordance to what was mentioned in the literature.

The ex-post problem, in which the actors might deter quality after the purchase, is also handled by using different measures in this link. First of all, it is seen that this problem is avoided in that the oil companies when deciding the bidder's short list might base their decision on shipping companies that they trust and that are able to document an excellent track or performance record in its previous relations with the company. When the company has done previous projects with a satisfactory quality level, the different parties will eventually develop a relationship that is characterized by a high degree of mutual trust and this as mentioned in the literature helps prevent opportunistic behavior. This problem will in other words to a certain extent be avoided when the oil companies select shipping companies that they trust and/or that have been engaged in previous projects with the company. In relation to this, it is also possible to exclude actors with a bad reputation. The informant confirms that it might be the situation that the oil companies might exclude actors based on their own experiences or other actors' experiences. This might for instance be related to a certain shipping company, a nationality or a certain design. This is thus in accordance with what was mentioned in the literature.

This ex-post problem is however also handled by adopting different contract lengths in addition to introducing an option into the contract. The option as mentioned in the

literature introduces a “threat effect” that helps discipline the shipping company in terms of avoiding to deter quality. The option gives the buyer, which in this case is the oil company, the right or the privilege to extend the contract. This is however only a right and the oil company is thus not obliged in terms of extending the contract. The shipping company then knows that if it deters quality then the oil company will punish the shipping company in terms of avoiding exerting the option. It is thus seen that this helps discipline the shipping company in terms of avoiding quality deterrence.

The important in this relation, whether the shipping company decides to deter quality or not, is if as mentioned the short term gains of deterring quality exceeds the future gains. Because of this, it is not enough to introduce an option if the length of the extension is only a short period of time. In order for this to be successful one must therefore consider the length of the extension period. The longer the contract is extended when exercising the option, the greater is in other words the shipping company’s incentives in terms of providing quality. This is as mentioned related to that the future gains will increase more the longer the extension period is which make sure that the future gains exceed the short term gains of deterring quality.

The figure below shows the contract structure of Farstad Shipping, and from this it can be seen that contracts are to a great extent based on options that can be exercised by the oil companies. The picture confirms that longer contracts tend to be supported by options while shorter contracts tend to be term contracts. The reason for this is as mentioned that by providing shorter contracts then this will reduce the short term gains by deterring quality. The contract length can thus be a method in itself in order to avoid quality deterrence. In terms of the longer contract it is however necessary to introduce an option into the contract in order to make sure that the future gains exceed the short term profit of deterring quality. In other words is it necessary to compensate with introducing an option into the contract when dealing with longer contracts since the short term gains of deterring quality are likely to be greater than the future gains of avoiding quality. It is however important to note that options also are used for speculation purposes. The oil company can, when this is the case, exercise the option if the price that is agreed upon in the contract (in other word the option price) is lower than the current market price.

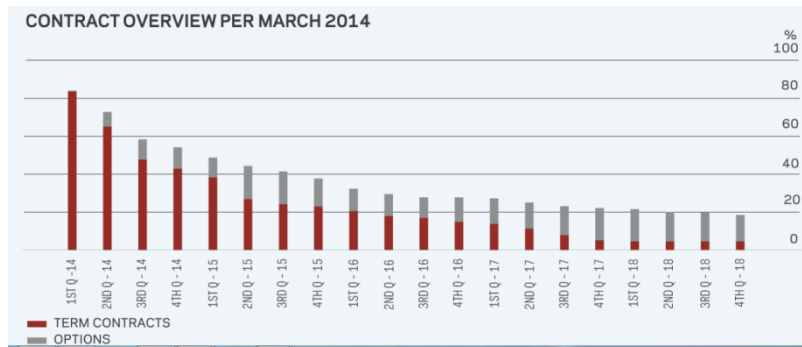


Figure 30 - The contract structure of the Farstad fleet (Farstad.com 2013)

The ex-post problem is in other words dealt with in this link by using the abovementioned measures. Selecting bidders that the oil company trusts and that has a good reputation in the market when deciding the bidder’s short list will as mentioned help prevent this problem. This in combination with varying the contract length in addition to introducing an option into the contract to make sure that incentives are provided to the supplier’s side and that this problem thus to a great extent is handled in this link. It is necessary to introduce these measures since we in this link as mentioned in the literature deal with a service, which has to do with something intangible that can be hard to verify ex-post. Since this is the case in this link, the need to adapt different measures is of great importance here.

### 5.3.4 Quality

What is important for the shipping companies to focus on, and thereby what is also important for the oil companies, was addressed by Bourbon COO, Gaël Bodenes, at the annual NCE Maritime Conference in Ålesund. During this presentation Bodenes proposed four different factors that all play an important part in Bourbon’s long term strategic planning in order to achieve what he referred to as “operational excellence”. The different factors are showed in the figure below. The first important factor is safety, as can be seen from the figure below where it is represents one of the four important pillars in order to achieve operational excellence (Bodenes 2013).

This factor concerns that the number of accidents and incidents are maintained at a low level and that a safe working environment is secured for the onboard crew. This is a part of the HSE-term which the informant also exactly emphasizes is important for the oil companies. It is however important that the shipping company is able to prove this towards

the oil companies and the shipping companies must thus document that they have a track record in terms of this. This helps to prove that shipping company is able to provide operations where the HSE-measures are secured. The shipping companies must provide documentation and statistics in relation to issues such as absence due to illness, accidents and emissions. In the tender documents that can be found in the appendix it is for instance specified that the shipping company in their bid should provide safety statistics for the company and the vessel that is offered over the last 3 years. That this is important is also emphasized in Farstad Shipping's objective statement in which their overall goals is to have zero emissions to the environment, zero injuries and zero damage to equipment (Farstad.com 2013).

In order to achieve this it is important that the shipping companies provide proper training to the crew and that experienced crews are hired (Bodenes 2013). The reason for this is that the more experience and the more training that the crew has received then the less incidents are likely to occur. It is also important to follow up on the employees and applying different measures in order to secure a safe working environment. In addition to this can the fleet be attempted to be standardized when acquiring vessels such that it is possible to switch crew between the different vessels and that the vessels are familiar to the crews.

The equipment suppliers and shipyard play a central role in order to achieve this. First of all, can the actors as mentioned in the previous case develop new solutions that help secure this goal like for instance operation + and x-bow as mentioned in the previous case where operation + introduces an extra safety vent and the x-bow that improves the crew comfort and their ability to rest. It is also important that the quality of the vessel and the equipment in terms of that it functions like it is intended and that it doesn't fail e.g that the thruster as mentioned doesn't fail. The shipyards can also contribute to standardizing the shipping companies' fleets which as mentioned enables the company to switch crew between the different vessels that reduces the need for training and thus eventually improves safety. At last is it also important that the suppliers provide training to the shipping company's crews in relation to the new equipment. This will also help to secure safer operations.



**Figure 31 - The four factors being an important part in terms of Bourbon's strategic planning (Bodenes 2013).**

The second factor is represented by the competence pillar and this deals with the crew's qualifications and skills (Bodenes 2013). It is in this relation important that the crew gets proper training and that the right people with the right qualifications are recruited. In terms of this, it is according to the informant normal for the oil company to have minimum requirements with regards to the different onboard positions. This is especially the case for in terms of the leading positions on board. For instance might it be stated that the captain is required to have 5 years of experience or that the chief officer is required to have 3 years of experience. This is also seen from the tender documents found in the tender where the shipping is required to provide a list of the entire crew in addition to their qualifications. If the crew in other words has experience beyond this, then this might be a positive factor when considering and evaluating the different bids.

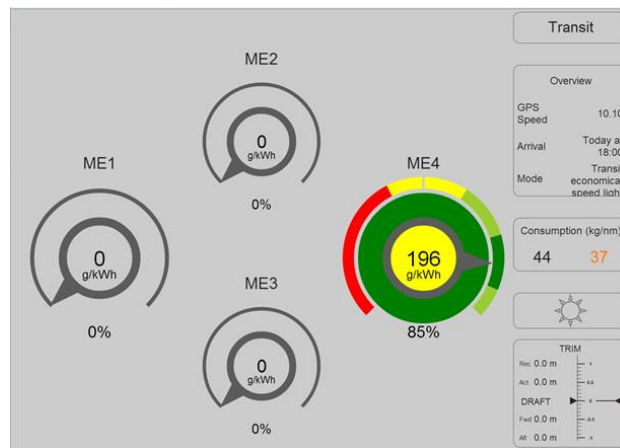
The crews qualifications and skills is important in terms of that it determines the quality of the service in that it to a great extent contributes to the safety of the operation in addition to that it can contribute to reducing the fuel consumption. The equipment suppliers and the shipyards can in connection to this also play a central role in terms of helping to train the crew how to use the equipment and vessels in order to minimize fuel consumption and secure safe and more efficient operations. This is especially important when new technology and new solutions are adapted that is not familiar to the crew. By the shipyards assisting to standardize the shipping companies' fleets it will to a greater extent be possible to switch crew between the different vessels that reduces the need for training since the all the vessels are familiar to the crew.

The third factor is represented by the technical availability pillar and this concerns the availability of vessels in the fleet (Bodenes 2013). In order to secure this, it is important for the shipping companies to have spare parts available and to execute planned maintenances. It is also important in order to secure this to have critical spare parts spread around different locations and to have repair centers (Bodenes 2013). In relation to this, it is clear that the shipyards and equipment suppliers also play a central role in order to secure this. First of all, is as mentioned on-time delivery important. If the supplier and/or shipyard fail to deliver on time then this might eventually lead to the shipyard failing to deliver the vessel on time which in the next turn impacts the technical availability rate and their track record in terms of this. It is also as mentioned important that the shipyard and equipment suppliers provide aftermarket services that make sure that the time the vessel is out of operations is minimized. The shipyard can at last also secure this by assisting the shipping companies in terms of standardizing their fleets. This will simplify aftermarket services and planned maintenances that will eventually reduce the time the vessel is out of operation.

The last factor that is represented by the cost optimization pillar in the figure above, concerns minimizing the associated costs and the total fuel consumption (Bodenes 2013). Cost minimization can be achieved by standardizing the fleet and crew training. Fuel consumption and reducing this also deals with proper crew training and raised crew awareness (Bodenes 2013). With regards to this pillar the different actors can also contribute here in terms of developing new solutions that reduces the fuel consumption and improves the efficiency. Example of this might be related to the design of the hull e.g like x-bow, machinery, engine, control system etc.

Initiatives like this that help secure reduced fuel consumption and thus also emissions in relation to supply vessels were addressed by Ellen Karoline Norlund, project manager for green logistics at Statoil, in a conference at Molde University College. Examples of such initiatives that were addressed in relation to this are for instance LNG operated vessels and ecometer on bridge that makes it possible to monitor the fuel consumption (Nordlund 2014). Ecometer on bridge makes it possible to monitor the fuel consumption and thus optimize the fuel consumption in such a way that the fuel costs and emissions are eventually reduced. The example of this is shown in the figure below. The actors can however in addition to this contribute in terms of standardizing the shipping companies'

fleet and help train the crew in terms of how the new equipment and solutions should be used in order to ensure this.



**Figure 32 - Ecometer on bridge in order to optimize fuel consumption (Norlund 2014)**

It is clear that quality in this link is also a total concept where several dimension are important. This imply that it is not only related to the quality of the service that is provided to the oil company but that it is also concerns the safety dimension in relation to this. What at the end of the day matters to the oil companies, is that they receive the service that they demand at a satisfactory quality and where the HSE-measures are secured. The factors such as the crew's competence, fleet/vessel availability and the efficiency of the operation help to determine the operation. In addition to this, is it as mentioned important that this is documented and that the shipping company have a proven track record in terms of this.

It is thus however clear that the quality of the physical product also help to determine the quality of the service in which different vessels are able to handle complex operation, onboard equipment/vessels that makes it possible to handle the operation more efficient etc. This is thus in accordance with the service dimensions as suggested by Lehtinen and Lehtinen (1982) in the literature. Another important dimension is however branding, trademarks etc that helps to signal quality. Such measures thus raise the buyer's expectation in relation to the service and which eventually helps to determine the perceived quality of the service when the buyer compares the actual quality of service.

### **5.3.5 Quality and competitive advantage**

When considering how what has been mentioned above impacts the actor's ability to tackle global competition, we must as mentioned look at interlink between the shipping company's value chain and the customer's value chain. We first of all have that the human resource management activity in the shipping companies' value chain activity which is related to their operations which is to provide the services to the oil companies, is connected to the oil companies operations in their value chain. The reason for this is clear in that human resource management in connection to the operation, which in this case deals with hiring the right crew with the right experience in addition to the training that the crew receives, impacts the operations in terms of factors such as safety and the efficiency of the operation.

