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## MASTER'S THESIS

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# Abstract

A written contract is an important part of the project. It defines the agreement and contributes to clarity on what is agreed so that misunderstandings can be avoided. It creates predictability so that the parties have the necessary confidence in how a legal relationship should work between them. However, a contract not only provides duties, responsibilities and sanctions, but is also an important tool for cooperation. This applies in particular when it comes to the form of communication and deadlines for different messages between the parties, and their legal effects. A contract also enables the parties to control risk.

A written contract regulates who the contracting party is, what the agreement applies and does not apply to, what terms the agreement is based on, rights and obligations, deadlines, who represents the parties, how the communication should be, what defines a breach of contract, how breach of contract is sanctioned, how disputes should be handled, and when and how the agreement ceases.

A company can choose to enter into several service contracts, which was a common practice in the past, or sign a so-called total contract, which is becoming more common now in recent times. The purpose of this thesis is to look at the differences and assess the benefits of signing a total contract with one service company rather than several smaller service contracts.

The master thesis will be based on the Frame Contract (Contract), entered into on 03.07.2015 between Statoil Petroleum AS on behalf of the participants in the Licence Group (Company) and Baker Hughes Norge AS (Contractor). This contract will be compared to Master Service and Supply Agreement ("Agreement"), entered into on 28.08.2008 between StatoilHydro ASA (Company) and Baker Hughes Norge AS (Contractor).

# Abbreviations and acronyms

Abbreviations and acronyms used in this thesis are listed below.

<b>BHGE</b>	Baker Hughes, a GE company
<b>ICT</b>	Information and Communication Technology
<b>GDP</b>	Gross domestic product
<b>HSE</b>	Health, safety and environment
<b>KPI</b>	Key performance indicator
<b>NCF</b>	Norwegian continental shelf
<b>NTK</b>	Norwegian Total Contract (Norsk totalkontrakt)
<b>TDM</b>	Total Delivery Model

# Terminology

Some of the central terminology used in this report is further described below.

<b>Agent</b>	The party that sells a service or a certain commodity in a contractual relationship.  Also known as “contractor”.
<b>Client</b>	The party that buys a service or a certain commodity in a contractual relationship.  Also known as “principal”.
<b>Company</b>	In this thesis: When written with a capital C, the Company refers to Equinor ASA. If not, it denotes any company.
<b>Contract Object</b>	Equipment or material purchased, or to be purchased by Company from Contractor.
<b>Contractor</b>	The party that sells a service or a certain commodity in a contractual relationship.  In this thesis: When written with a capital letter, C, the Contractor refers to the Service Company.
<b>Delivery Protocol</b>	A document to be concluded by both parties upon delivery of the Contract Object.
<b>Field operator</b>	A company which is responsible for developing and producing petroleum from a reservoir.  Also known as “operator”.
<b>Force Majeure</b>	An occurrence beyond the control of the party affected, provided that such party could not reasonably have foreseen such occurrence at the time of entering into the Contract and could not reasonably have avoided or overcome it or its consequences.
<b>Principal</b>	The party that buys a service or a certain commodity in a contractual relationship.  Also known as “client”.

<b>Purchase Order</b>	The documents or electronic orders issued by Company to initiate Work.
<b>Service Company</b>	<p>The party that sells a service or a certain commodity in a contractual relationship.</p> <p>In this thesis: When written with capital letters S and C, the Service Company, refers to the actual Service Company, Baker Hughes Norge AS. Otherwise it refers to any service company in the industry.</p>
<b>Work</b>	<p>In this thesis: When written with a capital letter, W, the Work, refers to Services and Contract Object to be provided by Contractor in accordance with the Contract.</p>

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# Preface

This thesis is the last work of my two-year Master's degree in Industrial Economics at the University of Stavanger. My specializations have been contract administration and risk management, and I have a Bachelor's degree in petroleum engineering. Before I started to work on my thesis, my goal was to find a topic that could cover most of my study fields.

I previously had quite limited experience with contracts. Writing this thesis and studying such an important and interesting topic was both a challenge and a good learning opportunity. I am confident that I can use the information and knowledge I have acquired when I start working after my graduation.

Although this report was written by me alone, a few have helped me during this journey, and deserve praise for their support.

First of all, many thanks to all the employees at Baker Hughes who have given me the opportunity to write this thesis, provided me with information, helped and supported me. I would also like to give a special thanks to my supervisors at Baker Hughes, Jørgen Solvang and Ole Georg Røyland. They helped me get started with the thesis, and have provided me with information of utter necessity. This has been very valuable to me.

Also, thank you to my faculty supervisor, Kjell Hauge, for his excellent input and guidance during this work.

Maria Eriksen

11.06.2019

# 1 Introduction

This chapter presents the formulation of the thesis problem and the justification for writing this thesis. The first sub-sections will give some background information on the topic, and the following sub-chapters will provide important information that will help the reader to get a better understanding of the work behind this thesis.

## 1.1 Background

The petroleum industry is a very advanced field of study; it includes many various disciplines, such as advanced technical engineering, logistics, and business management.

In Norway, the petroleum industry has a huge significance for the country; it stands for 43% of the country's total export, and accounted for 17% of the GDP in 2018. 170,200 people were employed in this industry alone in 2017. (Norsk Petroleum (1), 2019).

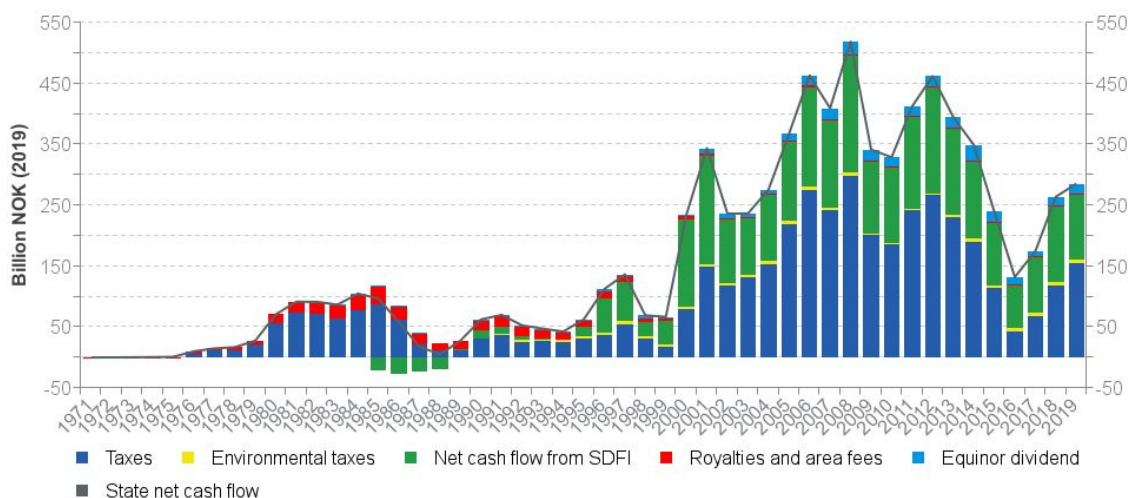


Figure 1: The net government cash flow from petroleum activities, 1971-2019 (Norsk Petroleum (2), 2019)

As we can see from figure 1, the petroleum industry experienced a sharp decline in the middle of 2010s, and was set upon as a “sunset” industry. Norway is now trying to find other possible sources of income, but it will take several years before other industries will be able to take the place of the oil business. Moreover, there are some great reasons to believe that in the coming years there will be an upswing for petroleum. One of those great reasons is the development of the Johan Sverdrup oil field.

The oil field “Johan Sverdrup” is located in the North Sea, approximately 140 km west of Stavanger, and was discovered in 2010. (Norsk Petroleum (2), 2019) It is expected to be one of the largest ever oil fields on the Norwegian Continental Shelf (NCS), with estimated resources between 2.1 - 3.1 billion barrels of oil equivalents. (Equinor (1), 2019) The field is still under development, and production is planned to start at the end of 2019. (Norsk Petroleum (2), 2019)

Johan Sverdrup is operated by Equinor ASA (formerly Statoil and StatoilHydro). The company signed an integrated service contract in 2015 with Baker Hughes, a GE company (BHGE) for the first phase of the development of the field. BHGE have supported several of Equinor’s operations on the NCS in the past, but the contract form has been different. Previously, the companies signed smaller contracts with several contractors. However, it is believed that a new large contract with different conditions will significantly increase operational efficiency and reduce costs over the lifetime of the project.

## 1.2 Statement of hypothesis

The thesis is based on the following hypothesis, H1:

“An integrated contract is the best solution for both parties, Contractor and Company”.

Given hypothesis H1, the corresponding null hypothesis H0 will be:

“An integrated contract is not the best solution for both parties”.

## 1.3 Research questions

It may be difficult to formulate an objective answer for the hypotheses presented in the previous paragraph. The reason for this is that "best solution" is a subjective assessment.

However, in order to achieve a clear answer, the following research questions will be formulated:

1. Which advantages and disadvantages occurred for the contractor in the new contract form?
2. Which advantages and disadvantages occurred for the principal in the new contract form?

These questions will be answered in this thesis.

## 1.4 Objective

The objective of this thesis is to review and examine the two service contracts between the principal Equinor and the contractor BHGE. After identifying the differences, it will also be considered which consequences this entails for the parties.

## 1.5 Selection of methods

In order to obtain a precise answer to the hypotheses and the research questions, a number of methods will be used. The master thesis contains theory about contracts; this information will be collected mainly from books, publications and newspaper articles. Two different contracts will be compared with each other in order to more easily detect differences between the two contract types; in addition, they will be compared to the accompanying templates available online. Finally, the employees at BHGE, who work on contracts, will be interviewed.

## 1.6 Scope of the report

The scope of this thesis is limited to the assessment of two selected contracts between Equinor and BHGE. It could also be informative and interesting to analyse multiple contracts, but it is difficult due to the limitations of available resources and time. Focusing the thesis on the two contract types will narrow down the topic of contract administration, which will keep it interesting without restricting it too much.

## 1.7 About the Company and the Contractor

Equinor ASA (previously - Statoil ASA (2009-2018), StatoilHydro (2007-2009)) is the Norwegian International Energy Company. It was founded in 1972 by decision of the Norwegian Parliament (Storting) as a private state-owned company. The name is derived from the English "State's oil" (state oil). In 2002 the company was transformed into a public one and partially privatized. The headquarters are in Stavanger, Norway. (Equinor (2), 2019)

Baker Hughes, a GE company is the third largest oil and gas service company in the world, after Schlumberger and Halliburton, and is the world's first and only full stream supplier of integrated oilfield services, products and digital solutions. The company's services include drilling, reserves, and field development. The company operates in more than 120 countries around the world. It was formed by the merger of Baker International and the Hughes Tool Company in 1987. The headquarters of the combined company is in Houston, Texas. (BHGE, 2019)

## 1.8 Structure of the report

This thesis is divided into 7 chapters:

- **Chapter 1: Introduction** contains an introduction with background information, the objective of the thesis and a disposition;

- **Chapter 2: Theory** presents relevant theory about contracts;
  
- **Chapter 3: Method** contains descriptions of methodological approaches, as well as a reasoning behind the choice of methods;
  
- **Chapter 4: Analysis** contains a description and analysis of the two contracts that were compared during the study, and presents the results;
  
- **Chapter 5: Discussion** discusses the results of Chapter 4 and compares the two contracts; in addition, the issues and uncertainties associated with them are discussed;
  
- **Chapter 6: Conclusion** provides a conclusion of the thesis and suggests topics for future work;
  
- **Chapter 7: References** contains references that were used during the thesis writing;

## 2 Theory

Contract theory is a broad and complex field of study, which consists of several other fields of study, such as jurisprudence and economy. It is difficult to cover and reflect over all of the topics of contract theory, and some of this theory will not be relevant for the objective of this thesis. This chapter will present some theory about contracts, including procurement and compensation formats. At the end of this chapter, there is an overview of contracts in the petroleum industry (Dimitri, Piga, Spagnolo, 2006).

Contracts are mainly signed between two parties. The first party is the one requesting a commodity or a service, and is called the client or principal. The second party is the one providing the requested commodity or service, and is called the agent or contractor. In some cases, there are more parties that take an interest in the contract, known as the stakeholders; government, unions and subcontractors are just a few examples of possible stakeholders in a contract. In other cases, the principal or the contractor (or both) might be a part of a cooperation or a union. (Maskin, Tirole, 1992) All of these factors will affect the deposition of the contract, and this is the main reason why there are so many varieties of different contracts.

Norwegian law authorizes the parties to compose a contract as they want (Jusleksikon, 2017); however, there are a lot of standard contract formats which are used by different industries, so that the contracts within the same industry are often quite similar. The contracts that are studied in this thesis are from the petroleum industry, and the theory will therefore focus mainly on the contracts in the petroleum industry.

The following sub-chapter, *2.1 Procurement*, may be set upon as a foundation for a contractual relationship between the parties, and *2.2 Compensation format* will be relevant for the discussion in this thesis.

## 2.1 Procurement

Procurement can be defined as a process of getting needed or requested commodities or services from another party, which can provide these commodities or services. The main purpose is to get the best product at the lowest cost whilst complying with the requirements and laws, such as guaranteeing a competitive market for all possible providers. It is therefore important to develop proper strategies and be open for possible compromises to achieve the goal.

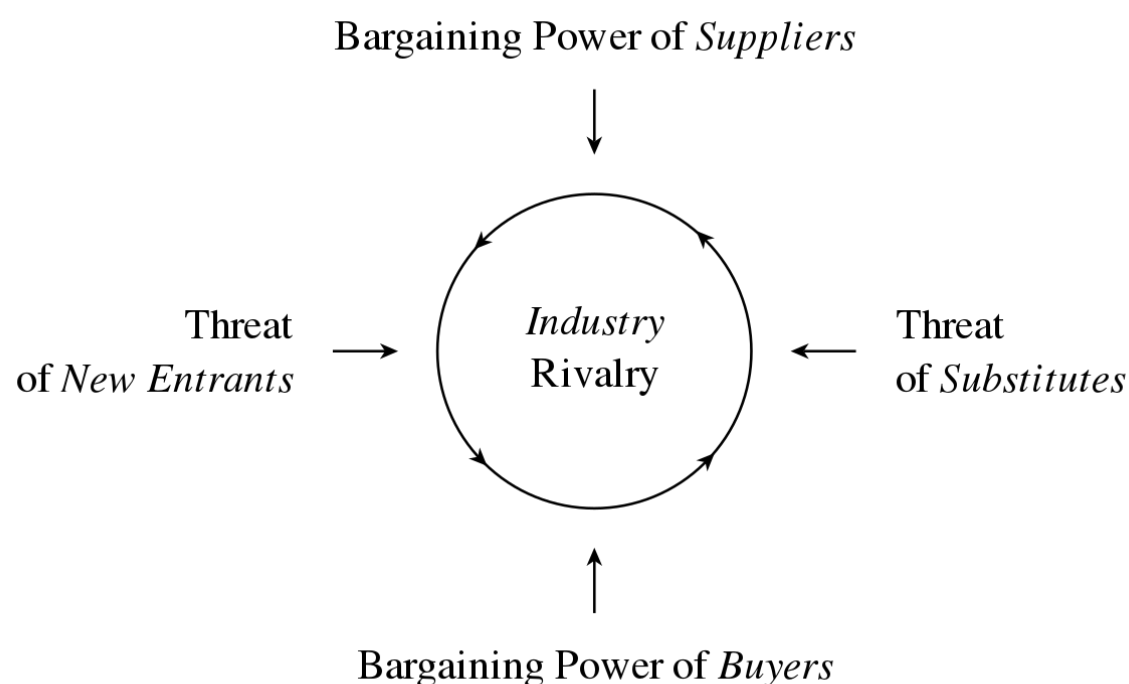
The development of the procurement strategy starts with setting the goal for the procurement, verification of the demand and analysing the supplier market. The goal doesn't have to be precise at this initial stage of the planning; on the contrary, if the goal is too precise, it might pin down unnecessary constraints on the further stages of the process. By performing demand verification, the procurer can identify if the procurement is needed, or can be avoided by, for example, eliminating this demand. It is therefore important to understand why the need occurred, and how the market of suppliers can solve this demand. The purpose behind the analyses of the market is to collect important information in order to find possible suppliers, as well as considering possible opportunities and risks with the procurement. (Bruvoll, 2018)

The next step is specification of the deliverable. This specification will affect the future contractor's ability to deliver the commodity or service; sometimes, depending on the delivery, it may be useful to give the contractor freedom to solve the given task creatively, while at other times it is better to do the opposite. The level of the specification should be based on the delivery itself, experience and competence of the contractor, importance, price, complexity, etc. Once specification is done, the procurer may start to choose a preferable contract model. (Bruvoll, 2018)

All of the actions above will form the basis for the analyses of the market. The method which is often used to perform such analyses are Porter's Five Forces. The goal of these analyses is to evaluate the forces that are affecting the market (industry). These five forces are: (Bruvoll, 2018)



1. Rivalry within the established market
2. The threat of substitute products or services
3. The threat of new entrants (companies which are entering the market or the industry)
4. Supplier power
5. Customer power



*Figure 2: Porter's Five Forces (Porter, 2008)*

Kraljic's portfolio management method can be used to evaluate strategic importance of the current procurement and, additionally, how to trade with suppliers. In this method, the procurer is using the Kraljic's matrix (which is a 2x2 matrix, as shown in Figure 3). The procurer has to place the procurement into this matrix, depending on the importance of the procurement (along the vertical axis) and the complexity of the supply (along the horizontal axis). When the position of the procurement in the matrix is set, the procurer will know how to deal with the contractors.

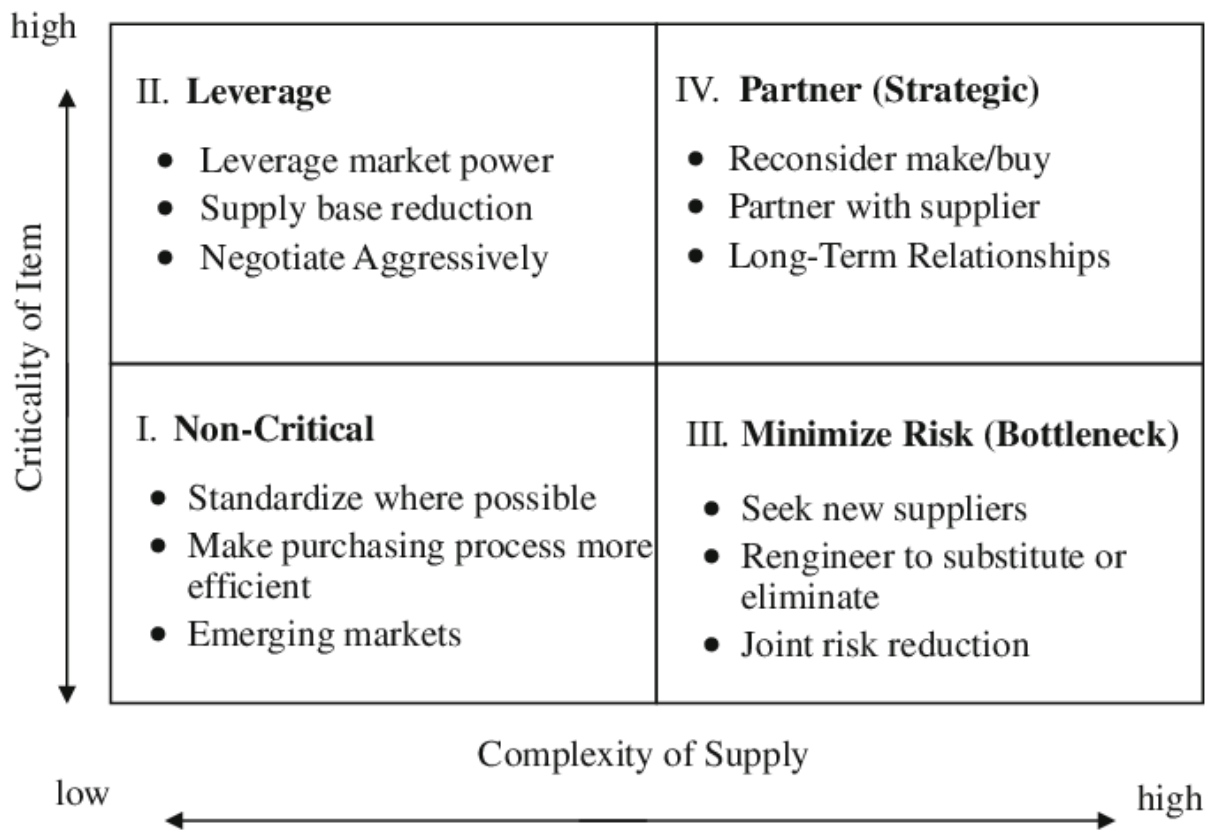


Figure 3: Kraljic's matrix (Kraljic, 1986)

According to Kraljic's Matrix, the best strategy for non-critical deliverables is to find the best deal on the market, and try to reduce the price. Leverage deliverables have more importance for the procurer, and deserve therefore more attention rather than the first category. Since the deliverable is not complex, the procurer can find a lot of options on the market, so the best strategy will be to apply the buying power. Bottleneck deliverables are complex, but less important for the procurer. The best strategy in this case is to ensure the supply and continue to look for a better deal on the market; there may only be a few suppliers on the market for this deliverable, since it is complex. Lastly, when the deliverable is both complex and important, the procurer should try to make an alliance with a supplier, in order to ensure the stability of the contribution. (Bruvoll, 2018)

All of the actions that were described in this subchapter will help the procurer to identify the critical factors of the procurement, and, based on these factors, create a strategy that will ensure a successful fulfillment of it.