When for instance hiring crew with an experienced background in terms of operating vessel in addition to that the crews receive proper training, then this impacts the safety of the operation. It in other words enables the shipping company to conduct safe operations which in the next step also can impact the oil companies operations. In the event of an accident it is clear that the oil companies operation also will be affected and when the safety is secured in such a manner it is thus clear that delays in relation to the oil companies operations to a greater extent will be avoided. The hiring of experienced crew and extensive training of the existing crews can also impact the efficiency of the shipping company's operation which in the next turn impacts the oil companies operations.

If for instance equipment or necessary chemicals are transported to the oil platform by a platform supply vessel in a faster and more efficient manner it is thus clear that the oil companies' operations can be affected in that the company saves time that can be exploited in their own operations. In order to achieve this one is exactly contingent on that the crew is qualified to operate the vessel and has sufficient knowledge with regards to how it can be handled in a most efficient manner. In this connection, it is as mentioned also important that the shipyards and equipment suppliers help in terms of training the crew how the equipment and vessel can be exploited in order to ensure efficient operations.

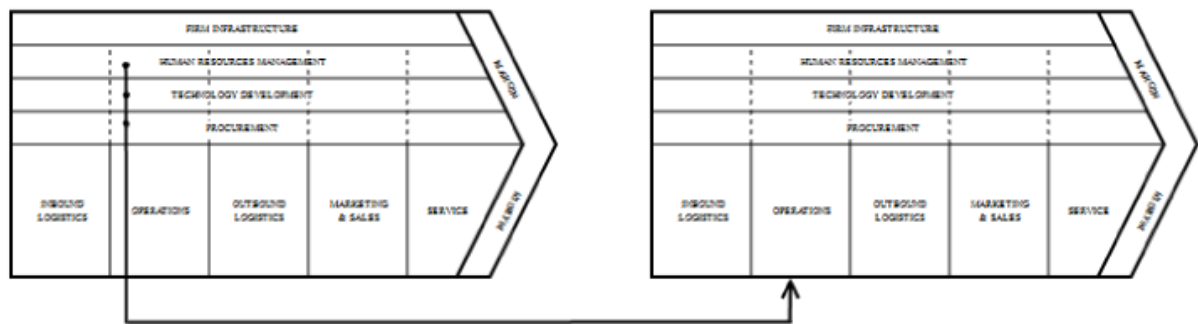
In order to secure safe and efficient operations it is however also important to contribute to developing new solutions that ensure this. There is thus a connection between the



technology development activity and the operations in the shipping companies' value chain that eventually might impact the oil companies' operation activity in their value chain. It is as mentioned important that the shipping companies in cooperation with the other actors such as shipyards, design offices and equipment suppliers develop new solutions that either as mentioned improves the safety in relation to the operation or that help ensure more efficient and environmental friendly operations. Improved safety in relation to the shipping companies' operations as mentioned reduces the likelihood of accidents occurring that in the next turn impacts the oil companies operations in that delays to a greater extent are avoided. In addition to this will more efficient operations possibly help save time that can be exploited in the oil company's own operations.

With regards to this, the companies in the cluster have an advantage related to that the shipping companies in this region to a greater extent knows the oil companies' operation. This knowledge is achieved through continuous interactions with the oil companies and relations that have been built in connection to oil companies that have operated on the Norwegian continental shelf since its infant years. The knowledge that has been gained through this continuous interaction since the beginning can thus be exploited when developing new solution in connection with the other actors in the cluster.

The operations on the Norwegian continental shelf are characterized in terms of its rough conditions and the knowledge with regards to this can thus be transferred to other areas. Because of this, the shipping companies in this region to a greater extent know what is required and what quality is necessary to provide in relation to this. It is also an advantage that all the actors are present in the cluster and they in close cooperation can develop new solutions and thus exploit the knowledge that the shipping companies possesses. This knowledge can also be important in relation to what was mentioned above with regards to the training of personnel. Since the shipping companies possess more knowledge with regards to the operations, then this can be exploited when improving the crew's competence and skills.



**Figure 33 - The interlinks between the shipping company's value chain and the oil company's value chain**

With regards to developing new solutions the shipping companies in this region also experience an advantage in terms of less rigid organizational lines. That this is the situation make it possible for the members of the crew to address and discuss relevant problems with for instance the top management and other employees in the organization with a higher rank or positions than themselves. In other cultures then this would not be case due to more rigid organizational lines and the workers do not in the same way feel free to address relevant question and problems that they might experience. That this is the case makes is possible for everybody in the organization to discuss relevant problems which in the next turn might lead to new solutions and innovations that impact the shipping companies operations and oil companies operations.

In addition to what has been mentioned it is also as mentioned important when procuring vessels to attempt to standardize the fleet. Standardizing the fleet as mentioned impacts the safety in which it easy to switch crew between the vessels and that most of the vessels are familiar to all in the crew. It is also important in terms of attempting to shorten the time the vessel is out of operation. When the vessel is out of operations then this might possibly also impact the oil companies' operation in that they might for instance experience increased delays. There is thus a connection between the procurement activity and the shipping companies operation that eventually impacts the oil companies' operation.

It is the abovementioned factors and their impact on the customer's value chain that contributes to gaining a competitive advantage. In relation to the shipping companies in the cluster it is especially the technology development activity in relation to the operation that separates them from other companies abroad. The shipping companies in the cluster as mentioned have gained knowledge through continuous interactions with the oil companies

on the Norwegian continental shelf over several years. This knowledge is related to the operations and what is required in relation to this. The knowledge can be exploited when developing new solution in cooperation with the other actors. The knowledge that is gained is also important when training crews. When developing new solutions it is also an advantage that all actors are present in the cluster that can be exploited in terms of sharing knowledge. In addition to this, does the shipping companies gain an advantage in terms of that the crew can discuss and address relevant problems directly to the top management. This is also an advantage when developing new solutions. It is this together with strong brands that help signal quality that shifts the demand curve upward allowing the parties to exert a profit. It is possible for the other parties to imitate this but factors such as relations and knowledge that is achieved over time in addition to cultural factors and the cluster effect is however more difficult to imitate.

## **6.0 DISCUSSION**

### ***6.1 Research Question 1***

#### **“What is the tendering process and how is the tendering process managed?”**

It can be seen from the empirical findings that the tendering processes in each link are in accordance with the purchasing process as described by Weele (2010). The first step starts downstream in relation to the oil companies and contractors that determine the specifications and the requirements that the service must fulfill. In relation to a new build, which is tailored to the needs of the oil company and contractor to be engaged on a long term contract, the vessels attributes and features that are necessary in order to provide the specific service must be thoroughly specified. As mentioned is there a difference in terms of longer and short term contracts where the short term contracts are handled by the brokers that run a tender. The next step in the process consist of the deciding the bidder's list as in accordance with what is described by Weele (2010). In terms of the long term contract it was seen that the parties that are registered in the Achilles portal are pre-selected to participate in the oil companies' tender. A request is thus available to all the actors registered in this portal.

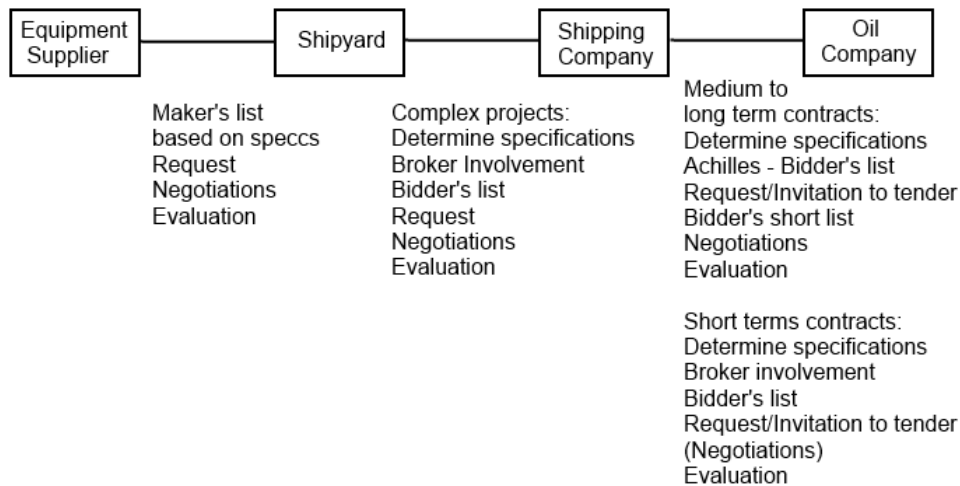
In the next stage these offers will be evaluated and the oil companies will decide on the bidder's short list which is also in accordance to what is described by Weele (2010) in

connection to the supplier selection stage. In connection to this part of the process the actors' previous interactions and relations with the company might be a decisive factor in terms of which of the actors are selected to make up this list. In other words, is it important that the bidding company have a track record or performance record in relation to the company. The oil company might then trust that the shipping company that it has been engaged in relations with previously will be able to provide what is required. This might in the next turn increase the shipping company's likeliness of being selected as one of the parties to make up the bidder's short list. That relations can be important part of purchasing in the private sector is in accordance with what is addressed by Arlbjørn & Freytag (2012). The parties that make up the bidder's short list will in the next part be invited to engage in negotiations with the oil company before a final evaluation takes place. It is as mentioned possible for the oil company to cancel the process and run a new tender if it is not satisfied with any of the terms.

Upstream in the next link the shipping companies will when it is interested in acquiring a new vessel that belongs to the upper class of the quality pyramid develop specifications. In terms of the vessels in the lower class of the quality pyramid the vessels can as mentioned be acquired in that the vessels are already pre-built and that the specifications have already been determined. When vessels in the upper class of the quality pyramid is built then this can be done in close cooperation with design office or the contractor and oil company if it is a new build that tailored to the parties needs to be engaged on a long term contract. In the next stage as in accordance with Weele (2010) the shipping company will send a request to the different shipyards based on the parties which are placed on the bidder's list. As mentioned will the parties that constitute the bidder's list in this link typically be parties that the shipping companies have developed close relations with and that they thus know are capable of providing what is necessary. When the project is complex, brokers are typically involved and will be the party that transmits a request to the shipyards. The shipyards will then respond to this before engaging in negotiations with the broker until a final evaluation takes place.

It is the specification and requirements developed in the previous links between the shipyards and the shipping companies that determine the maker's list. The equipment suppliers that constitute the maker's list are actors that are capable of doing the required job. In connection to this, are the previous relations with the actors important. The reason

for this is as mentioned that the shipyard and shipping company together will typically select a few supplier that it knows are capable of doing the required job. It is thus important for the equipment suppliers to develop close relations both in connection to the shipping companies and shipyards since this increases the likeliness of being selected to constitute one of the parties on the maker's list. The parties that constitute the maker's list are then requested to provide an offer to the shipyard. The equipment suppliers will then respond to this this request by providing their technical specifications and price. Finally, the parties will engage in negotiations until a final evaluation takes place. The different steps in the tendering process in each link is attempted to be summarized in the figure below.



**Figure 34 - The tendering process in its general form as identified in each link as in accordance with the tendering process as described by Weele (2010).**

What can be said with regards to the processes in the different link is that that the processes are complex that is impacted by several factors, something which have implications in terms of how these processes are managed. First of all, can there be several additional actors involved in these processes. Designers, contractors and brokers are just some of the additional actors that might be involved in the process depending on the circumstances. One of the informants at Ulstein also mentions a development in terms of new actors that comes in to the picture such as Goldman Sachs. These actors have attempted to handle the contractors' role without owning any assets. In addition to this, have some of the shipyards such as Ulstein developed in terms of moving closer downstream towards the oil companies and contractors by providing services in the lower

class segment. That new actors come into the play has implications in terms of the processes and thus only further complicates the picture.

It is also seen that there is a difference with regards to the process in terms of the complexity of the project. When the projects are more complex, then this has implications in terms of how the process is managed. Complex projects for instance imply that the importance of negotiations increases as in accordance with what was addressed Goldberg (1977) and Subramanian (2009). This is seen in our case in that the process in which vessels in the upper class of the quality pyramid are sold involves negotiations. When more standardized vessels are sold, negotiations are however less important since the focus on price increases. In relation to the oil companies and more long term contracts, where a new build is tailored to the specific needs of the oil company and contractor, the importance of the negotiation stage also increases.