## 2.2 Compensation formats

Compensation is one of the most important parts of any contract. The choice of the compensation format is usually based on the deliverables of the contract or on the complexity of the task. In general, there are three main compensation formats, which are (Dimitri, Piga, Spagnolo, 2006):

- ★ **Fixed price.** Contractor bears most of the risk in this compensation format - contractor will not receive any additional compensation, and there is a risk that expenses will be higher than incomes. Contractor will therefore try to reduce the costs in order to obtain a higher profit, and this may affect the quality of the deliverables. In addition to this, this compensation format is not flexible to the changes and variations of the deliverables. Therefore, this compensation format is most suitable for the contracts where there is low risk of changes in both the deliverables and the cost of production.
  
- ★ **Cost reimbursement.** Client bears most of the risk in this compensation format, since the contractor is reimbursed for all expenses regarding the contracting deliverables. This means that the agent is protected against cost overruns; this may lead to high expenses for the client, since the contractor is not interested in performing any cost-reduction actions. However, in most cases, the contracts with this compensation format include a ceiling for allowable costs in order to prevent a possible cost overrun. This compensation format is most suitable for the projects where the quality of the deliverables is more important than the cost.

Unfortunately, the level of the investment into the quality is not perfectly correlated with the actual degree of quality. However, there is a reason to believe that if the agent wants to compete for other contracts in the future, he will make an effort to keep the quality high and the costs as low as possible.

★ **Incentive contracts.** The risk is divided between the principle and the agent. In this compensation format, the parties priorly agree on certain goals for the deliverables of the contract, and agent will be compensated based on the compliance of the deliverables.

The contract includes some incentives, which can be based on KPI (key performance indicators), certain target cost, etc. The incentives might be set upon as a “carrot and stick”; for example: the “carrot” will be that the agent will receive a bonus if the work will be finished ahead of schedule, and the corresponding “stick” will be that compensation will be reduced in case of a schedule overrun. However, it is important to avoid too many incentives, since controlling of the execution of the contract is an additional cost and a time consumption for the client.

In addition to the three formats mentioned above, the contractor may also be compensated based on the amount of hours or days that they used on performing of the deliverable, so called hour- or day rates. This compensation format is usually used for services, and is one of the most used compensation formats in oil service contracts. (Osmundsen, Sørensen, Toft, 2010)

The compensation format which is based on a certain time-rate can be set upon as a combination of cost reimbursement compensation format and incentive contracts; compensation is based on an agreed day-rate, and the amount of days depends on either the contract duration or the set target date. This contract format contains also “carrot and stick” element from the incentive contracts; agent will receive a bonus if the Work is finished ahead of schedule, etc.

Day rates are varying depending on the operational status; that is, the rate will be different during the downtime from the rate on an ordinary day of active operation, etc. For example, day rates may be compensated in the following way (Osmundsen, Toft, Dragavik, 2005):

★ *Operation day rate per day = OR;*

★ *Stand-by rate per day = OR x 0,90;*

★ *Moving rate per day = OR x 0,80;*

- ★ *Suspension rate per day = OR x 0,50;*
- ★ *Lay-up rate per day = OR x 0,50;*
- ★ *Re-drilling rate per day = OR x 0,25;*
- ★ *No payment rate (or zero rate) = OR x 0.*

Since the rate is changing depending on the operational status, the contractor will try to keep equipment (or the entire rig) in the highest operational state in order to receive the highest possible day rate as well as finishing the Work in time. This may have a negative effect; for example, the agent may skip necessary maintenance of the equipment in order to continue active operation of the on the rig. The equipment may then stop completely, and result a downtime; the contractor will then receive a zero rate instead of a maintenance day-rate, and a bigger maintenance will require a greater expense.

## 2.3 Contracts in the petroleum industry

Most of the projects in the petroleum industry are complex, have a high level of risk and require great investments. Companies explore new areas which require more challenging exploration and production technologies. This challenges bring uncertainties, and require the development of new technology, which again require high expenses. The contracts covering these major projects should therefore be well formulated, with clear divisions of the Scope of Work, responsibilities, risk sharing between the parties, etc.

Although Norwegian law authorizes the parties to compose a contract as they want (Jusleksikon, 2017), petroleum industry tries to standardize contract management, just like other processes. The purpose behind creation of standardized contracts might be various, such as cost reductions, better contract administration and better contract quality. (Bull, 2016)

There are two types of standard contract formats that are commonly used in petroleum industry. The first Norwegian Fabrication Contract (NF) was created in 1987, and was updated 1992, 2005 and 2015. Norwegian Total Contract (NTK) was created in 2000 based

on NF, and was updated in 2005, 2007 and 2015. (Bull, 2016) The main difference between this two standard contract formats is that NTK comprises fabrication and assembly work, engineering and procurement, while NF includes only fabrication and assembly work. (Bjerkem, 2015) In the later chapters, the two contracts will be compared with NTK 07 and NTK 15.

NTK 07 was created by Statoil ASA, Norsk Hydro ASA and Norsk Industri (the Federation of Norwegian Industries). NTK 15 was based on NTK 07, and is the result of the work of Norsk Industri and Norsk Olje og Gass. (Bjerkem, 2015) There are just a few differences between these standard contract formats, which will be illuminated in detail in Chapter 4.

The structure of NTK 07 and NTK 15 is very similar. Conditions of the contract are described in the articles in the standard contract format. Article 2 contain also a list of appendices that should be provided in addition to the conditions of the contract, in order to specify the project contents. This appendices are (Bjerkem, 2015):

- A. Scope of Work
- B. Compensation Format
- C. Contract Schedule
- D. Administration Requirements
- E. Company's Documents
- F. Company's Deliverables
- G. Company's Insurances
- H. Subcontractors
- I. Contractor's Specification
- J. Standard Forms of Guarantees

The Conditions of Contract are general, and are meant to be a manual for the parties to be able to formulate further specifications of the current project in the contract's appendices. Appendices are not standardized in the same way as Conditions of Contract; however, the structure of the appendices is often similar, due to the likeness between the projects. Although Conditions of Contract often refer to the appendices, in case of conflict between the

documents, Conditions of Contract should be valued above the content in the appendices. (Bjerkem, 2015)

In recent years, it has become more common to base contracts on NTK also in other industries. For example, Bane NOR (*state-owned company responsible for the Norwegian national railway infrastructure* (Bane NOR, 2019)) has used NTK when preparing a contract for a new railway tunnel between Oslo and Ski. (Bjerkem, 2015) Many contracts are based on NTK/NF due to the following benefits (Bull, 2016):

- ★ Easy to modify for all kinds projects and equipment deliveries.
- ★ Well suited for major development projects.
- ★ Good English translation, so can also be used internationally.
- ★ A completed and "safe" interpretation that was used since, and is also relatively well known on the market.

## 3 Method

The word “method” comes from the Greek "methodos" which means "to follow a specific path towards a goal, research" (Tranøy, 2014). Thus, the method is the procedure for achieving the desired result.

The choice of method is absolutely important when conducting research on a topic of interest. The presentation of the selected method also ensures that the reader can confirm the findings of the thesis. This chapter will also present some general information about the choice of method.

### 3.1 Research strategy

There are several ways to perform research. It is easy to think that there is one ideal method for each research, and other methods can be abandoned. However, the truth is: the available methods have their strengths and weaknesses, and can often complement each other.

Combining several methods might help to obtain the goal of the problem. (Yin, 2003).

According to Yin (2003), the possible research strategies are:

<i>Method</i>	<i>Form of Research Question</i>	<i>Requires Control of Behavioural Events?</i>	<i>Focuses on Contemporary Events?</i>
<b>Experiment</b>	How, why?	Yes	Yes
<b>Survey</b>	Who, what, where, how many, how much?	No	Yes
<b>Archival analysis</b>	Who, what, where, how many, how much?	No	Yes/No
<b>History</b>	How, why?	No	No
<b>Case study</b>	How, why?	No	Yes

*Table 1: Properties of the different research strategies (Yin, 2003)*



Based on chapter 1, it is concluded that the questions "why" and "how" are more relevant to the objective of the thesis than "how much" or "how many". The purpose of the thesis is first and foremost to find out *how* the changes in the contract form have affected the principal and the contractor. A qualitative analysis must therefore be presented rather than a quantitative one.

It is obvious that there are some limitations related to the possible control over behavioural events. This thesis is based on the two written contracts, which are already signed and being executed, and therefore, they cannot be changed. Thus, the experiment must be excluded as an appropriate strategy.

The remaining strategies, the case study and the history strategy, have many common features. However, the case study contains two additional sources of evidence that are not a matter of course in the history strategy. These sources are (Yin, 2003):

- ★ Direct observation of the events or the situation which is studied, and
- ★ Interviewing people who were/are participating in these events.

This ability of the case study to deal with current events, and to use supporting materials such as documents, interviews and observations, makes it the most appropriate strategy for this thesis.

The case study can be defined in two possible ways; either based on the scope, or on the characteristics. The definitions, formulated in *Case study research - Design and Methods* (2003) by Robert K. Yin (p. 18), are:

1. *“A case study is an empirical inquiry that*

- ★ *investigates a contemporary phenomenon within its real-life context, especially when*
- ★ *the boundaries between phenomenon and context are not clearly evident.*

## 2. *The case study enquiry*

- ★ *cope with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result*
- ★ *relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result*
- ★ *benefits from the prior development of theoretical propositions to guide data collection and analysis.”*

The case study is sometimes criticised for being a weaker method in some scientific contexts. Critics believe that the case study is inaccurate and relevant only at the first stages of the study, not as a separate strategy (Yin, 2003). However, the case study can be used as a separate method as well, in cases similar to the one presented in this thesis.

## 3.2 Research design

Research design can be defined as a logical plan for getting from initial research questions or hypotheses to a final conclusion. It consists of collecting information and data, making various analyses. The work should be presented in such a way that the reader could be able to reproduce the thesis case. (Yin, 2003)

The choice can be made between four different types of design, see the figure below:

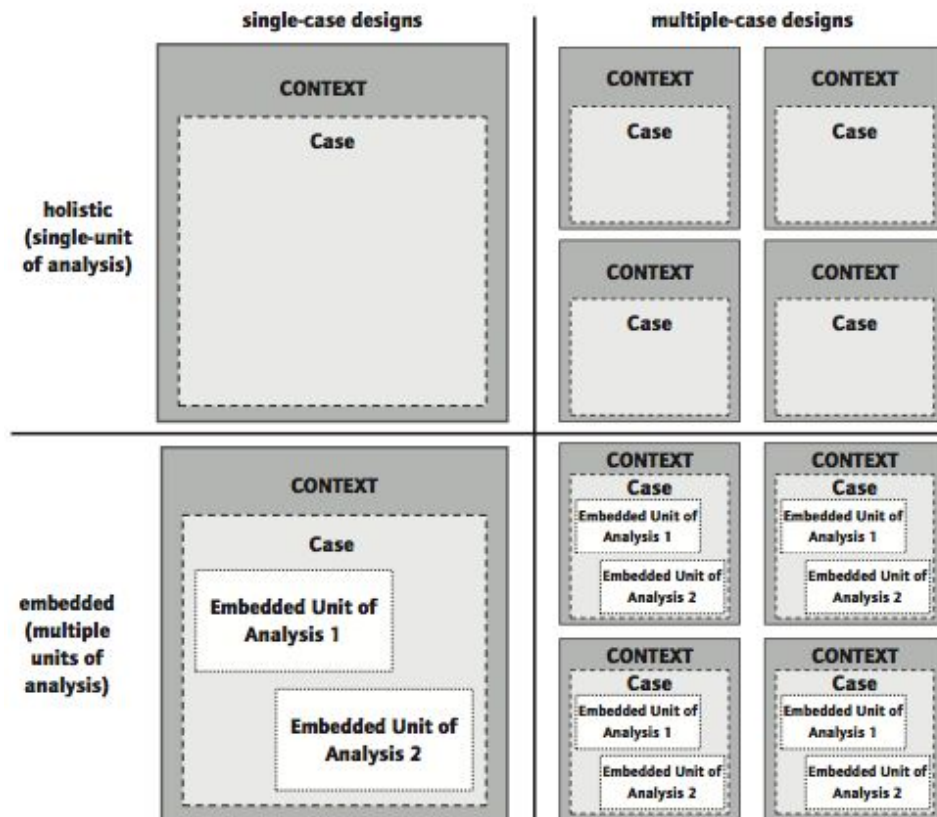


Figure 4: Basic types of designs for case studies (Yin, 2003)

The first choice is the choice between single- and multiple-case designs. Criteria for choosing single-case designs can vary, and might, for example, be a test of an existing hypothesis or theory. The multiple-case designs are usually more advanced, take longer to perform and require more experience with case studies. However, the latter is considered more reliable, as it allows the researcher to use more sources and perform more analyses; thus multiple-case designs should be chosen if there is capacity to perform these types of designs. (Yin, 2003)

The design of a case can also include several analyses. These additional analyses can add important information the case study, but the relevance of these must be taken into account. (Yin, 2003)

For this thesis, the embedded single-case design is chosen. Due to the lack of time, it is difficult to use any of the multiple-case designs. The thesis contains analysis of two different contracts; in other words, two analyses in one case.

### 3.3 Sources of evidence

Robert K. Yin presents the following six sources of evidence in *Case study research - Design and Methods (2003)*. The sources are listed together with corresponding strengths and weaknesses:

<i>Source of Evidence</i>	<i>Strengths</i>	<i>Weaknesses</i>
<b>Documentation</b>	<ul style="list-style-type: none"> <li>★ Stable – can be reviewed repeatedly</li> <li>★ Unobtrusive – not created as a result of the case study</li> <li>★ Broad coverage – long span of time, many events, and many settings</li> </ul>	<ul style="list-style-type: none"> <li>★ Retrievability – can be low</li> <li>★ Biased selectivity, if collection is incomplete</li> <li>★ Reporting bias – reflects (unknown) bias of authority</li> <li>★ Access – may be deliberately blocked</li> </ul>
<b>Archival Records</b>	<ul style="list-style-type: none"> <li>★ Precise and quantitative</li> <li>★ The rest are the same as for “documentation”</li> </ul>	<ul style="list-style-type: none"> <li>★ Accessibility due to privacy reasons</li> <li>★ The rest are the same as for “documentation”</li> </ul>
<b>Interviews</b>	<ul style="list-style-type: none"> <li>★ Targeted – focuses directly on case study topic</li> <li>★ Insightful – provided perceived causal inferences</li> </ul>	<ul style="list-style-type: none"> <li>★ Bias due to poorly constructed questions</li> <li>★ Response bias</li> <li>★ Inaccuracies due to poor recall</li> <li>★ Reflexivity – interviewee gives what interviewer wants to hear</li> </ul>
<b>Direct observations</b>	<ul style="list-style-type: none"> <li>★ Reality – covers events in real time</li> </ul>	<ul style="list-style-type: none"> <li>★ Time-consuming</li> </ul>

	<ul style="list-style-type: none"> <li>★ Contextual – covers context of event</li> </ul>	<ul style="list-style-type: none"> <li>★ Selectivity – unless broad coverage</li> <li>★ Reflexivity – event may proceed differently because it is being observed</li> <li>★ Cost-hours needed by human observers</li> </ul>
<b>Participant observations</b>	<ul style="list-style-type: none"> <li>★ Insightful into interpersonal behaviour and motives</li> <li>★ The rest are the same as for “direct observations”</li> </ul>	<ul style="list-style-type: none"> <li>★ Bias due to investigator’s manipulation of events</li> <li>★ The rest are the same as for “direct observations”</li> </ul>
<b>Physical artifacts</b>	<ul style="list-style-type: none"> <li>★ Insightful into cultural features</li> <li>★ Insightful into technical operations</li> </ul>	<ul style="list-style-type: none"> <li>★ Selectivity</li> <li>★ Availability</li> </ul>

*Table 2: Strengths and weaknesses of sources of evidence (Yin, 2003)*

During the work on this thesis, several of the sources of evidence listed above were used. One of the main sources has been documentation, in the form of the two contracts provided by BHGE, books and articles from either online sources or the University Library at the University of Stavanger. Some interviews with the personnel involved in contract management at BHGE were performed. The use of other sources, as for example physical artifacts, has been less relevant during the work on this thesis.

### 3.4 Evaluation of sources

Quality assurance of sources is a very important part of the work process. The researcher has great responsibility for retrieving the information from secure sources, as the correct information determines whether the result is correct. The variety in the quality of sources can be very large. When a researcher is to assess whether a source is worth using in future work, there are several parameters that play a role in this decision (Olaussen, Tørdal, 2018):

1. The source should seem credible, that it does not conflict with other sources and seems likely;
2. The source must be objective, produce facts and not claims, and, not least, that the author is objective;
3. The source must be relevant as the task is delimited in advance;
4. The source must be updated.

A lot of information was collected through BHGE, either documentation provided by the company, or interviews with the employees. This source has been updated, but employees in the company can be subjective. Different motivation among employees can also affect the credibility of this source. The employees will try to show their work in the best light and can thus exclude certain disadvantages of the product. This can also apply to a certain extent to tables and other information about the company's operating results. In addition, the information posted on the internet can be commercial, which will cause the source to be subjective; such an article will highlight either the positive or negative of the product depending on the author of the article.

Literature from the University Library at the University of Stavanger is a safe and credible source. However, the disadvantage of this source type is that it cannot be updated and is therefore mainly used for historical data and theoretical explanations. Nevertheless, such information can be very important when assessing the degree of development both in the legislation, and in the industry in general.

In addition to this, the researcher herself can be a source of error, as the information can be misunderstood or misinterpreted.

## 4 Analyses

In the following chapter, the two contracts between Equinor and BHGE are going to be presented and analysed. For purpose of simplicity, the contracts will be denoted as Contract 1 (Frame Contract (Contract), entered into on 03.07.2015 between Statoil Petroleum AS on behalf of the participants in the Licence Group (Company) and Baker Hughes Norge AS (Contractor)) and Contract 2 (Master Service and Supply Agreement ("Agreement"), entered into on 28.08.2008 between StatoilHydro ASA (Company) and Baker Hughes Norge AS (Contractor)). The related content of the contracts is included in this thesis.

The contracts are compared to the standard contract formats, for example NTK 15. The standard contract formats are developed by different companies working in the oil industry in Norway. The main purpose of developing these standard formats was to comply with Norwegian regulations and laws, as well as to ensure a fair distribution of duties and responsibilities.

### 4.1 Analysis of Contract 1

Contract 1 is a Frame Contract (Contract), entered into on 03.07.2015 between Statoil Petroleum AS on behalf of the participants in the Licence Group (Company) and Baker Hughes Norge AS (Contractor). Contractor is going to perform Work (Services and Contract Object in accordance with the Contract) which includes:

- ★ Contractor shall provide a complete Integrated D&W Service designed for the various wells and rigs. Contractor shall have the overall responsibility for planning and performing the Work.

- ★ Contractor shall provide all necessary personnel, equipment, tools and materials including all software and/or hardware required for the proper performance of the Work. Contractor shall ensure maintenance of the equipment, tools and materials.