This contrasts the more short term contracts that typically involve simple tonnage where negotiations are less important. This can be seen from the tender documents in the appendix (invitation to tender on behalf of oil company and contractor) where it is stated that the contract, which involves supplying tonnage, will be awarded to the bidder with the most favorable bid and where the charterer has no obligation to negotiate with the bidder. This is in accordance with what was addressed by Goldberg (1977) and Subramanian (2009) where negotiations tends to be the preferred means when dealing with more complex projects.

According to Subramanian (2009) as addressed in the literature negotiations are important when it is hard to specify what to buy and that the potential for value creation is great. This is exactly the case when for instance a new build is tailored to the specific needs of the oil company and contractor. When this is the case, it is hard to specify every detail in the requirements and specifications. The potential for value creation in this situation is also great and it thus advantageous for the oil companies to engage in negotiations with the bidders. Specifying too much at the initial stage without engaging in negotiations can thus actually according to Subramanian (2009) destroy the value creation potential and thus hinder innovation. Because of this, the negotiations stage is an important part of the process in terms of communicating quality and thus promoting innovation and value creation. A problem in relation to this however is when the oil companies negotiate with

several shipping companies. The shipping companies and the other actors engaged in the tender might then risk revealing solutions that can be exploited by the oil company in connection to the competitor that wins the tender. That this is the situation might make the actors less willing to share information that can be exploited.

The reason that the parties are however interested in running an auction prior to the negotiation stage is in order to attempt to create a competitive playing field where the price is lowered. This is especially possible for the oil companies since it is possible to run tenders that are available to international actors through the Achilles portal. This helps to create a competitive playing field where the numbers of bidders are great and which eventually leads to that the price is lowered as in accordance what is addressed by Subramanian (2009). In first-price sealed bid auctions (first-score sealed bid when dealing with several quality dimensions in addition to the price) as the case is here the bids are as addressed by Milgrom & Weber (1982) submitted in a sealed manner where the bids are reviewed by the auctioneer. Because of the bids are being placed in a sealed manner, where it is not possible for the other bidders to observe their competitors bid, and it is thus not possible to adjust their bid accordingly this.

The advantages related to a first-price sealed bid auctions is exactly its properties in terms of attracting bidders. The reason for this is according to Klempere (2002) exactly the uncertainty with regards to the rivals' bids. This gives the weaker bidders a greater chance of winning the auction compared to what the situation is in an ascending auction where the bidders are able to observe their rivals' bids. Because of this a greater number of bidders will be attracted when this is the case. The disadvantage related to running an auction that is followed by a negotiation stage is however that the bidders because of this will avoid providing their lowest bid since they know they are required to go through an additional stage in order to win the tender.

Another important issue that impacts these processes, is related to that the tendering processes in each of the different links are to a great extent relational and emotional based in that previous experience, relations and interactions with the parties can be of great importance. This in accordance with what is addressed by Arlbjørn & Freytag (2012) where the importance of relations and trust in connection to purchasing in the private sector is highlighted. Previous relations and interaction is especially important in each link

in terms of which companies are selected to constitute the bidder's list and the bidder's short list.

The processes are thus not as open and as formal as the public tendering practices subscribes. The difference here as can be seen compared to public tender is that the actors to a greater extent decide prior to the tender the different actors that will be addressed and that are thus allowed to provide an offer to the company based on previous relations and interactions. As we have seen in the literature are public tenders in most cases open where all bidders are allowed to provide their offer. The public tenders are also in fact open even though a prequalification stage is adapted. When this is the case as seen, the process is open in that all companies are allowed to show their interest and submit information that the authority uses in order to select the bidders that will be asked to participate in the tender. It is only as mentioned in rare circumstances where the process is not open and the authority negotiate directly with a few parties.

## ***6.2 Research Question 2***

### **“How is quality defined in the tendering process?”**

Quality can as we have seen from the previous cases be defined in the different links as a total concept in accordance with what was mentioned in the literature. With regards to the first case, it was seen that quality in this link it not only related to the quality of equipment and the failures associated to it. Just as important as the quality of the mechanical product is the quality of the aftermarket services that are provided to the shipyard or ship-owner after the purchase. This is in accordance with what was addressed by Takeuchi & Quelch (1983) where the quality of product and quality of the aftermarket services are closely related. In order to ensure top quality the company must in other words ensure top quality both in terms of the mechanical product and the aftermarket service that is provided.

If the company fails to provide quality in terms of the mechanical product, then this will be reflected in demand for aftermarket services and the need for this. Factors such as on-time delivery and branding are in addition to this important in relation to quality. That these factors also are important is in accordance with what was addressed by Takeuchi & Quelch (1983) in that the customer might perceive quality differently at the different stages through the purchasing process. At the initial stages on-time delivery, the quality of the



mechanical product and branding might be important while aftermarket services are more important after the purchase. In order to ensure quality all these factors must thus be satisfied throughout the different stages. If for instance the company fails to provide quality in terms of the mechanical product or if the aftermarket services that are provided to the customer are poor, then this might impact the company's brand and thus the customer's future purchases. This is in accordance with Kirmani & Rao (2000) where the importance of aftermarket services as a marketing measure in order to build strong brands is highlighted.

In the next link quality is also related to a total concept. In this link it could be seen that on-time delivery, aftermarket services and branding were also important dimensions in relation to quality in addition to the product attributes (design, innovations, onboard equipment etc.) that ensure safety, operability and efficient operations. The quality of the mechanical product and the quality of the aftermarket services are thus also in this link closely connected and quality at the different stages must also here be satisfied in order to ensure top quality as addressed by Takeuchi & Quelch (1983). In this link quality in terms of the physical attributes and features in connection to the vessels is also an important dimension in terms of quality as addressed by Reeves and Bednar (1994). Finally branding is also important in this link in that it helps to signal quality and thus raising the customer's expectations.

Quality in the last link can as mentioned also be seen as a total concept in that the quality of the service is important (is determined by the crew and their qualifications, the vessel and its attributes, the shipping companies' fleet and availability in terms of spare vessels) and that HSE-measures (might also be determined by factor such as crew and their qualification and the vessel and its attributes) are secured and documented in addition to that factors such as branding, trademarks might be important in order to signal quality and elevate these other factors. These factors are in accordance with the dimensions that determine service quality as addressed by Lehtinen and Lehtinen (1982).

The physical dimension is in this case related to the quality of the vessel and its attributes and different features. The second quality dimension in relation to service as suggested by the authors is connected to the company providing the service and its image. This is connected to measures such as branding and trademarks. The last dimension is as

mentioned related to the intangible factor and what is created in the interaction between the customer and the provider. This is in other words related to the service that is provided and which in this link is determined by the crew and their qualifications in addition to HSE and that these measures are secured.

The customer will according to Grönroos (1984) after the service has been provided compare his expectations with what has actually been provided. The comparison will in other words lead to the perceived quality of the service which will eventually impact the oil company's future purchases from the shipping company. The perceived quality of the service will in other words impact the shipping company's track record or performance record in relation to the oil company. This as mentioned might be important in term of future tenders when the bidder's short list is decided. Branding in this relation is important in terms of that it raises the customer's expectations. A company that promotes strong brands, trademarks, imaging etc must thus provide quality in a total perspective in order to support the brand or image that translates into raised customer expectations. The different quality factors in a supply chain perspective are summarized in the figure below.

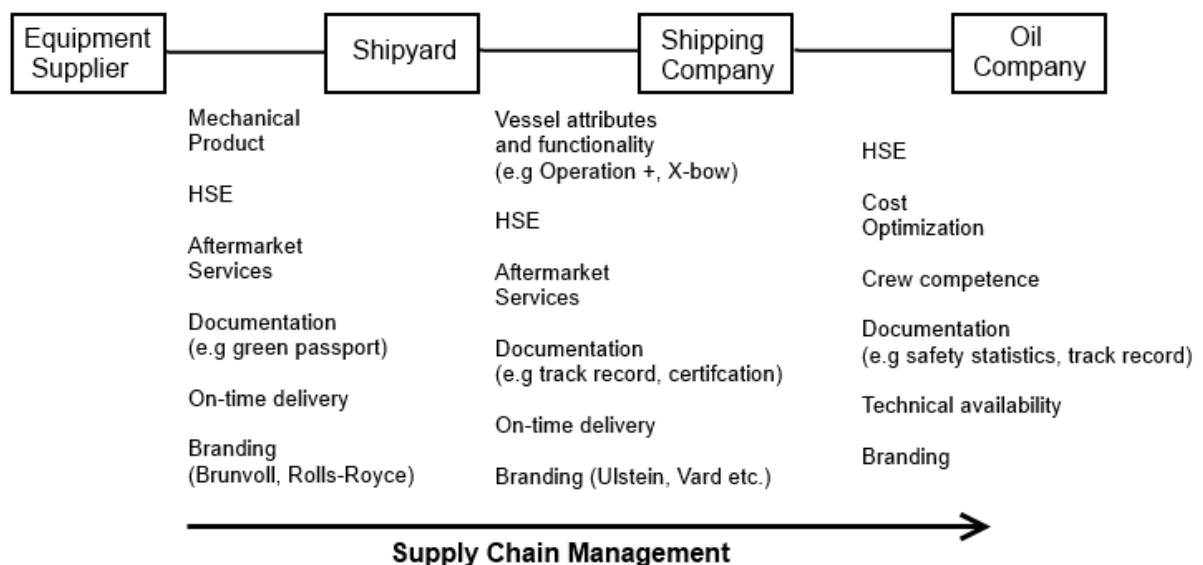


Figure 35 - The different quality dimensions in each link and the supply chain management perspective

Another important consideration in relation to quality, as can be seen from the figure above, is that it is of great importance that all the actors working together in order to make sure that the end customer's goals in terms of quality are secured. If the oil company should be able to achieve its goal in terms of safe operation for instance, it is then

necessary that all the actors work together in order to ensure this. If for instance the equipment fails like the thruster, then this might have implications in terms of the safety in relation to the vessel in that it might lead to an accident. The same is also the case in relation to the vessel in that it needs to function like it is intended in order to avoid accidents and thus secure the onboard safety. In this relation, it is also important to design the vessel and to introduce innovations such as operation + that helps to ensure onboard safety.

At last is it necessary in order to ensure safe operation that the shipping companies make sure that the crew is trained properly and that the right people with the right qualifications are hired. In other words, is it necessary upstream for the shipyard to procure equipment from suppliers that provides quality in relation to their product, the shipping companies must also be certain that a shipyard is chosen that promotes quality and finally must the oil company procure services from shipping companies that promotes safe operation by crew training and additional measures. In other words, is quality and what lies in this in relation the oil companies contingent on what happens upstream and not only the supplier but also the supplier's supplier and so on all the way upstream. Because of this, it can be seen that quality in many ways is defined by the end-customer and that it propagates upstream the supply chain. In other words is it the end-customer, which in our case are the oil companies, that dictates what is important to focus on in terms of quality.

In order to achieve the goals in relation to the end-customer it is because of this important to manage the entire supply chain in order to make sure that this is secured. This is in other words where supply chain management, as mentioned the literature, comes into the picture in order to ensure that the goals of the different actors are aligned in accordance that of the oil companies. Supply chain management as mentioned deals with the integration of the process in order to meet the needs of the end-customer (Cooper et al. 1997). In our case, this deals with the integration of the procurement processes in order to ensure that quality and what lies in this (it is as mentioned a total concept) is maintained in each different links such as the goal of the end-customer in terms of safe, reliable, efficient and environmental friendly operations (In other words the quality of the service and HSE-measures) are secured. The different quality dimensions in each link and the supply chain perspective is depicted in the above figure.

### **6.3 Research Question 3**

**“How is the trade-off between achieving a low price and satisfying the quality standards balanced, and how are the quality incentive problems dealt with?”**

#### **6.3.1 Price vs Quality**

That quality is a total concept as seen from the previous research question implies that a total perspective should be adapted when the different bids are evaluated and not only the price as in accordance with what was mentioned in the literature. In the first link if the shipyard or shipping company decides to buy the equipment from one of the cheaper equipment suppliers in the market, then this might have implication later in terms of that if the equipment breaks down and that the shipyard or shipping company thus must cover the costs themselves in order to fix the equipment since these services are not provided by the cheaper supplier. Such costs should thus also be taken into consideration as in accordance with Ellram & Siferd (1993) and Takeuchi & Quelch (1983) where all the costs that occur during the life-time of the equipment, in other words the product life-cycle costs, should also be considered.

The same is also the case in the next link in terms of services. In addition to this, might we have that the shipyard fails to delivery on-time and this will as mentioned have consequences in terms of that the shipping company has to rent costly replacement tonnage in addition to that it will impacts his technical availability rate and the track record in terms of this. These costs and inconveniences that possibly can occur should thus also be taken into considerations in accordance with this perspective. The same is also the case in the last link. If the safety in relation to the operations is not secured, then this will have implications in terms of that the number of accidents and incidents will be. Accidents might have several fatal consequences in terms of for instance injuries to people, insurance and compensation claims, delays in relation to the oil companies operation etc. The costs and the risk associated to this should thus also be considered when evaluating the different bids.

It is clear to the different actors that decisions are based in a total perspective where the price is balanced and weighted with these other factors. What is not necessarily as clear is how these different factors are weighted. It is thus also a difference here between what the

public tendering practices subscribes and the tender in the maritime sector. In a public tender situation, which is mentioned in the literature review, are the quality criteria and how this is weighted clearly communicated to the different actors. The actors then know that the price for instance is weighted 50 %, quality 30 % etc. and they can thus take this into consideration when preparing their offers. In our cases, we have however seen that this is not necessarily the situation here. This is especially the situation with regards to the oil companies and their tenders. In other words is it in relation to these processes not communicated how oil companies weight price with quality such as the quality of the service (crews' qualifications, mechanical quality of the vessel, attributes and innovations in connection to the vessel), HSE-measures, brands and trademarks etc. The shipping companies know that these factors are important to the oil companies but are however not able to say how much emphasis the oil companies will put on these different factors relative to the price. It is as mentioned the daily rate that represent the bottom and the additional factors are added to this to make-up the effective day rate.

It is for instance as mentioned not possible for the shipping companies to say how much emphasis is put on an Ulstein designed vessel relative to a Havyard designed vessel. Another example might be that it is not possible to say how much emphasis the oil companies put on a vessel that is built in China at a considerably lower price relative to a vessel that is built in Norway. A more specific example might be that the shipping company and shipyard in cooperation develops a new costly solution that for instance improves the safety in relation to the vessel and operation. It is however not possible for the shipping company and shipyard to say how much emphasis the oil companies' will put on this relative to the price when evaluating the different bids. The actors must therefore guess how the oil company will appreciate this and that this can be a decisive factor in terms of winning the tender.

In connection to this, it is also as mentioned important to develop close relations with the oil companies in order to get more knowledge with regards to how the oil companies appreciate the different factors and how much emphasis they might put on different solutions. This is thus another example of the importance of relation in connection to these processes. In terms of this and the processes that the equipment suppliers and shipyards are engaged in, relations can also said to be important here. The reason as mentioned is that the different actors through their relations with the shipyards or the shipping companies

know which of the actors that demands top notch quality. In other words, in order to be able to know what is important to the different actors it is necessary to develop close relations.

The advantages related to communicating clearly how the different factors are weighted is clear in that it provides the bidders the opportunity to know what to emphasize and it will thus make it easier when preparing the different bids. It will also to a greater extent let the different bidders compete on a more fair ground in that the parties know what the oil companies will emphasize during the evaluation stage. The disadvantages are however related to that it reduces the oil companies' flexibility. The reason for this is that the oil companies must then prior to the tender specify what one should focus and the different priorities. This can sometimes be hard to know and thus to specify before one has been engaged in negotiations with the parties. In accordance to what is addressed by Subramanian (2009) can specifying too much prior to the tender actually end up destroy potential value creation. Specifying and communicating criteria might in other words actually hinder innovation. It is first at the negotiation stage prior to the auction that the actors are able to learn their preferences and share ideas. That the oil companies have not communicated the criteria might thus give them greater flexibility in the later stages and thus forces the bidders to prioritize differently in their bids based on their knowledge of what is important to the oil company.

### **6.3.2 Quality incentive problems**

With regards to the quality incentive problems, it is seen that this is dealt with in the different links by adopting many of the same measures. The ex-ante problem in which the auction only attracts the weaker bidders as addressed by Bergman & Lundberg (2013) is to a great extent avoided in that the process is not open to all bidders. In the first two links as mentioned only a few bidders that are present on the maker's or bidder' list will be addressed. In addition to this, is the market rather established and the different actors through their previous relation know which of the actors that demand top notch quality. This is thus in accordance with what was addressed by Klein & Leffler (1981) where the author suggests adopting a pre-qualification stage in order to cope with this problem.

It is also possible for the different actors to signal quality that helps prevent this problem. In the last link this problem is however also dealt with in that the bidders are screened thoroughly prior to the tender in which the bidders has to provide documentation when registering in Achilles. That it is possible for the different actors to signal quality and that the actors are screened thoroughly prior to the tender is in accordance with what was suggested by Kirmani & Rao (2000) & Spencer (1973). Screening according to Spencer (1973) implies that the companies exactly have to provide information related to certain factors prior to the tender. It is thus an initiative from the principal's side. Signaling according to Kirmani & Rao (2000) is however an initiative from the agent's side and is related to that the agent uses different marketing measures such as branding, trademarks etc to signal quality. It can thus be seen that this problem is to a great deal with compared to a public tender that is open and where price is the only sole criterion. When this is the case, this problem is likely to occur.

The ex-post problem as addressed by Bergman & Lundberg (2013) is also dealt with in the different links by adopting many of the same measures. What first of all is common in all three links is that company selects bidders that the company trusts and that have a good reputation in relation the company and the other actors in the market. In the first two links we saw that the actors present on the maker's list and the bidder's list to a great extent are actors that the company trusts through its previous relations with. The same is also the case in terms of the last link where actors that the oil company trusts are put on the bidder's short list.

Trust, which is closely related to reputation and what lies in this, as mentioned in the literature helps to avoid opportunistic behavior such as quality deterrence (Douma & Schreuder 2013). When one of the actors cheat this will also impact their reputation in relation to contracting party and other actors in the market as addressed by Klein & Leffler (1981). The companies in the different links can thus also base their decision when deciding the actors on the bidder's list whether to exclude parties with a bad reputation. In addition to this, are options also introduced into the contracts in the three different links in order to avoid this problem. The option in the contracts as mentioned according to Edin & Hermalin (2000) functions as a "threat effect" in that it helps to discipline the supplier into avoid deterring quality. The supplier (agent) then knows that if it deters quality then the contracting party (principal) will avoid exercising the option in the later stages. This

altogether helps ensure that the future gains exceed the short terms gains by deterring quality.

What is important according to Klein & Leffler (1981) is however that the future gains of avoiding deterring quality exceeds the short terms gains of behaving opportunistically by deterring quality. It is however important in relation to this that the amount or period that could be extended when exercising the option is sufficient. The greater for instance in terms of the number of equipment or vessels or the length of the extension period in the option, the greater will the gains of avoid deterring quality be. In relation to the oil companies and their contract with the shipping companies, is it also as we have seen possible to impact the short term gains by determining the length of the contract. The shorter the contract is, the greater are the long term gains of avoid deterring quality or in other words the lower are the short term gains of deterring quality compared to the situation with a longer contract. This is in accordance with Klein & Leffler (1981) in that one must ensure in order to avoid this problem that the future gains exceeds the short terms gains of avoid deterring quality. It can thus be seen that it in relation to the oil companies and their contracts with the shipping companies is possible to adopt this additional measures.

The reason that this is necessary is that we in this link deal with offshore marine services and as mentioned have services something to do with that is intangible and that thus is harder to verify ex-post as in accordance with what was mentioned by Klein & Leffler (1981). In the two other links we also deal with aftermarket services that are intangible, but the difference in this link is however that we deal entirely with services and one must thus expect the quality incentive problem to a greater extent be present here. In order to prevent this problem one must thus in this link use a mix of the abovementioned measures. The different measures that are adopted in relation to the two problems are summarized in the figure below.



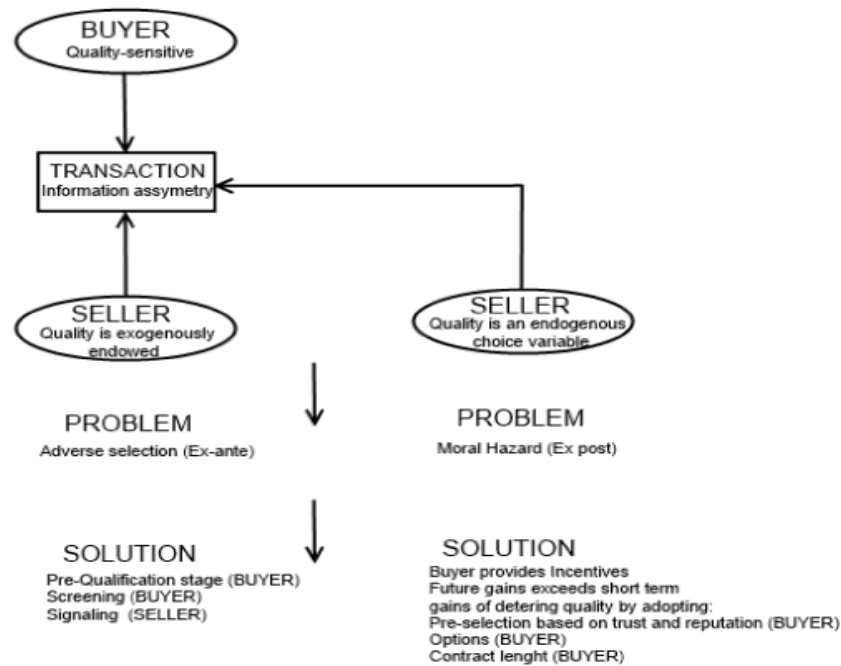


Figure 36 - The quality incentive problems and the different measures adopted by the maritime actors in order to cope with these problems. Based on figure from (Kirmani & Rao 2000).

#### 6.4 Research Question 4

**“How do the associated quality factors in the tender relate to the actors’ ability to meet global competition?”**

The competitive advantage that is gained by the actors in the cluster relative to their global competitors is related to two factors. It is first of all related to the quality that is provided, which has been discussed earlier. Quality is as mentioned related to several dimensions such as the quality of the mechanical product and the quality of the aftermarket services that are provided to the customer. These quality dimensions can in addition to this be supported by strong brands and trademarks that help signal quality and elevate the other factors. When it comes to the quality of the mechanical product and the attributes in connection to the vessel, there can as mentioned be a difference between the Norwegian and some of the global actors. The reason for this is to a great extent related to the cluster effect. In the cluster all the actors are present and the equipment suppliers, shipyards and design offices are thus closer to the problem in which the majority of the shipping companies are also situated in this region.

This does in other words give the equipment suppliers and the shipyards the opportunity to address different problems and share knowledge in connection to the shipping companies

that are present in the cluster. That this is the case gives the parties an advantage when developing new solutions in addition to the integration part of these different solutions. It is also to a certain extent related to cultural factors in that workers in the Norwegian culture are allowed to address the top management. That this is the case makes it possible for the workers down in the organization to ask questions and address the top management in order to suggest possible solutions and improvements. With regards to the aftermarket services, there is also a difference between some of the Norwegian actors and the global actors. Many of the Norwegian actors offer supreme aftermarket service such as Brunvoll that has the in-house expertise in addition to all the necessary spare part in stock.

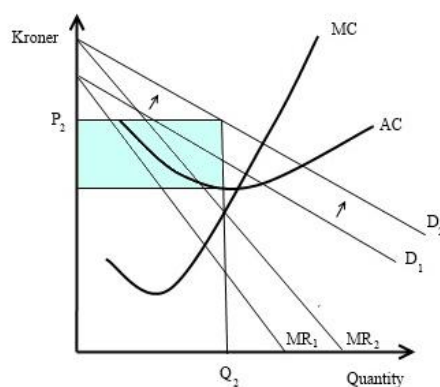
The competitive advantage that is achieved by the actors in the cluster in terms of quality is however to a great extent supported by strong brands and trademarks. Many of the actors in the cluster like Ulstein, Vard, Skipsteknisk etc have over time managed to build strong brands and trademarks. The UT-design for instance was launched as far as back in the 70s and because of this many of the actors are familiar with this design. These brands help to signal quality and thus impacting the customers' perception of the vessel/product. According to Breit & Ransom (1971), as mentioned in the literature, two products might be identical, but the customer might be willing to pay more for the product that is supported by a strong brand and that he is familiar with. What is important in this relation is in other words what the customer perceives. If the shipping company or oil company perceives that an Ulstein designed vessel is superior in terms of quality than many of their competitors, then this is what matters and not necessarily the actual quality of the vessel.

A brand however as mentioned in the literature has to be supported by quality since the customer after the purchase compares his expectations with the actual performance. If the company fails to provide quality to support this brand or trademark, then this might weaken the brand or trademark on a long term basis. That this is the case has made it possible for Ulstein to produce vessels in the lower class of the quality pyramid that is still perceived to be quality vessels (compared to some of its competitors) due to the Ulstein brand being attached to these vessels. Many of the equipment suppliers in the cluster such as Brunvoll have also managed to develop strong brands and trademarks. This is as mentioned important in relation to the shipping companies and oil companies. In terms of this, the goal of the equipment suppliers is to develop strong brands in such a way that the

oil companies and shipping companies in their specifications request equipment specifically from their side.