Contract 1 will be compared to NTK 15, because this standard contract format was published the same year. The following table presents the structure of Contract 1, compared to NTK 15:

<i>Part</i>	<i>Contract 1</i>	<i>Part</i>	<i>NTK 15</i>
<b>I</b>	<b>General provisions</b>	<b>I</b>	<b>General provisions</b>
Art. 1	Definitions	Art. 1	Definitions
Art. 2	Contract documents and conflict between the Contract documents	Art. 2	Contract Documents. Interpretation
Art. 3	Purchase Order	Art. 3	Representatives and Personnel of the Parties
Art. 4	Contractor's obligation to deliver and Company's obligation to use the Contract		
Art. 5	Representatives of the Parties		
<b>II</b>	<b>Performance of the work</b>	<b>II</b>	<b>Performance of the work</b>
Art. 6	General obligations	Art. 4	Obligations of Contractor and Company – Main Rules
Art. 7	Authority Requirements	Art. 5	Authority Requirements. Permits
Art. 8	Company's Documents	Art. 6	Company's Documents and Company's Materials
Art. 9	Contractor's equipment and/or Contract Object	Art. 7	Contractor's Specification
Art. 10	Subcontracting	Art. 8	Subcontractors
Art. 11	Contractors personnel	Art. 9	Safety Courses, Trade Union Activities and Quality management
Art. 12	Data interpretation	Art. 10	Not used
Art. 13	Quality Assurance, and Health,		



	Environment and Safety		
<b>III</b>	<b>Duration and progress of the work</b>	<b>III</b>	<b>Progress of the work</b>
Art. 14	Contract Schedule	Art. 11	Contract Schedule. Delayed Progress
Art. 15	Delayed Progress		
<b>IV</b>	<b>Variations, Suspension and Cancellation</b>	<b>IV</b>	<b>Variations, Cancellation and Suspension</b>
Art. 16	Right to vary the Work	Art. 12	Right to vary the Work
Art. 17	Effects of a Variation to the Work	Art. 13	Effects of a Variation to the Work
Art. 18	Issue of Variation Orders	Art. 14	Issue of Variation Orders
Art. 19	Consequences of Variation Orders	Art. 15	Consequences of Variation Orders – Disputes about Consequences
Art. 20	Variation Order Request	Art. 16	Dispute as to whether a Variation to the Work exists. Disputed Variation Order
Art. 21	Cancellation	Art. 17	Cancellation
Art. 22	Effects of cancellation	Art. 18	Company’s Right to Temporary Suspension of the Work
Art. 23	Suspension		
Art. 24	Effects of suspension		
<b>V</b>	<b>Invoicing, payments, audit and title</b>	<b>V</b>	<b>Delivery and payment</b>
Art. 25	Compensation	Art. 19	Delivery and Completion of the work
Art. 26	Invoicing	Art. 20	Payment, Invoicing, Audit and Submission of Security
Art. 27	Payments	Art. 21	Not used
Art. 28	Audits	Art. 22	Title to the Deliverables. Right to Demand Delivery
Art. 29	Title to Contract Objects	Art. 23	Contractor Guarantee. Acceptance Certificate

<b>VI</b>	<b>Breach of contract</b>	<b>VI</b>	<b>Breach of contract</b>
Art. 30	Contractor's Delay	Art. 24	Contractor's Delay
Art. 31	Contractor's Defects	Art. 25	Contractor's Defects and Guarantee Liability
Art. 32	Suspension due to Contractor's breach of Contract	Art. 26	Termination due to Contractor's Breach of Contract
Art. 33	Termination due to Contractor's Breach of Contract	Art. 27	Company's Breach of Contract
Art. 34	Effects of termination due to breach of Contract		
Art. 35	Company's Breach of Contract		
Art. 36	Limitation of liability per Purchase Order for breach of Contract		
<b>VII</b>	<b>Force Majeure</b>	<b>VII</b>	<b>Force Majeure</b>
Art. 37	Effects of Force Majeure	Art. 28	Effects of Force Majeure
Art. 38	Notification		
Art. 39	Cancellation due to Force Majeure		
<b>VIII</b>	<b>Liability and insurances</b>	<b>VIII</b>	<b>Liability and insurances</b>
Art. 40	Contractor's indemnity	Art. 29	Loss of or Damages to the Deliverables or Company's Materials
Art. 41	Company's indemnity	Art. 30	Exclusion of Liability. Indemnification
Art. 42	Liability for anyone other than Contractor Group or Company Group	Art. 31	Insurances
Art. 43	Pollution from reservoir and property of Company		
Art. 44	Pollution from Contractor's property		
Art. 45	In-hole equipment		

Art. 46	Loss of hole, blowout, damage to reservoir and use of radioactive tools		
Art. 47	Radioactive sources		
Art. 48	Infringement of patents/property rights		
Art. 49	Indirect losses		
Art. 50	Notice of received claims		
Art. 51	Insurance		
		<b>IX</b>	<b>Limitation and exclusion of liability</b>
		Art. 32	Limitation and Exclusion of Liability
<b>IX</b>	<b>Proprietary rights, etc.</b>	<b>X</b>	<b>Proprietary rights, etc.</b>
Art. 52	Right to Information, Technology and Inventions	Art. 33	Right to Information, Technology and Inventions
Art. 53	Confidentiality	Art. 34	Confidential Information
<b>X</b>	<b>Other provisions</b>	<b>XI</b>	<b>Other provisions</b>
Art. 54	Assignment of the Contract	Art. 35	Assignment of the Contract, etc.
Art. 55	Company's right to utilize the Contract	Art. 36	Notices, Claims and Notifications
Art. 56	Amendments	Art. 37	Project Integrated Mediation
Art. 57	Notices and claims	Art. 38	Norwegian Law and Disputes
Art. 58	Export Control		
Art. 59	Norwegian Law and Disputes		

*Table 3: Comparison of the main parts and the articles of Contract 1 and NTK 15 (Norsk Industri, 2015)*

As shown in Table 3, the standard contract format and Contract 1 use more or less the same main parts. Although Contract 1 is based on the standard format, it is easy to find the differences between the content of NTK 15 and Contract 1. Some information that is found in

an article in NTK 15 may be found in another article (under a different heading) in Contract 1. It is important to take this into account when comparing the contracts.

#### 4.1.1 Comparison between Contract 1 and NTK 15

The main differences and similarities between Contract 1 and NTK 15 are listed below. Some of the findings play a major role in the objective of the thesis, while other findings are summed up to give an additional point of view for the reader. The findings are followed up with a comment.

- ★ *Part I: General provisions* is more or less the same in both Contracts; however, Contract 1 contains some additional articles: *Art. 3: Purchase order* and *Art. 4: Contractor's obligation to deliver and Company's obligation to use the Contract*.
  - Art. 3 regulates that Work should be ordered by a written purchase order;
  - Art. 4 ensures that Contractor will perform Work described in Appendix A. Although Company has no obligation to procure any minimum quantity under conditions of this Contract, Company is not entitled to use any other contractors, unless Contractor is unable to deliver at the agreed price, time of delivery and quality/quantity.
  
- ★ The set of Appendices is slightly different in Contract 1 compared to NTK 15:

<i>Appendix</i>	<i>Contract 1</i>	<i>Appendix</i>	<i>NTK 15</i>
A	Scope of Work	A	Scope of Work
B	Compensation	B	Compensation
C	Contract Schedule	C	Contract Schedule
D	Administration Requirements	D	Administration Requirements
E	Specifications	E	Company's Documents

F	Drawings	F	Company's Deliverables
G	Company Provided Items	G	Company's Insurances
H	Subcontractors	H	Subcontractors
I	Company's Insurances etc	I	Contractor's Specification
J	Standard Bank Guarantee	J	Standard Forms of Guarantees
K	Contractor's Proprietary Information		
L	Parent Company Guarantee		
	Purchase Order(s)		

*Table 4: Comparison of the Appendices of Contract 1 and NTK 15 (Norsk Industri, 2015)*

- The differences between the Appendices are not discussed in this thesis in detail. However, it is pertinent to mention that the Appendices in Contract 1 are customized to the current project, but the content is the same.
  - The fact that Contract 1 contains Purchase Orders in addition to ordinary Appendices, adds some additional articles and clauses to Contract 1, which contain information regarding the processing of the Purchase Orders.
- ★ In case of document conflict, Contract 1 has a priority order which is different from the NTK 15. Contract 1 takes precedence in the following order:
- a) the Conditions of Contract,
  - b) the Appendices, except Appendix D – Administration Requirements, which shall take priority after the other Appendices,
  - c) the Purchase Order.

- ★ Art. 6 of Contract 1 (*General obligations*) includes only the obligations for Contractor, not Company. It is different from NTK 15, where Art. 4 is *Obligations of Contractor and Company - main rules*. This might leave an impression that the contract is unilateral.
  
- ★ In addition to laws and regulations provided in *Art. 5: Authority Requirements. Permits* in NTK 15, Contract 1 also includes the Norwegian Penal Code and the United States Foreign Corrupt Practices Act (“FCPA”). *Art. 7: Authority Requirements* in Contract 1 also contains information about the indemnification in case one of the parties will not be able to receive the required licences, approvals or permits. This is an important clause, because this situation might be difficult to predict by the time that the contract is signed, but it can still occur.
  
- ★ When it comes to subcontracting, Contractor is required to get Company’s approval before hiring any subcontractors according to both contract and standard contract format. However, the requirements in Contract 1 are less strict; the reason for this might be that the Work that should be done by Contractor in Contract 1 is large and complex, and the probability of usage of subcontractors on some minor tasks exists.
  - *Art. 10: Subcontracting* in Contract 1 contains the following sentence:
 

“However, such consent is not required for minor purchases or limited use of hired labour.” The contract doesn’t contain any details about what “minor purchases” or “limited use of hired labour” means, so this might be interpreted differently. This may cause misunderstandings.
  
- ★ Contract 1 contains *Art. 11: Contractor's personnel*, which is not included in NTK 15 as a separate article (some this information is however included in Art. 3). According to this article, Company has a right to approve or replace any personnel involved in Work, and Contractor is obligated to provide qualified personnel. By doing so, Company will ensure control over key personnel in the project, although it might seem like exceeding limits from Contractor’s point of view. Sudden changes in key

personnel will influence the progress of the Work.

- ★ *Part IV: Variations, Suspension and Cancellation* in Contract 1 is less strict than the corresponding part in NTK 15. A possible explanation may be found in the first sentence of *Art. 16: Right to vary the Work* of Contract 1:

*“Company has the right to order Variations to the Work within the scope of what the parties could reasonably have expected at the time the Contract was entered into.”*

In other words, planned Work that is supposed to be done by Contractor may be hard to define at the time when the contract is signed, because the Work is complex and large, and both parties expect that variations may appear.