It is these tangible and intangible differences in terms of quality in accordance with Chamberlain (1965) that has managed the actors to differentiate their product and thus shifting the demand curve upwards. This has eventually led to that the customers are able to tackle competition from abroad. It is however important in accordance with Chamberlain (1965) for the actors to continue promoting the above mentioned in terms of quality and branding. The reason for this is that the global actors on a long term basis will attempt to imitate these different factors and thus shifting the demand curve downwards again towards the long-run equilibrium as addressed by Chamberlain (1965).

In this relation, it is however important to mentioned that quality in terms of the mechanical product and aftermarket services can be quite easily imitated by the actors. The cluster effect and the advantages related to this in addition to branding are however more difficult to imitate. This is especially true in relation to branding. The reason for this is that it takes time for the competitors to build a strong brands and trademarks that are capable of competing with the cluster's actors. This is for instance exemplified with the UT-Design that was developed as early as in the 1970s. In order for this to be possible the global actors must develop high quality products that are supported by aftermarket services. Through continuous interactions over time with the customer by providing this and through marketing measures, the actors will eventually develops brands that enable them to compete with the cluster's actors. The actors in the cluster however in order to prevent this must thus continue to promote their strong brands in addition to continuously develop new solutions in cooperation with the other actors by exploiting the cluster effect and the cultural factors. This will shift the demand curve upwards again thus reversing the development.



**Figure 37 - Tangible and intangible differences shifting the actors' demand curve upwards allowing to tackle competition. Figure adapted from Waldman & Jensen (2013)**

The competitive advantage that the companies in the cluster experience is however not only related to the quality. It is also to a certain extent connected to that the shipping companies that are present in the cluster have developed close relations with many of oil companies. Many of the shipping companies have been present providing services to the oil companies that operate on the Norwegian continental shelf since the beginning. This has led to that the shipping companies have developed close relations with many of oil companies. Relations are as mentioned important in that it can be a decisive factor in terms of the companies that are selected to be on the bidder's short list in connection to the oil companies' tenders. It is in other words an advantage that the actors in this cluster have a track record or a performance record in terms of their previous projects and interactions with many of the oil companies on the Norwegian continental shelf. This serves as documentation that the actors in the cluster are able to provide safe, reliable, efficient and environmental friendly operations.

That the shipping companies in this region have developed close relations with many of the oil companies operating on the Norwegian continental shelf, is however also advantageous in relation to the other actors upstream. The reason for this is that it represents an advantage when developing new solutions in cooperation with the other actors. The shipping companies through their relations with the oil companies to a greater extent know what is important to focus on and they know what is required in terms of quality in addition to the operations and how they are conducted. This thus represents an advantage when all the actors in cluster in cooperation develop new solutions. The

relations are because of this closely connected to quality in terms of developing new solutions. The competitive advantage that the Norwegian actors in this cluster experience can thus be related to the quality that is provided in addition to close relations that the actors have developed. This is summarized in the figure below.



**Figure 38 - The underlying factors impacting the actors' competitive advantage**

## **7.0 CONCLUSION AND FURTHER RESEARCH**

### **7.1 Conclusion**

In this thesis we have by conducting a multi cases study explored the tendering process and quality in each different link in the marine service offshore supply chain. Four research questions were asked and data was by collected by relying on interviews as the primary data source that was supported by secondary data sources. The findings show that the tendering processes in its general form in each link is in accordance with what is addressed in the literature where determining specifications, deciding the bidder's list and bidder's short list, request/invitation to tender are the common steps in the tendering process. It is however also seen that these processes are complex and that no clear answers necessarily always exists in terms of how these processes are managed.

Several factors impacts how these processes are set out and how they are managed. There might be several additional actors involved such as designers, contractors, brokers, financial institutions etc that all can influence these processes. In addition to this can the complexity of the project determine how these processes are managed. When the projects are complex this for instance implies that the importance of the negotiation stage increases as in accordance with the literature. Finally, can relations and previous interactions be an important factors in terms of which the actors are selected to the on the bidder's list and

the bidder's short. That the actors are pre-selected based on such factors contrast the public tenders where the tenders are open and where all potential bidders are allowed to show their interest.

With regards to quality the findings show that quality in each link is a total concept that depends on several dimensions. It is as mentioned not only related to the physical product or the service but also additional dimensions are important such as aftermarket services, on-time delivery, HSE-measures, documentation, branding etc. The findings have also shown in relation to quality the importance of supply chain management in order to ensure that all the actors' procurement processes are in accordance with the goals of the ultimate customer which in this case is the oil companies and their goal in terms of safe, efficient, reliable and environmentally friendly operations. All actors must make sure that the procurement process is in accordance with this.

Since quality is total concept, then this implies that decisions are taken in total perspective where all these dimensions are taken in to consideration and not only the price of the physical product or the service. For instance is it important after the purchase that the actors are provided the right support in the event of any defects or any other inconveniences. The costs that arise if this is not provided should thus also be taken into consideration when balancing the price and quality. How these different factors are balanced and weighted with the price is however not necessarily communicated to parties. This is especially the case in relation to the oil companies. This contrast the public tendering processes where it is clearly communicated how these different factors are weighted. It is both advantages and disadvantages related to this. Especially the advantages in relation to the oil companies' flexibility and thus potential for value creation should be emphasized when this is not communicated to the different actors. That this is the situation makes it important to gain experience and attempt to develop relations in order to get knowledge with regards to this.

The ex-ante quality problem is as mentioned to a great extent handled by that the parties are pre-selected, which implies that the companies select the companies that it wants to address. It is also secured in that the different selling parties can signal quality by developing brands and trademarks. In the third link this is also handled in that the parties are screened prior to registering in the Achilles portal, where one has to provide

documentation for different systems. The ex-post problem is handled in each link by relying on the different actors' reputation and in that the auctioneers select actors that they trust and have been engaged with earlier. In addition to this are options that introduces a threat effect implemented into the contract. In the last link it is also possible to vary the contract length. In relation to this, it was also seen that the importance of relying on all these measures in the third link since we here deal entirely with services. The need of implementing a mix of the different measures thus increases.

The finding finally show that the companies in the cluster have gained a competitive advantage that is related to the quality in connection to services and products provided in addition to the relations that exist between the shipping companies and oil companies through continuous interactions in connection to their operation on the norwegian continental shelf. The competitive advantage that is gained in connection to quality of the physical products is to a great extent related to the development of new innovations and solutions. This is directly related to the cluster effect where all parties benefit from all the actors being present in terms of sharing knowledge and ideas with regards to innovations and integration of different solutions. The cultural factor in terms of less rigid organization lines is also an important factor when developing new solutions. This contrasts some of the global actors where more rigid organizational lines exist which implies greater distance between the employees and the top management.

The competitive advantage related to quality is however also related to that the actors in the cluster, especially equipment supplier, provides better aftermarket services than many of their competitors. That the actors have managed to tackle global competition is however not only related to the quality in relation to the vessels/equipment and quality of the services. These dimensions are supported by strong brands and trademarks that have been developed over time through continuous interaction with the customers. This factor is more difficult for the other actors outside the cluster to imitate since it takes time to develop a strong brand that are able to compete on the same terms and it thus the main reason why many of the actors in the cluster have managed to tackle global competition.

The competitive advantage is however also as mentioned related to the relations the shipping companies have developed in connection to the oil companies that have operated on the Norwegian continental shelf. That this is the case is an advantage as mentioned

when the bidder's short list is decided since the shipping companies in this region have a track record in relation to the oil companies and this thus represents an advantage. Because of these relation the shipping companies in this region also to a greater extent knows what is important and the oil companies' operation. This is advantageous for the upstream parties when developing solutions.

## ***7.2 Further research***

The limitation related to this study is as mentioned that is not possible to generalize the findings. In order to be able to generalize the study to the whole population, which in this case consist of the all the maritime companies in the cluster, one must thus conduct a more quantitative study where an appropriate sample representing the whole population is investigated. In a further research situation one should thus consider to conduct a quantitative survey study in order to validate the findings in this thesis and in order to be able to generalize the findings to the whole population. In a further research situation it can also be interesting to include foreign actors in order to attempt to contrast and complement the findings. This is especially important in order attempting to explain how the actors in the cluster have an achieved a competitive advantage and the importance of cluster in relation the actors in this region.



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# APPENDIX

## Appendix A: Interview Guide - Brunvoll (Equipment Supplier)

Research Question	Interview Question
Introduction	<p>Can you as an introduction please tell something about your:</p> <ul style="list-style-type: none"> <li>• Background (Education, work experience)</li> <li>• Work and area of responsibility at Brunvoll</li> </ul>
<p>What is the competitive tendering process and how is the process managed?</p>	<p>Can you on a general term say something with regards to the shipyards' procedures in connection to their acquisition of equipment/thrusters?</p> <p>Is there a difference with regards to this process when the shipping companies building according to specification versus when the shipyards build vessels on their own account and risk?</p> <p>Is there a difference with regards to the process when designers are involved compared to when this is not the case?</p> <p>Is there a difference with regards to the process when Brunvoll sell thrusters to customers belonging to the offshore supply sector compared to other customers e.g cruiseliners, fish industry?</p> <p>What is required to be on the bidder's list (In other word to be allowed to provide an offer to the shipping company)?</p> <p>What is the importance of previous relations?</p> <p>How many are invited to provide an offer to the shipyard and what significance does this have in terms of the outcome?</p> <p>Is it usual for the shipyards to develop specification?</p> <p>Are there any negotiations after the tender process?</p>

	<p>If this is the case, what is the magnitude or extent of these negotiations?</p> <p>Are the negotiations conducted in relation to one or more actors?</p> <p>After the seal bid process and the following negotiations do the actors have to agree on a contract or is it possible to issue a new round, with new actors?</p> <p>Who are all the involved actors in this process?</p> <p>Can you on a general term say something with regards to the different actors' role in this process?</p> <ul style="list-style-type: none"> <li>• Shipping company</li> <li>• Shipyard</li> <li>• Design office</li> <li>• Brokers</li> <li>• Equipment supplier</li> </ul> <p>Can you more specifically say something with regards to Brunvoll's role in this process?</p>
<p>How is quality defined in the tendering process?</p>	<p>What are the most important parameters in terms of quality?</p> <ul style="list-style-type: none"> <li>• The informant is first asked to suggest different factor until some factor are suggested to the informant if they are not mentioned</li> <li>• Product attributes (thrusters that secures a low level of noise, solutions that ensures the onboard safety, thruster that ensures operational efficiency, thruster that contribute to lowering fuel consumption, uniqueness)</li> <li>• Services, spare parts and aftermarket</li> <li>• On-time delivery</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> </ul>
<p>How is the trade-off between achieving a low price and satisfying the quality standards balanced, and how are the quality</p>	<p>Is it clearly stated how price and quality is weighted in the evaluation stage?</p>

<p>incentive problems dealt with?</p>	<p>What consideration does Brunvoll do with regards to price and quality? (How willing is the company to sacrifice the one for the other)</p> <p>How would you based on your experiences rank the different factors mentioned above?</p> <ul style="list-style-type: none"> <li>• Product attributes (thrusters that secures a low level of noise, solutions that ensures the onboard safety, thruster that ensures operational efficiency, thruster that contribute to lowering fuel consumption, uniqueness)</li> <li>• Services, spare parts and aftermarket</li> <li>• On-time delivery</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Is it normal to introduce options into the contract?</p> <p>How important are relations and the supplier's reputation?</p>
<p>How do the associated quality factors in the tender relate to the actors' ability to meet global competition?</p>	<p>Is what is emphasized above with regards to quality something the customers are willing to pay for? (Increased willingness to pay)</p> <p>If this is the case, is there any difference between the different actors with regards to the willingness to pay? (actors abroad versus actors belonging to the cluster)</p> <p>Have you based on your experiences observed any difference between shipyards belonging to the cluster and the other norwegian shipyards with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (thrusters that secures a low level of noise, solutions that ensures the onboard safety, thruster that ensures operational efficiency, thruster that contribute to lowering fuel</li> </ul>



	<p>consumption, uniqueness)</p> <ul style="list-style-type: none"> <li>• Services, spare parts and aftermarket</li> <li>• On-time delivery</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipyards situated abroad and shipyards belonging to the cluster with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (thrusters that secures a low level of noise, solutions that ensures the onboard safety, thruster that ensures operational efficiency, thruster that contribute to lowering fuel consumption, uniqueness)</li> <li>• Services, spare parts and aftermarket</li> <li>• On-time delivery</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipyards situated abroad and the other norwegian shipyards with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (thrusters that secures a low level of noise, solutions that ensures the onboard safety, thruster that ensures operational efficiency, thruster that contribute to lowering fuel consumption, uniqueness)</li> <li>• Services, spare parts and aftermarket</li> <li>• On-time delivery</li> <li>• Environmental factors and certification</li> </ul>
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	<ul style="list-style-type: none"> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>What is the importance of buying from suppliers present in the cluster for the equipment suppliers with regards to winning contracts?</p> <ul style="list-style-type: none"> <li>• In relation to shipyards belonging to the cluster</li> <li>• In relation to other norwegian shipyards</li> <li>• In relation to shipyards situated abroad</li> </ul> <p>Is there a clear difference between the different equipment suppliers?</p> <p>Is there an important difference between the actors with regards to who Brunvoll has been engaged with earlier versus does who Brunvoll has not been engaged with earlier?</p> <p>What is the importance of the cluster's renommé for Brunvoll in competition with actors situated outside the cluster?</p>
Ending	<p>Other issues that the informant wants to address</p> <p>Address the question related to confidentiality and other formalities</p> <p>Address the possibility for follow up question via mail or telephone</p> <p>Thank the informant</p>

*Appendix B: Interview Guide - Ulstein (Shipyards)*

<b>Research Question</b>	<b>Interview Question</b>
Introduction	<p>Can you as an introduction please tell something about your:</p> <ul style="list-style-type: none"> <li>• Background (Education, work experience)</li> <li>• Work and area of responsibility at Ulstein</li> </ul>
<p>What is the competitive tendering process and how is the process managed?</p>	<p>Can you on a general term say something with regards to all the possible ways/all the different steps that are taken in connection to the shipping companies' acquisition of vessels?</p> <p>What is required to be on the bidder's list (In other words to be allowed to provide an offer to the shipping company)?</p> <p>What is the importance of previous relations?</p> <p>How many are invited to provide an offer to the shipping companies and what significance does this have in terms of the outcome?</p> <p>Is it usual for the shipping companies to develop specification?</p> <p>Are there any negotiations after the tender process?</p> <p>If this is the case, what is the magnitude or extent of these negotiations?</p> <p>Are the negotiations conducted in relation to one or more actors?</p> <p>After the seal bid process and the following negotiations do the actors have to agree on a contract or is it possible to issue a new round, with new actors?</p> <p>Who are all the involved actors in this process?</p>

	<p>Can you on a general term say something with regards to the different actors' role in this process?</p> <ul style="list-style-type: none"> <li>• Shipping company</li> <li>• Shipyard</li> <li>• Design office</li> <li>• Brokers</li> <li>• Equipment supplier</li> </ul> <p>Can you more specifically say something with regards to Ulstein's role in this process?</p> <ul style="list-style-type: none"> <li>• Ulstein Design &amp; Solutions</li> <li>• Ulstein Shipyard</li> </ul>
<p>How is quality defined in the tendering process?</p>	<p>What are the most important parameters in terms of quality?</p> <ul style="list-style-type: none"> <li>• The informant is first asked to suggest different factor until some factor are suggested to the informant if they are not mentioned</li> <li>• Product attributes (that secures a low level of noise, safety, operability, uniqueness)</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> </ul>
<p>How is the trade-off between achieving a low price and satisfying the quality standards balanced, and how are the quality incentive problems dealt with?</p>	<p>Is it clearly stated how price and quality is weighted in the evaluation stage?</p> <p>What consideration does Ulstein do with regards to price and quality? (How willing is the company to sacrifice the one for the other)</p> <p>How would you based on your experiences rank the different factors mentioned above?</p> <ul style="list-style-type: none"> <li>• Product attributes (that secures a low level of noise, safety, operability, uniqueness)</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul>

	<p>Is it normal to introduce options into the contract?</p> <p>How important are relations and the supplier's reputation?</p>
<p>How do the associated quality factors in the tender relate to the actors' ability to meet global competition?</p>	<p>Is what is emphasized above with regards to quality something the customers are willing to pay for? (Increased willingness to pay)</p> <p>If this is the case, is there any difference between the different actors with regards to the willingness to pay? (actors abroad versus actors belonging to the cluster)</p> <p>Have you based on your experiences observed any difference between shipping companies belonging to the cluster and the other norwegian shipping companies with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (that secures a low level of noise, safety, operability, uniqueness)</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipping companies situated abroad and shipping companies belonging to the cluster with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (that secures a low level of noise, safety, operability, uniqueness)</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipping companies situated abroad and the other</p>

	<p>norwegian shipping companies with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (that secures a low level of noise, safety, operability, uniqueness)</li> <li>• Environmental factors and certification</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>What is the importance of buying equipment from equipment suppliers (for instance Brunvoll) in the cluster for shipyards with regards to winning contracts?</p> <ul style="list-style-type: none"> <li>• In relation to shipping companies belonging to the cluster</li> <li>• In relation to other norwegian shipping companies</li> <li>• In relation to shipping companies situated abroad</li> </ul> <p>Is there a clear difference between the different shipyards?</p> <p>Is there an important difference between the actors with regards to who Ulstein has been engaged with earlier versus does who Ulstein has not been engaged with earlier?</p> <p>What is the importance of the cluster's renommé for Ulstein in competition with actors situated outside the cluster?</p>
Ending	<p>Other issues that the informant wants to address</p> <p>Address the question related to confidentiality and other formalities</p> <p>Address the possibility for follow up question via mail or telephone</p> <p>Thank the informant</p>

*Appendix C: Interview Guide - Remøy Shipping (Shipping Company)*

<b>Research Question</b>	<b>Interview Question</b>
Introduction	<p>Can you as an introduction please tell something about your:</p> <ul style="list-style-type: none"> <li>• Background (Education, work experience)</li> <li>• Work and area of responsibility at Remøy</li> </ul>
<p>What is the competitive tendering process and how is the process managed?</p>	<p>Can you on a general term say something with regards to the oil companies' procedures or different steps in connection to their acquisition of offshore marine services?</p> <p>What is required to be on the bidder's list (In other word to be allowed to provide an offer to the oil companies)?</p> <p>What is the importance of previous relations?</p> <p>How many are invited to provide an offer to the oil companies and what significance does this have in terms of the outcome?</p> <p>Is it usual for oil companies/contractors to develop specification?</p> <p>Are there any negotiations after the tender process?</p> <p>If this is the case, what is the magnitude or extent of these negotiations?</p> <p>Are the negotiations conducted in relation to one or more actors?</p> <p>After the seal bid process and the following negotiations do the actors have to agree on a contract or is it possible to issue a new round, with new actors?</p> <p>Who are all the involved actors in this process?</p> <p>Can you on a general term say something with regards to the different actors' role in this process?</p>

	<ul style="list-style-type: none"> <li>• Shipping company</li> <li>• Shipyard</li> <li>• Design office</li> <li>• Brokers</li> <li>• Equipment supplier</li> </ul> <p>Can you more specifically say something with regards to Remøy's role in this process?</p>
<p>How is quality defined in the tendering process?</p>	<p>What are the most important parameters in terms of quality?</p> <ul style="list-style-type: none"> <li>• The informant is first asked to suggest different factor until some factor are suggested to the informant if they are not mentioned</li> <li>• Product attributes (Design of the vessel, equipment, functionality, fuel consumption)</li> <li>• Operability and safety</li> <li>• Crew and their qualifications</li> <li>• Environmental factors and HSE-measures</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> </ul>
<p>How is the trade-off between achieving a low price and satisfying the quality standards balanced, and how are the quality incentive problems dealt with?</p>	<p>Is it clearly stated how price and quality is weighted in the evaluation stage?</p> <p>What consideration does Remøy do with regards to price and quality? (How willing is the company to sacrifice the one for the other)</p> <p>How would you based on your experiences rank the different factors mentioned above?</p> <ul style="list-style-type: none"> <li>• Product attributes (Design of the vessel, equipment, functionality, fuel consumption)</li> <li>• Operability and safety</li> <li>• Crew and their qualifications</li> <li>• Environmental factors and HSE-measures</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul>



	<p>Is it normal to introduce options into the contract?</p> <p>Is it normal to have varying contract lengths?</p> <p>How important are relations and the supplier's reputation?</p>
<p>How do the associated quality factors in the tender relate to the actors' ability to meet global competition?</p>	<p>Is what is emphasized above with regards to quality something the customers are willing to pay for? (Increased willingness to pay)</p> <p>If this is the case, is there any difference between the different actors with regards to the willingness to pay? (actors abroad versus actors belonging to the cluster)</p> <p>Have you based on your experiences observed any difference between shipping companies belonging to the cluster and the other norwegian shipping companies with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (Design of the vessel, equipment, functionality, fuel consumption)</li> <li>• Operability and safety</li> <li>• Crew and their qualifications</li> <li>• Environmental factors and HSE-measures</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipping companies situated abroad and shipping companies belonging to the cluster with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (Design of the vessel, equipment, functionality, fuel consumption)</li> <li>• Operability and safety</li> <li>• Crew and their qualifications</li> <li>• Environmental factors and HSE-measures</li> <li>• The company's renommé/Trademark</li> </ul>

	<ul style="list-style-type: none"> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>Have you based on your experiences observed any difference between shipping companies situated abroad and the other norwegian shipping companies with regards to the different factors?</p> <ul style="list-style-type: none"> <li>• Product attributes (Design of the vessel, equipment, functionality, fuel consumption)</li> <li>• Operability and safety</li> <li>• Crew and their qualifications</li> <li>• Environmental factors and HSE-measures</li> <li>• The company's renommé/Trademark</li> <li>• Previous purchases/experiences with the company</li> <li>• Additional factors suggested by the informant above</li> </ul> <p>What is the importance of buying equipment and vessels from equipment suppliers and shipyards in the cluster for shipping companies with regards to winning contracts in relation to the oil companies?</p> <p>Is there a clear difference between the different shipping companies with regards to quality?</p> <p>Is there an important difference between the actors with regards to who Remøy has been engaged with earlier versus does who Remøy has not been engaged with earlier?</p> <p>What is the importance of the cluster's renommé for Remøy in competition with actors situated outside the cluster?</p>
Ending	<p>Other issues that the informant wants to address</p> <p>Address the question related to confidentiality and other formalities</p> <p>Address the possibility for follow up question via mail or telephone</p> <p>Thank the informant</p>

## Appendix D: Request from shipyard to Brunvoll

From: Customer NN  
To: Brunvoll  
Date: 21.03.2014 00:10  
Subject: Offer for Thrustere E169 - Fallpipe, rock dumping Vessel

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Hei,

Vi jobber med et 'CUSTOMER NN - NAME OF PROJECT' prosjekt.

Vi ønsker tilbud på alle bow thrustere. Thruster kontroll blir levert av 'CUSTOMER NN' og el. motorer av verft.


Det som haster mest er teknisk spekk (helst i word), deretter pris.

Tilbudet skal omfatte igangkjøring osv. Det er en båt, med utstyr levering Q2 2015, Shanghai havn.

Vennligst gi tilbakemelding på mottatt mail.

BEST REGARDS

Appendix E: Extracts from chapter 1 yards specifications

	<b>YARD SPECIFICATION</b> <b>Chapter 1</b>			
	<b>E169</b>	<b>C.CS.0.01.01</b>	<b>Rev. I1</b>	<b>Page 23</b>

#### 10.6.7 LINES PLAN

The final lines plan to be made during the Technical Project stage in close concert with the DESIGNER and the OWNER.

#### 10.7 DESIGN CRITERIA

##### 10.7.1 ENVIRONMENTAL CONDITIONS

The following temperatures shall be considered for the design of the structure, HVAC and marine systems:


Description	Requirement
Max. Air temperature	+45 [°C] with 50% relative humidity or +40 [°C] with 70% relative humidity or +35 [°C] with 90% relative humidity
Min. Air temperature	- 20 [°C] with 0% relative humidity
Max Sea water Temperature	+36 [°C]
Min Sea water Temperature	-2 [°C]
Structural design temperature	-20 [°C]
Equipment design temperature	-10 [°C] on exposed decks 0 [°C] in areas protected by weather decks

Unless specified otherwise, all ratings as mentioned in this specification are based on these conditions. Deviations where necessary according to the respective manufacturers' requirements to be mutual agreed between the Purchaser and Contractor.