NTK 15 is a standard contract format that was created for all types of contracts.

Usually, contracts cover a smaller scope of Work, and specifications are therefore easier to specify. *Art 12: Right to vary the Work* in NTK 15 starts with the following sentence:

*“Company has the right to order such Variations to the Work as in Company's opinion are desirable.”*

This statement shows that the main reason for an initiation of a Variation is the desire of Company, and not a lack of information at the time when the contract was signed.

This statement is missing in the corresponding article in Contract 1. On the other hand, the same article ends with the following sentence:

*“Nevertheless, Company has no right to order Variations to the Work which cumulatively exceeds that which the parties could reasonably have expected when the Contract was entered into.”*

Which is similar to the statement in Contract 1.

- ★ As mentioned above, cancellation and suspension are less strict on Company in Contract 1 compared to NTK 15. For example, according to the standard contract format, Company should, among other clauses, pay: a certain cancellation fee, materials that are ordered prior to receipt of the cancellation, all of the administration costs etc. if the cancellation occurs. The only information in Contract 1 about the compensation in case of cancellation is the following: Company should pay for the Work which is already performed and the demobilization costs. These lenient formulations may cause conflict between the parties if the case of cancellation or suspension actually occurs.
  
- ★ Contract 1 is missing a corresponding article to *Art 19: Delivery and completion of the Work* in NTK 15. The article presents the procedure of the delivery of the Contract Object, which is concluding the Delivery Protocol when the Object is completed and tested. Even if the Object is not complete on the Delivery Date, the Protocol should still be signed and contain information about the outstanding part of Work.
  
- ★ According to *Art 24: Contractor's delay* in NTK 15, Company may require the delivery of the Contract Object with the assistance of another contractor in case of delay. The corresponding article in Contract 1 doesn't have the same option.
  
- ★ The Guarantee Period for the Contract's objects in NTK 15 is two years after the delivery Protocol is signed, while in Contract 1 it is one year. In addition to this, it is specified in Contract 1 that the Guarantee Period on Services that were performed by Contractor expire when Contractor leaves the Object; NTK 15 doesn't mention any guarantees on services.
  
- ★ *Art 35: Company's Breach of contract* in Contract 1 presents that if Company is late in making payments, Contractor will receive interest according to the Norwegian Act - "Interest on overdue payment" ("Forsinkelsesrenteloven").

On the other hand, *Art 27: Company's Breach of contract* in NTK 15 focuses on the adjustments in the project schedule in addition to the payment of interest. As well as



late payments, Company is breaching the contract if the decisions are made too slowly, or if the tools are delivered too late (though, the latter is not the case in Contract 1). Adjusting the Delivery Date seems to be more fair for Contractor, since Contractor is facing consequences in the case of delay.

- ★ Both Contract 1 and NTK 15 contain identical articles, which present that the party will be indemnified against any claim concerning either loss of life of personnel or damage of property of the other party in *Part VIII: Liability and insurances*. This leaves an impression that both Contract 1 and NTK 15 are bilateral.

Apart from that, both contracts contain more clauses on liability and indemnity, and these clauses are more specified in Contract 1 towards the current project. This is the reason why *Part VIII: Liability and insurances* has a lot more articles compared to the same part in NTK 15.

- ★ *Art 51: Insurance* in Contract 1 specifies neither what kind of insurances Company shall provide and maintain, nor what kind of insurances are required by Contractor. This is, however, done in NTK 15. In addition to this, Contract 1 lacks information about minimum amount for the claims. This might become a source for disagreements among the parties.
- ★ *Art 32: Limitation and Exclusion of Liability* in NTK 15 presents Contractor's total liability for breach of contract, which should be limited to  $[25]^{(2)}$  % of the Contract Price. This clause is missing in Contract 1.
- ★ Both the contract and the standard contract format are governed by and interpreted in accordance with Norwegian law, and any disputes shall be settled by court proceedings before Stavanger District Court if the parties could not resolve the disputes by mutual agreement.

However, Contract 1 doesn't contain as many details about prevention of disputes as NTK 15 does. *Art. 37: Project integrated mediations* says that the parties can either

find an arbiter or create a mediation panel that can help the parties in resolving the disputes.

#### 4.1.2 Scope of Work in Contract 1

The Scope of Work in Contract 1 is presented in Appendix A. It contains 20 parts and four annexes.

*Section 1: Introduction* contains a short description of Appendix A and some general requirements to the performance of Work. This section introduces the concept of TDM (Total Delivery Model); in this Contract, Contractor is supposed to provide a complete Integrated D&W (Drilling and Well) Service designed for the various wells and rigs. This includes a full integrated planning team for all services, all equipment, materials and tools required for Johan Sverdrup. D&W Services that should be provided by Contractor are:

1. Directional drilling
2. MLWD (Measurements and Logging While Drilling)
3. Mud logging
4. Directional Survey
5. Drilling and Completion Fluids
6. Waste Management
7. Cement
8. Pumping
9. Completion
10. Screens and ICD
11. Mechanical well wash
12. Liner hangers
13. Downhole Mechanical Isolation (DMI)

In order to obtain the best results, Contractor is required to follow discipline requirements, work to improve operational performance and efficiency, etc. The importance of Information and Communication Technology (ICT) is highlighted throughout the section; in addition to

good communication between the parties, Contractor will be provided with all necessary data, which will help Contractor to improve safety and efficiency of the project.

Furthermore, Section 1 describes some general requirements regarding services, equipment and materials handling, planning, follow up, progress monitoring, reporting, administration and support functions, maintenance, area of operations and Risk Assessment.

*Section 2: Organisation* contains regulations about Contractor's office and warehouse. Contractor shall provide a 24 hour service in addition to having a manned office during all working days, 08.00 - 16.00.

*Section 3: Personnel* contains requirements of personnel performing the Work. Contractor is obligated to provide an optimized number of qualified offshore personnel, preferably cross trained personnel (since this will reduce the number of personnel on board). Personnel will be nominated for a specific rig or installation, and can only be replaced after notifying the Company. All of the personnel involved in Work should receive training and education which will improve personels qualifications.

*Section 4: Contractor's equipment* contains regulations about provided equipment, tools, materials and software, which are necessary to perform the Work. Contractor bears all of the responsibilities; equipment should be approved according to Company's governing documents, HSE and governmental regulations, while the process should efficient, safe and cost efficient. This part also covers maintenance, consumables and Company's right to specify equipment.

*Section 5: HSE* contains general information about HSE requirements set by Company. Contractor shall provide qualified personnel to perform HSE tasks. Contractor shall also provide Company with information regarding Contractor's use and discharge of chemicals for all operations. All personnel involved in performing the Work shall perform self-assessments to improve HSE competence.

*Section 6: New technology and development* is about the importance of developing new

technology, since it can contribute to greater efficiency and improve environment and HSE. The improvements should apply to hardware as well as software. Company should have the right to use Contractor's latest technology, but is not required to procure such solutions.

*Section 7: Quality requirements* and *Section 8: Reporting requirements* describe how to measure quality of the performed Work and how to report it. In addition to Company's KPI (key performance indicator), the quality parameters include environment, safety, planning, logistics, and research. All the Work which is performed by Contractor should be documented and reported. It is also important to report any technical or HSE related incidents to Company, and implement corrective actions.

*Section 9: Logistics and Supply* describes the Contractor's responsibilities regarding logistics and supply; Company is only responsible for the following offshore logistics activities: supply bases, transportation vessels and helicopter transportation. This section sums up some general regulations about transportation (documentation, packing and marking requirements), inventory system (storage and a database with history data on provided equipment), etc.

*Section 10: Real time data* contains information about providing real time data to Company.

Sections 11-20 are discipline requirements, and will not be discussed in detail. The requirements are mostly technical, and are less relevant for the objective of this thesis.

#### 4.1.3 Compensation in Contract 1

This chapter is based on the following parts of *Appendix B: Compensation* of Contract 1:

- ★ Introduction;
- ★ Compensation; and
- ★ Discipline Requirements.

For the Work required to perform drilling and well operations, Company shall compensate Contractor the relevant combination of Offshore Day Rate, Meter Rates, Cubic Rates and

Equipment Package Prices, listed in *Annex 1 - Prices* in Appendix B.

The Offshore Day Rate is an all inclusive rate for offshore equipment and personnel, including:

- ★ Any additional equipment or services needed to perform the Scope of Work, not already covered in Meter or Package Rates as described in the discipline requirements; maintenance of the equipment.
- ★ Ordinary time, overtime, shuttling time, waiting time
- ★ Safety exercises and safety meetings, safety training courses including Company-specified safety training
- ★ Mobilisation and demobilisation cost
- ★ Travel cost between home and designated heliport

However, Company is compensating Onshore personnel (such as planning personnel) by a Day/Month Rate.

The meter rates and the cubic rates are based on the number of units a customer consumes. These rates may be used for, for example, Directional drilling rates in Contract 1.

Equipment Package Rates cover the relevant equipment package prices for completion of the Contract Object. For example, Contractor provides “*Rental package for ASV retrieval*” which can be compensated either by a Day Rate, or rented for a certain number of days by paying a fixed price.

## 4.2 Analyses of Contact 2

Contract 2 is a Master Service and Supply Agreement ("Agreement"), made and entered into on 28.08.2008, by and between StatoilHydro ASA ("Company") and Baker Hughes Norge AS ("Contractor"). Contractor shall provide Drilling and Completion Fluids Services, including supply of products, materials, equipment and personnel necessary for the proper and timely performance of the Work.