##### 10.7.2 FUEL AND OIL SPECIFICATIONS

Unless specified otherwise used oil to be of the following type:

- Fuel oil:
  - main diesel engines Heavy Fuel Oil 1)
  - thermal oil / steam boiler Heavy Fuel Oil 1)
  - auxiliary generator diesel engine Marine Gas Oil 2)
  - emergency generator diesel engine Marine Gas Oil 2)
  - Lubricating oil mineral oil type
  - Hydraulic oil mineral oil type
1. Heavy Fuel Oil according to ISO 8217:2010(E) with designation ISO-F-RMG 380.
  2. Marine Gas Oil according to ISO 8217:2010(E) with designation ISO-F-DMA.

	<b>YARD SPECIFICATION</b> <b>Chapter 1</b>			
	E169	C.CS.0.01.01	Rev. 11	Page 24

### 10.7.3 SAFETY IN DESIGN

Safety in Design method is to be followed during the entire design. During the engineering phase, depending on risk level, solutions need to be implemented to reduce the risks to a level that is acceptable. The evidence for this needs to be gathered in an Environmental HAZID/risk assessment document and in a Health and Safety HAZID/risk assessment document.

The safety management process is continuously part of the project. Throughout the design lifecycle, the hazards, arguments and evidence is to be recorded.

Basic design:

In the basic design phase, a detailed review of all safety aspects from the Concept Report is to be carried out. Arguments are to be formulated to back up all of the safety requirements and detail to be added to the safety requirements (HAZID, FMEA).


Activity	Purpose	Documents
Review safety aspect design will be used as starting point.	Concept report	Feedback from the Concept BoD, PEP
Develop Safety Requirements will be formulated.	Safety Requirements	Additional statutory requirements may be added to the list. High level safety requirements for individual systems will be formulated. BoD, PEP.
Basic design HAZID	Formal HAZID	Formal HAZID will be done for this design phase. Separate more detailed HAZID (HAZOP, FMEA) will be carried out for the equipment FMEA, HAZID, HAZOP
Construction HAZID	Construction hazards will be identified. The associated risk will be assessed and managed	FMEA, Structural report

Detail design:

In the detail design phase, all hazards need to be controlled (RCMs). The following hierarchy is used:

- Elimination of risk
- Substitution of risk
- Technical control measures
- Marking/warning and or administrative management measures
- PPE

Activity	Purpose	Documents
Review Safety Aspects as starting point.	Safety Aspects	Feedback from the Basic design will be used HAZID, FMEA and HAZOP
Finalize Safety Requirements	Safety Requirements	Detailed safety requirements, relevant to the build program will be added HAZID, FMEA and HAZOP

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Detailed design HAZID      Formal HAZID will be repeated at least once for the Detailed design. Hazards will also be identified by other means and added to the HAZID      HAZID Examination and testing      During construction, examination and testing will provide evidence that control measures covered the hazards      FAT

#### 10.7.4 MATERIALS

All materials as required for the construction of this vessel and all equipment to be installed will be new and of first class make and to have CE mark of approval (the Ships Steering Wheel) in accordance with MED

### 10.8 CLASSIFICATION, RULES & REGULATIONS, CERTIFICATES

#### 10.8.1 CLASSIFICATION


The vessel to be built under survey and to the requirements of BUREAU VERITAS with the following notations:

Class symbol	:	I
Construction mark	:	<input type="checkbox"/> HULL <input type="checkbox"/> MACH
Service notation	:	Special Service / Rock
Installation Ship	:	
Special Purpose Ships	:	SP60
Navigation notation	:	Unrestricted Navigation
Operating notation	:	GRABLOADING
Integrated ship systems	:	SYS-NEQ-1
Unattended machinery space	:	<input type="checkbox"/> AUT-UMS
Dynamic Positioning	:	<input type="checkbox"/> DYNPOS AM/AT RS
Equipment and Systems	:	GREEN PASSPORT
Pollution Prevention	:	CLEANSHIP, BWT
Vessels construction	:	ICE CLASS 1A
Cold weather condition	:	COLD DI
Comfort on board	:	COMF NOISE 1, COMF VIB 1
Inwater Survey Arrangements	:	INWATERSURVEY

#### 10.8.2 RULES AND REGULATIONS

The vessel to be built in compliance with the following rules and regulations in force and valid at the date of signing of the contract, or rules and regulations published but not in force on or before the date of signing of the contract but made valid for the vessel before the date of keel laying or before delivery:

1. Bureau Veritas Rules for Classification of Steel Vessels
2. Dutch Flag Administration rules.
3. The International Convention on Load Lines 1996 as amended
4. Internal Code on Intact Stability 2008 (2008 IS Code)

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**11.2.4 STORAGE OF PURCHASER'S DELIVERIES**

The Contractor to, without extra payment, unload Purchaser's stores and loose equipment upon arrival at the Contractor's shipyard, and store these stores and loose equipment in a properly conditioned confined store according to the manufacturer's instructions, which can be locked. The key from this store to be kept by Contractor's storekeeper.

**11.3 MAKERS**

**11.3.1 MAKERS LIST**

The supplier's list in this specification is final and shall be regarded as an approved list of manufactures and subcontractors of major machinery and equipment to be purchased.

Other suppliers may be chosen after a written agreement between the Purchaser and the Contractor

The Contractor has the right to choose the most favourable maker from the list, with regard to price, delivery, etc. insofar this equipment is in accordance with the specification. However, all main components to be approved by the Purchaser whose approval shall not be unreasonably withhold.


Before a final decision about makers, the Purchaser to be informed about the Contractor's proposal. The Purchaser may approve this, or, against price adjustment, choose another maker.

Where the specification mentions the name of a maker, this maker is to be chosen for the equipment. Makers instructions for fitting and the recommendations to be adhered to as far as is practical.

**11.4 FEES AND GENERAL EXPENSES**

**11.4.1 FEES TO CLASSIFICATION SOCIETY, AUTHORITIES, ETC.**

Fees to the Classification Society and all relevant institutions in connection with the construction of the vessel to be paid by the Contractor, except fees concerning purchaser's deliveries.

	<b>YARD SPECIFICATION</b> <b>Chapter 4</b>			
	E169	C.CS.0.01.01	Rev. 11	Page 8

**40      MANOEUVRING MACHINERY AND EQUIPMENT**

**40.4      BOW TUNNEL THRUSTERS**

**40.4.1      BOW TUNNEL THRUSTERS**

Two (2) off 1500 [kW] electrically driven bow thruster units with variable pitch propeller must be provided.

Each unit is of the well mounted type which allows retracting the thruster unit without dry-docking. In that case the vessel is empty (i.e. with 10% consumables and no rocks).

A bolted hatch cover is provided for sealing when one of the bow thruster units is dismantled.

Sufficient hoisting eyes of ample capacity are provided in the bow thruster room, to dismount and install each bow thruster unit.

Each unit has the following specification:

- Input power                      1500 [kW] - continuous
- Input speed                      0 - 1480 [rpm]; both directions
- Reduction ratio about        5
- Propeller diameter            2400 [mm]

Each unit consists mainly of the following parts:

- A steel tunnel section with trunk including a flange and a sealing  
The tunnel section is complete with foundation on top for vertical mounting of an electric motor.

A stainless steel ring is welded in the tunnel in way of the propeller area.

- Nickel-Aluminium bronze propeller
- streamlined bevel gearbox
- flexible coupling
- for control, see item ....
- speed indicator in:
- navigation control console

For electric motors, see Section .....

**40.4.2      BOW TUNNEL THRUSTER DRIVES**

2 pcs. bow thruster drives are installed. Each bow thruster drive is consisting of an electric motor, a frequency converter and a transformer, with the following specifications:



To: Potential bidders

22 MAY 2013

## **'NAME OF CONTRACTOR'**

# **INVITATION TO TENDER FOR VESSEL TO SUPPORT NAME OF CONTRACTOR'S OPERATIONS ON BEHALF OF 'NAME OF OIL COMPANY 1' AND 'NAME OF OIL COMPANY 2'**

### **INTRODUCTION**

The purpose of this "Invitation To Tender" is to secure "NAME OF CONTRACTOR"s clients with vessel to support the operations with jack-up "NAME".

### **SCOPE OF WORK**

The bulk of the work scope will be to support the "NAME" project, but the intention is to use this contract if other project opportunities arise during the course of the contract period.

### **VESSEL TYPE**

- Platform Supply Vessel:
- Deck area: 700 m2 or larger
  - DP II

### **REQUIREMENTS**

<b>Commencement:</b>	Window between 25.07.2013 and 01.10.2013
<b>Notice of delivery:</b>	<i>Charterer to nominate a 14 day window for the onhire date 30 days in advance. Charterer to give 14 day notice of a 7 day window thereafter 5 days actual notice of delivery within the last 7 days delivery spread.</i>
<b>Delivery/redelivery:</b>	Tananger / Tananger

<b>Period:</b>	2 wells firm: 1 <sup>st</sup> well is for "NAME OF OIL COMPANY 1" ASA and the 2 <sup>nd</sup> is for "NAME OF OIL COMPANY 2"
<b>Scope of work:</b>	Provide services as required by Charterer within the vessels safe/intended capacities and capabilities.
<b>Crewing:</b>	The Vessel is to be crewed for 24/7 DP operations. Crewing and qualifications shall be in accordance with class authority and the NWEA guidelines.
<b>Charter party:</b>	As per the two attached modified BIMCO "Supplytime 2005"
<b>Commission:</b>	All commercial terms include 1.25% commission payable to "BROKER".

### **TENDER INSTRUCTION:**

This tender consists of the following documents:

- This invitation letter with instructions and scope of work
- Excel spreadsheet for technical and commercial offer
- Charter parties

**Bid deadline:** Offers must be received within 1200 hrs (Norwegian time) 04.06.2013. Offers not received by this deadline may not be considered.

The Tenderer shall be solely responsible for ensuring that its Tender is delivered in time.

The contract will be awarded to the Tenderer, whom is evaluated to have the most favorable tender. Charterer reserves the right, but has no obligation to negotiate with participating tenderer.

**Tender enquiries:** Single points of contact for all questions and clarifications related to this enquiry are:

[firstname.lastname@broker.com](mailto:firstname.lastname@broker.com)/[firstname.lastname@broker.com](mailto:firstname.lastname@broker.com)

Bids can only be submitted from the ship manager / owner through "Broker". No other parties can be given access to this ITT. Breach of these instructions may disqualify the bidder.

**Tender submission:** Tenderer should complete the attached forms and submit them together with attachments within tender deadline to:

[firstname.lastname@broker.com](mailto:firstname.lastname@broker.com)/[firstname.lastname@broker.com](mailto:firstname.lastname@broker.com)

<b>Validity of offer:</b>	The offer submitted must be kept open for acceptance for 60 days from the bid due date.
<b>Tender costs:</b>	Any costs incurred by Tenderer in preparing the tender shall be carried in full by the Tenderer who shall have no recourse to Charterer or broker in this respect.
<b>Contract:</b>	The services shall be performed in accordance with the terms and conditions of the Charter Parties attached to this bid package, which are modified BIMCO "Supplytime 2005". Any qualifications to the Charter Parties must be stated in the relevant section. Comments after the tender has closed will not be considered. Simply offering a mutually agreeable Charter Party to be qualified at a later date may be considered grounds for disqualification.
<b>Form of tender:</b>	The tender shall be submitted using the forms provided attached, which shall not be altered in any way and will be supplemented by all other information requested in the tender documents.

Below documents should also be provided:

- Attachments as per technical schedule spreadsheet  
Vessel specification, photos, GA plan, tank plan and copy of most recent CMID / OVID
- Crew list and crew qualifications.
- Safety statistics for the company and offered vessel(s) for the last 3 years
- Any other documentation that the bidder believe to be relevant for the offer.