Contract 2 will be compared to NTK 07, because this standard contract format was the newest standard format contract in the year 2008. The following table presents the structure of Contract 2, compared to NTK 07:

<b>Part</b>	<b>Contract 2</b>	<b>Part</b>	<b>NTK 07</b>
<b>I</b>	<b>General Conditions</b>	<b>I</b>	<b>General provisions</b>
Art. 1	Definitions	Art. 1	Definitions
Art. 2	Contract documents and conflict between the Contract documents	Art. 2	Contract Documents. Interpretation
Art. 3	Purchase Order	Art. 3	Representatives and Personnel of the Parties
Art. 4	Contractor's obligation to deliver and Company's obligation to use the Contract		
Art. 5	Representatives of the Parties		
<b>II</b>	<b>Performance of the work</b>	<b>II</b>	<b>Performance of the work</b>
Art. 6	General obligations	Art. 4	Obligations of Contractor and Company – Main Rules
Art. 7	Authority Requirements.	Art. 5	Authority Requirements. Permits
Art. 8	Company's Documents	Art. 6	Company's Documents and Company's Materials
Art. 9	Contractor's equipment and/or Contract Object	Art. 7	Contractor's Specification
Art. 10	Subcontracting	Art. 8	Subcontractors
Art. 11	Contractors personnel	Art. 9	Safety Courses and Trade Union Activities
Art. 12	Data interpretation	Art. 10	Quality management etc
Art. 13	Quality Assurance, and Health, Environment and Safety		
<b>III</b>	<b>Duration and progress of the</b>	<b>III</b>	<b>Progress of the work</b>

	<b>work</b>		
Art. 14	Contract Schedule.	Art. 11	Contract Schedule. Delayed Progress
Art. 15	Delayed Progress		
<b>IV</b>	<b>Variations, Suspension and Cancellation</b>	<b>IV</b>	<b>Variations, Cancellation and Suspension</b>
Art. 16	Right to vary the Work	Art. 12	Right to vary the Work
Art. 17	Effects of a Variation to the Work	Art. 13	Effects of a Variation to the Work
Art. 18	Issue of Variation Orders	Art. 14	Issue of Variation Orders
Art. 19	Consequences of Variation Orders	Art. 15	Consequences of Variation Orders – Disputes about Consequences
Art. 20	Variation Order Request	Art. 16	Dispute as to whether a Variation to the Work exists. Disputed Variation Order
Art. 21	Cancellation	Art. 17	Cancellation
Art. 22	Effects of cancellation	Art. 18	Company’s Right to Temporary Suspension of the Work
Art. 23	Suspension		
Art. 24	Effects of suspension		
<b>V</b>	<b>Invoicing, payments, audit and title</b>	<b>V</b>	<b>Delivery and payment</b>
Art. 25	Compensation	Art. 19	Delivery and Completion of the work
Art. 26	Invoicing	Art. 20	Payment, Invoicing, Audit and Submission of Security
Art. 27	Payments	Art. 21	Establishment and Payment of Target Price and Fixed Price
Art. 28	Audits	Art. 22	Title to the Deliverables. Right to Demand Delivery
Art. 29	Title to Contract Objects	Art. 23	Contractor Guarantee. Acceptance Certificate
<b>VI</b>	<b>Breach of contract</b>	<b>VI</b>	<b>Breach of contract</b>

Art. 30	Contractor's Delay	Art. 24	Contractor's Delay
Art. 31	Contractor's Defects	Art. 25	Contractor's Defects and Guarantee Liability
Art. 32	Suspension due to Contractor's breach of Contract	Art. 26	Termination due to Contractor's Breach of Contract
Art. 33	Termination due to Contractor's Breach of Contract	Art. 27	Company's Breach of Contract
Art. 34	Effects of termination due to breach of Contract		
Art. 35	Company's Breach of Contract		
Art. 36	Limitation of liability per Purchase Order for breach of Contract		
<b>VII</b>	<b>Force Majeure</b>	<b>VII</b>	<b>Force Majeure</b>
Art. 37	Effects of Force Majeure	Art. 28	Effects of Force Majeure
Art. 38	Notification		
Art. 39	Cancellation due to Force Majeure		
<b>VIII</b>	<b>Liability and insurances</b>	<b>VIII</b>	<b>Liability and insurances</b>
Art. 40	Contractor's indemnity	Art. 29	Loss of or Damages to the Deliverables or Company's Materials
Art. 41	Company's indemnity	Art. 30	Exclusion of Liability. Indemnification
Art. 42	Liability for anyone other than Contractor Group or Company Group	Art. 31	Insurances
Art. 43	Pollution from reservoir and property of Company		
Art. 44	Pollution from Contractor's property		
Art. 45	In-hole equipment		
Art. 46	Loss of hole, blowout, damage		



	to reservoir and use of radioactive tools		
Art. 47	Radioactive sources		
Art. 48	Infringement of patents/property rights		
Art. 49	Indirect losses		
Art. 50	Notice of received claims		
Art. 51	Insurance		
		<b>IX</b>	<b>Limitation and exclusion of liability</b>
		Art. 32	Limitation and Exclusion of Liability
<b>IX</b>	<b>Proprietary rights, etc.</b>	<b>X</b>	<b>Proprietary rights, etc.</b>
Art. 52	Right to Information, Technology and Inventions	Art. 33	Right to Information, Technology and Inventions
Art. 53	Confidentiality	Art. 34	Confidential Information
<b>X</b>	<b>Other provisions</b>	<b>XI</b>	<b>Other provisions</b>
Art. 54	Assignment of the Contract	Art. 35	Assignment of the Contract, etc.
Art. 55	Company's right to utilize the Contract	Art. 36	Notices, Claims and Notifications
Art. 56	Amendments	Art. 37	Prevention of Disputes
Art. 57	Notices and claims	Art. 38	Norwegian Law and Disputes
Art. 58	Export Control		
Art. 59	Norwegian Law and Disputes		

*Table 5: Comparison of the main parts and the articles of Contract 2 and NTK 07 (Norsk Industri, 2007)*

When comparing Table 3 and Table 5, the first observation that can be made is that both the main parts and the articles of Contract 1 and Contract 2 are identical.

There are just a few changes in the standard contract formats; the article, *Art. 21: Establishment and Payment of Target Price and Fixed Price* was removed in the newer version. In addition to this *Art. 37: Prevention of Disputes* was replaced with *Art. 37: Project Integrated Mediation* in NTK 15.

Since the structure of the contracts is almost identical, the findings that related to the structure of the contracts will not be mentioned further in this analysis of Contract 2.

#### 4.2.1 Comparison between Contract 2 and NTK 07

As was mentioned in the previous subchapter, the structure of the Conditions of Contract in Contract 1 and Contract 2 is very similar. This might be explained by a long history of cooperation between Equinor and BHGE. The companies have worked together on several projects, and might therefore use the same pattern when creating Conditions of the Contract for a new contract.

However, some changes might occur, as different governmental regulations might have changed during the time between the two contracts were signed, or if the task is slightly different.

*Art. 4 Contractor's obligation to deliver and Company's obligation to use the Contract* in Contract 1 contains one additional paragraph about the simplified tender process regarding the Contractor awarded the services in *Appendix A - Scope of Work* for any licence/field/area/country. This was discussed in detail in Chapter 4.1.2.

Since Conditions of the Contract are very similar to each other, many of the findings were already mentioned in Chapter 4.1.1. Therefore, this subchapter will only contain the differences between Contract 2 and NTK 07 which vary from the ones mentioned in Chapter 4.1.1.

★ *Art. 6: General obligations* in Contract 2 is less detailed compared to the corresponding article in NTK 07. It is missing important clauses such as:

- *Contractor shall cooperate with Company and other contractors to ensure that all activities are carried out efficiently and without delay;*
- Company can place certain personnel at Contractor's disposal for the performance of the Work, if this is agreed between the parties; however, Contractor has a right to demand that personnel be removed.

Although these sentences might seem like a trivial omission, they should be included in the contract. For example, a clause about cooperation with other contractors is important if a conflict between different contractors actually occurs. Compared to the situation in Contract 1, when there was only one Contractor, there could be several contractors on the same Contract Object in this situation.

★ In Contract 2, Contractor is responsible “*for all work, acts, omissions and defaults of any Subcontractors as fully as if they were work, acts omissions or defaults of Contractor*”. This is different from NTK 07; the standard contract format describes several cases when Company indemnifies Contractor from direct consequences if the delay (or any other issues) arise because of the Subcontractor; these are:

- *The insolvency of the Subcontractor, or*
- *Company instructing the Subcontractor to give other deliveries higher priority at the expense of the relevant Subsupply, or*
- *Company intervening in any other manner in matters concerning the Subsupply in question.*

In addition to these conditions, Company is obligated to pay the expenses if Contractor can prove that these expenses are caused by the delay of the Subcontractor, and Contractor couldn't do anything to prevent this situation.

★ NTK 07 contains a lot of details about prevention of disputes. *Art. 37: Prevention of Disputes* says that the parties shall find an arbiter and arrange monthly meetings, where the parties can discuss disagreements. The arbiter shall then either find a solution based on the Conditions of the Contract, or suggest another method for finding a solution to the particular problem. Contract 2 doesn't include a corresponding article; if any disputes occur, the dispute should be settled by court proceedings before Stavanger District Court, unless they can be resolved by mutual agreement.

Several articles in the standard contract format refer to Art. 37. For example, *Art. 20: Payment, Invoicing, Audit and Submission of Security* in NTK 07 contains a clause about resolving the disputes regarding payment with the help of an arbiter. Neither arbiter, nor mediation panel are mentioned in Contract 2.

#### 4.2.2 Scope of Work in Contract 2

The Scope of Work in Contract 2 is presented in *Exhibit A: Scope of Work*. This Exhibit is divided into seven sections, and contains one Annex.

*Section 1: General* contains a short description of the content of the Appendix, and a full definition of the Work for this contract, which is:

*“Contractor shall provide Drilling and Completion Fluids Services, including supply of products, materials, equipment and personnel necessary for the proper and timely performance of the Work. The Work shall be performed for the Licenses and on the Company bases listed in Annex A1 - Area of Operation and base facilities”*

Furthermore, it is mentioned that Company can add fields, installations and mobile units to Annex A1, and the same Conditions of Contract and prices will apply. In addition to this, Company may add or remove up to 10 % of scope yearly based on the performance evaluation of Contractor.

*Section 2: Personnel* contain regulations about the qualifications and working hours of the personnel, both offshore and onshore support personnel. Contractor shall provide a 24 hour service in addition to having a manned office during all working days, 08.00 - 16.00.

*Section 3: Contract Object and rental equipment* contains regulations about provided equipment, tools, materials and software, which are necessary to perform the Work. Contractor bears all of the responsibilities; equipment should be approved according to Company's governing documents, HSE and governmental regulations, while the process should efficient, safe and cost efficient. This part also covers maintenance, consumables and transportation of equipment to the Contract Object.

*Section 4: Quality requirements* describes how to measure quality of the performed Work and how to report it. In addition to Company's KPI (key performance indicator), the quality parameters include environment, safety, planning, logistics, and research. All the Work which is performed by Contractor should be documented and reported. It is also important to report any technical or HSE related incidents to Company, and implement corrective actions.