## Appendix H: Example of Statoil tender

<b>Notes to the specifications below</b>	
Minimum	Minimum requirement in order to be evaluated
Optimum	Preferable to Statoil - may be rewarded

<b>Statoil PSV requirement 2014</b>			
<b>Subject</b>	<b>Minimum requirement</b>	<b>Optimum requirement</b>	<b>Shipowner to fill in value</b>
Name of vessel	info		Rem Stadt
Vessel complete specification to be attached	info		Attached
<b>1. Commercial information</b>			
Owner and Owner's Address	info		Rem Stadt AS, Vaagsgata 15, 6090 Fosnavaag, Norway
Management company, if any.	info		Remøy Shipping AS
Receiver of payment	info		Rem Stadt AS
Date Range of Delivery	01.03.2014 - 31.05.2014		In direct continuation of current charter with Statoil 13.04.2014
Place of delivery	Preferred Bergen		Bergen
Place or redelivery	Preferred Bergen		Bergen
Charter Period : 3 months firm + 3x1 month options			3 months firm + 3x1 month options
Notice for Optional Extended Period(s)	14 days		14 days
Trading Limits	North European Trade and the Barents region		North European Trade and the Barents region
<b>Day rate</b>	NOK		<b>NOK 189.000,-</b>
Additional crew	NOK		DPO NOK 3.800./ AB NOK 3.200,-
Passengers	NOK		NOK 600,-
Terms	Statoil Time Charter Party 2010 Rev. 03		
<b>2. Class Notation according to DNV or equal class society</b>			
DP2 (DYNPOS AUTR)	Compliance	Compliance incl: 2 x DGPS and CyScan/FanBeam and RADIUS	Compliance
HL	2,5		2,5 t/m3
DK(+)	5 ton/m2	Part of deck - 10 ton/m2	Compliance
NAUT OSV	NA	Compliance	N/A
COMF-V(3) C(3)	NA	Comf(V3)(C3)	N/A
Clean class / design	NA	Clean Design	N/A
LFL*	NA	Compliance	Compliance
Rescue Class NMD	NA	RESCUE CLASS NMD (Numbers of survivors 150) vessel must be equipped with 2 FRC's or 1 FRC with technical redundancy	NA
<b>3. Propulsion, Machinery and sea performance</b>			
Engine Output	info		2 x 3235 KW = 6470 KW
Number of Bow Thrusters (Specify if Azimuth Bow Thruster)	info		2 ( 1 tunnel and 1 azimuth)
Total Bow Thruster capacity	info		1764 KW
Number of Stern Thrusters	info		2
Type of Stern thrusters	info		tunnel
Total Stern Thruster Capacity	info		1472 KW
In a worst single failure mode, the vessel shall have sufficient power capacity to safely maintain position and abort operation in:  Wind: 35 knots Wave height 4 m Hs Wave period: 10 s Current: 1,5 knots Vessel heading on wind: 30 degrees	Compliance		Compliance
<b>4. Deck cargo capacities</b>			
Deck area covered by wood (net effective area for loading) documentation to be provided	800m2	1000m2	1015 m2
Snagging points in the vicinity of cargo deck to be protected	Compliance		compliance
Power supply for fridge (30%) and freezer (70%) outlet 1 phase, 230 Volts, 50/60 Hz, 16 A fuse slow Plug product "Ceag" Ex, push / twist GHG 511 7306 R0001	6 pcs	24 pcs	28 pcs
Rescue equipment such as life rafts or MOB boats and vessels crane, should be mounted clear of lifting sector for offshore crane around cargo deck area	Compliance		compliance
<b>5. Tank Capacities</b>			
Mud capacity	600 m3		960 m3
Agitator	Installed all mud tanks		Installed all mud tanks
Brine capacity	200 m3		480 m3

Agitator	NA	Installed all brine tanks	In the two combi tanks
Segregations	Handling of mud & brine simultaneously, double segregation		Compliance
Tank cleaning	Mud tanks	Mud & Brine tanks	Mud & Brine tanks
Fuel oil capacity for delivering in dedicated tanks	600 m3		1505 m3
Diesel measurements within + - 1%	Compliance		Compliance
FW capacity for delivery to installation (pot water) dedicated tanks	500 m3		992
Drill water	500 m3		1887 m3
Base Oil (can use special product tanks if tanks/pumps arranged for it)	NA	100 m3	274,6 m3
Dry bulk (dedicated tanks)	200 m3		400 m3
Segregations	2 separate systems		2 separate systems
Slop tank for tank cleaning (dedicated)	NA	50m3	2 tanks
Gas monitoring system (slop tank, mud tanks and pump room)	NA	Compliance	N/A
Bulk hose stopper at cargo rail and anti slip coating or similar - all stations	Compliance		Compliance
NLS Certificate to be enclosed in tender document	Compliance		Compliance
<b>6. Fuel Consumption</b>			
<b>Specify Fuel consumption:</b>			
<b>a) Sailing speed and consumption</b>			
Max Service Speed (min. 85% load)	Specify speed in knots		13 kts
Fuel consumption for speed as listed above	Specify in format m3/24H		26 m3
Economical speed (minimum 11 knots)	Specify speed in knots		11 kts
Fuel consumption for speed as listed above	Specify in format m3/24H		11 m3
Note: The speed and consumption data are to reflect a weather and sea condition with significant wave height of 1,5 meters ± 0,3 m and the average value of head/tail seas. Please estimate figures with 40 % DWT.	Confirm fuel figures according this		Confirm
<b>b) Vessel on field</b>			
DP- operations (crane operations)	Specify consumption in m3/24H		8 m3
Stand-by at field (waiting for platform outside 500m)	Specify consumption in m3/24H		5 m3
Note: The consumption data are to reflect a weather and sea condition with significant wave height of 1,5 meters ± 0,3 m and the average value of head/tail seas. Please estimate figures with 40 % DWT.	Confirm fuel figures according this		confirm
<b>c) In port</b>			
Stand-by in port, no cargo operations	Specify consumption in m3/24H		1,5 m3
<b>7. Emissions</b>			
Nox-emissions	Specify (g Nox/kWh)		63,31 g/Kg
SCR or similar/ other system to reduce emissions in place - Please specify	NA	IMO Tier 3	n/a
<b>8. Communication</b>			
Internal	4 sets of portable UHF units (Hands free) and 1 fixed UHF in wheelhouse and 1 fixed in eng. control rom. All UHFs to be pre-programmed with Statoil's frequencies, and updated when requested by charterer *		Confirm
	*See also <a href="http://www.nwea.info/statoil.asp?id=938">http://www.nwea.info/statoil.asp?id=938</a>		
External	internet, E-mail, V-Sat / Norwegian Cell phone		Internet / Norwegian Cell phone
Internet continuous capacity (both in and out)	256Kbit/s		Confirm
<b>9. Crew</b>			
Crew-list with crew-qualifications to be attached with all offers in accordance with NWEA Guidelines.	Bridge: 3 officers + captain (Minimum 2 officers including captain to hold DP-A. Remaining officers to hold minimum DP-Basic.  Deck: 4 Abs (with slinger course)  Engine: Chief Engineer + 2 engineers		Confirm  Confirm Confirm
Language	Scandinavian and English speaking		Scandinavian
Pilot exemption certificate for 24 hours operations	NA	Pilot exemption certificate, Stavanger - Kristiansund	Lindesnes - Norkapp - both shifts
<b>10. Inspection/design verification</b>			
	All fixtures to be to subject to Statoil Standard		

## Supplier Declaration Guide

Statoil's suppliers shall be made aware of Statoil's principles for Corporate Integrity and Social Responsibility (CISR).

Hence, Statoil has prepared a Supplier Declaration reflecting our CISR principles. The intention of this declaration is to increase awareness and improve transparency of CISR in the supply chain.

Enclosed please find the Supplier Declaration, which you as a potential supplier to Statoil are requested to sign. By signing this document, you confirm that you fulfil the requirements in the Supplier Declaration. To the extent you are not able, upon our request, to provide supporting documentation with respect to fulfillment of the requirements, you confirm your willingness to start a process of documenting your promotion and performance.

## Supplier Declaration

### Compliance with Laws

As a supplier to Statoil we will comply with all applicable laws and regulations.

### Improper Payments

As a supplier to Statoil we will not, in order to obtain or retain business or any advantage in the conduct of business, offer, promise or give any improper advantage to a public official (or a third party) to make the official act or refrain from acting in relation to the performance of her/his official duties. This applies regardless whether the advantage is offered directly or through an intermediary.

### Gifts, Hospitality and Expenses

As a supplier to Statoil we will not offer, directly or indirectly, to Statoil employees or representatives or anyone closely related to them gifts except for promotional items of minimal value normally bearing a company logo.

Hospitality such as social events, meals or entertainment may be offered if there is a clear business reason, but the cost must be kept within reasonable limits. Travel, accommodation and other expenses for the individual representing Statoil will always be paid by Statoil.

Hospitality, expenses, gifts or other favours shall not be offered or received in situations of contract bidding, evaluation or award.

### Conflict of Interest

As a supplier to Statoil we, and our employees, will not take part in or seek to influence any decision under circumstances that can give rise to an actual or perceived conflict of interest. Such circumstances may be a business interest or a personal interest in

### Minority Rights

As a supplier to Statoil, we recognize and shall respect the special importance of the social, cultural, religious and spiritual values and practices of the indigenous and tribal peoples and their relationship with the land or territories. To the extent our work may affect indigenous peoples, a process to minimize and manage such impacts will be undertaken.

### Security Resources

As a supplier to Statoil, we will observe strict requirements for the selection of security contractors to avoid human rights risks in countries where security firms are not properly regulated.

### Environment

As a supplier to Statoil we will work according to internationally recognized environmental management principles and aim for continuous improvement. We will comply with national environmental legislation and discharge permits. We will work to achieve energy efficiency and minimize harmful discharge, emissions, and waste production in a lifecycle perspective.

### Minimum Age of Labour

As a supplier to Statoil we shall not employ children below the age of 15. If the child is secured the right for education, play, rest and family life, limited exceptions may be made if this is clearly in the best interests of the child.

### Forced Labour

As a supplier to Statoil we will not engage or employ people against their own free will, nor will personnel be required to lodge 'deposits' or identity papers upon commencing employment.

### Freedom of Association & Right to collective Bargaining

As a supplier to Statoil we recognise that our employees are entitled to be - or refrain from being - union members and to be represented in collective bargaining agreements. In countries where these rights are restricted our employees will anyway have the right to influence their work situation.

### Working Hours

As a supplier to Statoil we will comply with local law or agreements regarding working hours.

### Wages

As a supplier to Statoil we will ensure that wages paid to employees and hired labour are considered fair.

### Employment Practices

As a supplier to Statoil we will treat our employees equally and fairly. We will not accept any form of harassment or discrimination.

### Health and Safety

As a supplier to Statoil we will work ambitiously, through continuous improvement, for a healthy work environment and safe and secure conduct according to internationally recognized health and safety management principles and practices and applicable law.

### Selection of Business Partners, Agents and other Intermediaries

As a supplier to Statoil we will promote that potential business partners, agents and intermediaries adopt the principles set forth in this Supplier Declaration.

### Standards towards own Suppliers

As a supplier to Statoil we will promote the implementation of the principles set forth in this Supplier Declaration towards own suppliers.

**Statoil**  
**Vessel Time Charter Party**  
**Part I**

This Charter Party (hereinafter referred to as "Charter") is made the <x between Statoil Petroleum AS, acting in its capacities as operator for and on behalf of the other participants in the licences where the Vessel performs its duties under this Charter, (hereinafter referred to as "Charterer") of the one part and <COMPANYNAME (hereinafter referred to as "Owner") of the other part, and shall be performed in accordance with the terms and conditions set forth in Part I and Part II hereof, including Appendix A, B and C hereto.

In the event of any conflict between the provisions of the contract documents, Part I shall prevail, followed by Part II and the Appendices in the order as they are listed above.

Signed for and on behalf of the parties hereto:

For Owner:

For Charterer:

By:

By:

\_\_\_\_\_  
Name:

\_\_\_\_\_  
Name:

\_\_\_\_\_  
Title:

\_\_\_\_\_  
Title:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Date:

\_\_\_\_\_

\_\_\_\_\_

<b>1. Place and date</b>	
<b>2. Owner and Owner's Address</b>	<b>3. Charterer's Address</b>
<b>4. Vessel's name</b>	<b>5. Date Range of Delivery</b>
<b>6. Port or Place of Delivery</b>	<b>7. Port or Place of Redelivery</b>
	<b>7B. Cancelling date</b>
<b>8. Charter Period</b>	<b>9. Optional Extended Period(s)</b>
	in favour of the Charterer
<b>10. Notice for Optional Extended Period(s)</b>	<b>11. Employment of Vessel</b>
xx days/months prior to Charter expiry.	Within the Vessels natural capacities/capabilities
<b>12. Trading Limits</b>	<b>13. Charterhire</b>
Valid Trading Limits under this Charter is the marked alternative: <input type="checkbox"/> World Wide Trade <input type="checkbox"/> North European Trade and the Barents region <input type="checkbox"/> North European Trade	Total Charterhire:  Hereof: Finance proportion
<b>14. Rates for additional crew</b>	<b>15. Rates for Passengers</b>
Mate:  AB:	
<b>16. Subject to Rate Escalation</b>	<b>17. Agreed date for Escalation</b>
Yes/No	According to Statoil Vessel Time Charter Party, Part II, Clause 24.
<b>18. Additional Articles</b>	