*Section 5: Other provisions* contains Contractor's obligation to prepare a need list, information about lead time for delivery of equipment and mobilisation time of equipment and personnel, and Company's use of additional mobile units for Work.

*Section 6: Optional Work* presents that Company has the right to utilise the Contract for work under any licence on NCS. The Contract can also be utilised outside the NCS, but then Company and Contractor must agree on possible adjustments.

*Section 7: Discipline requirements* is the most comprehensive part of Appendix A. It contains a detailed description of the Work and list of requirements to the different phases of Work. In addition, there are also requirements to HSE, maintenance, personnel, laboratory services, materials, equipment, logistics and supply. Most of these requirements are technical, and are not relevant for the objective of this thesis.

### 4.2.3 Compensation in Contract 2

This chapter will only cover a few parts of *Exhibit B: Compensation*, which are

- ★ Introduction;
- ★ Discipline Requirements; and
- ★ Contract Object prices and equipment rental rates

since these three parts are most relevant for the objective of this thesis.

Exhibit B presents compensation for performing of the Work. All rates and prices that are specified in the Contract apply to all costs incurred by Contractor, including:

- ★ All costs and benefits in respect to any equipment and consumables, as well as necessary parts and equipment which is needed to assemble the equipment to the drilling unit. Company will also cover costs for transportation, storage, testing and maintenance of the equipment.
- ★ Technical and operation support, including planning and coordination, and laboratory services.
- ★ Employees wages, bonuses, insurances, consumables, vacations etc.
- ★ Duties and taxes, as well as all other contributions related to governmental laws and regulations.

All of the costs above are compensated based on Annexes in Exhibit B, and are compensated based on either Meter Rates, Cubic Rates or Day/Month Rates.

In Contract 2, Drilling- and Completion fluids are the only deliverables that can be compensated in three different manners:

- ★ Based on Volume rates (based on volume measured at load out point and volume mixed at Installation),

- ★ Based on Material Rates (consignment principle - Contractor will be compensated for actual usage in the well), or
- ★ Based on Meter rates (begins when starting drilling formation and ceases when reached total depth).

Company chooses the compensation format when signing a purchase order.

## 5 Discussion

This Chapter will mainly focus on the differences between *Appendix A: The Scope of Work* and *Appendix B: Compensation* in Contract 1, and *Exhibit A: The Scope of Work* and *Exhibit B: Compensation* in Contract 2, as they have a direct connection to the objective of this thesis. At the end of the chapter, potential weaknesses will be analysed and discussed.

In general, Company has a greater influence on Contractor in Contract 1 compared to Contract 2. This can be noticed in several articles of the contract; to mention an example, the regulations regarding the change for key personnel are more strict in Contract 1, and can even lead to reduced compensation; this clause is missing in Contract 2. At the same time, Contractor has more freedom to choose how to perform the requested Scope of Work. Contract 1 is a TDM; in other words, Contractor has ensured a bigger Scope of Work in Contract 1 compared to Contract 2. The fact that there is only one Contractor that performs a bigger Scope of Work in a project can have many benefits, in terms of efficiency, cost efficiency, timesaving and communication, but there are also some disadvantages.

An overview of the corresponding advantages and disadvantages for Company and Contractor is presented in the table below:

<b>COMPANY</b>		<b>CONTRACTOR</b>	
<b>Pros:</b>	<b>Cons:</b>	<b>Pros:</b>	<b>Cons:</b>
Expenses are known	In case of zero rate, Company still has to pay to the other parties	Incomes are known: Contractor can plan	Expenses are unknown and may vary
		May increase the income by working efficiently	Risks the lack of work
		Easier to provide cross trained personnel	May lack expertise in advanced situations



Ensures stable supply of equipment and materials	If Contractor is sold out, it will be difficult to find a new supplier	Synergy of equipment and materials	If unable to provide the equipment or materials and therefore results the down time - zero rate
	Less control over service delivery	More control over service delivery	
Less personnel controlling the execution of the contract		Less personnel controlling the execution of the contract	
Communication between the parties		Communication between the parties	

*Table 6: Corresponding pros and cons for the parties with the new contract model*

## 5.1 Compensation

In Contract 2, Contractor was performing a smaller Scope of Work, and the income depended on the amount of items or services that were delivered to Company. In Contract 1, the situation is different; Company compensates Contractor for the performance of the Work, and not for each item or service separately.

- ★ This may be a great advantage for Contractor. Since it is easier to estimate the total compensation, it is easier for Contractor to plan expenses related to the performance of the Work. Also, Contractor can continuously search for new ways to reduce the cost related to the performance of the Work; compensation will be the same anyway, so Contractor will have a higher profit.

On the other hand, Contractor may have higher expenses compared to incomes. The probability for this is highest at the beginning of the project, since Contractor hasn't yet established the necessary routines and may have some unexpected expenses. However, neither Company nor Contractor can predict expenses exactly, and Contractor could have underestimated expenses. If this trend continues over a long

time, and the deficit is high, Contractor may even risk going bankrupt.

- Contractor cannot affect the income directly; however, by performing the Work faster than originally planned, Contractor will receive a bonus. In this way, Contractor can be rewarded for working effectively. This may not be the best strategy in the long term; if Contractor performs the Work too fast, there will be no more Work to perform, and Contractor will remain without a source of income.
  
- ★ The fact that Company knows expenses may be seen upon as an advantage. As mentioned above, Company compensated Contractor based on the amount of the deliverables that were used during the performance of the Work in Contract 2. By compensating Contractor for the whole Work done instead of only paying for each single item, Company is reducing the risk of paying too much for the performance of the Work.

Despite the risk being minimized, the expenses may increase unexpectedly. In addition to such unexpected expenses such as increased taxes or a Force Majeure, Contractor may also cause a downtime. In this case, Company will not compensate Contractor at a usual rate during the downtime, but there are still some expenses that have to be covered by the Company. As mentioned in *4.1.2 Scope of Work in Contract 1*, these expenses might be the ones regarding supply bases or transportation vessels, as these are the expenses which are covered by the Company.

## 5.2 Personnel

Human resource is one of the biggest expenses for the employer. In addition to regular salaries, workers receive sick-leave, insurances, etc; there are additional personnel who are taking care of the ordinary workers offshore, for example canteen personnel. An integrated contract may affect the amount of personnel performing the Work in the following ways:

- ★ Since Contractor is going to perform a large Scope of Work, it is easier to find cross trained personnel that can be used to do various tasks. Cross trained personnel will reduce the amount of people involved in Work which will increase cost efficiency.

This may become a disadvantage in a critical situation. Cross trained personnel have broad expertise in several fields, but in case of an emergency the situation may require expert knowledge to prevent a mistake.

- ★ Both Company and Contractor need fewer people to control the execution of the contract. In the old model, Company had several Contractors for the same Scope of Work, and it required more personnel to control the execution.

Communication between and within the parties is very important in every project. Conflicts may be difficult to avoid; the advantage of Contract 1 is that there is only one Contractor performing the Work on the Contract Object, and the possibility of a conflict between different Contractors can be excluded.

### 5.3 Equipment and materials

An integrated contract also has some important advantages when it comes to equipment and materials.

According to Kraljic's Matrix, which was presented in *Chapter 2.1: Procurement*, the relationship between Company and Contractor in Contract 1 may be considered strategic; the deliverables are definitely important for the Company, and the deliverables can be considered complex, since the Scope of Work is large. Long-term relationship also characterizes Strategic partnerships. As mentioned in theory, this relationship has some advantages and disadvantages, which will also apply to Contract 1:

- ★ By entering into a partnership with the Contractor, Company will ensure a constant supply of the required deliverables.
  
- ★ However, if the Contractor, for any reason, is not able to deliver the required deliverable, the Company will struggle to find a possible substitute to this deliverable. Not only because the deliverable might be unique, but also because setting up a new procurement strategy will take considerable time and resources.

Since the Scope of Work is large, Contractor may take advantage of synergy effect on the equipment and materials. Synergy effect may be defined as *the combined power of a group of things when they are working together that is greater than the total power achieved by each working separately*. (Cambridge Dictionary, 2019) That is; when producing a bigger amount of the same item, the cost per unit will be lower. It may result in, among other things, some certain fixed costs are only paid once, and don't depend on the amount of units produced. Good planning is important in order to obtain this advantage. The same idea can be also applied for logistics and transportation.

It is also much easier to manage rental equipment when there is only one Contractor performing the Work on the rig. Different Contractors may rent the same equipment from different suppliers several times; this unnecessary cost will be avoided if the Contractor creates a good strategy. However, there is a risk that the rental equipment will sometimes stay unused, while other days will be overloaded due to the adjustments in the Contract Schedule of the project.

## 5.4 Potential weaknesses in the analysis

When performing an analysis, there are always some potential weaknesses that must be taken into account before giving the final conclusion. Some of the potential weaknesses that could have occurred during the work on this thesis will be summed up below.

As mentioned in *Chapter 1.6: Scope of the report*, the scope of this thesis was narrowed down due to the lack of time and resources. There were only two contracts that were compared to each other, and both contracts are between Equinor and BHGE. In order to obtain an even more objective conclusion, it could have been informative to study either more than two contracts, or two between various companies.

The result of the analysis may be biased if a systematic error has occurred during the work on this thesis. The result is biased when the result is not the same as the “unknown true value”, or if the point of view is not neutral. This might be a potential weakness in this thesis, since the author has only cooperated with one party, Contractor. However, the author tried to be objective, and not favor any of the parties.

The reader should also take into account that the author of this thesis has limited experience on the topic. The author could have misunderstood the information, or could have interpreted it differently. However, the findings were analysed and discussed based on theory to the best of knowledge.

## 6 Conclusion

This chapter will provide a conclusion of the thesis hypothesis, and suggest topics for future work and further studies.

### 6.1 Conclusion to the hypothesis

As stated in Chapter 1.2, the thesis is based on the following hypothesis, H1:

“An integrated contract is the best solution for both parties, Contractor and Company”.

Given hypothesis H1, the corresponding null hypothesis H0 is:

“An integrated contract is not the best solution for both parties”.

As mentioned in *Chapter 1: Introduction*, it may be difficult to formulate an objective answer for these hypotheses, since “best solution” is a subjective assessment. To prevent a subjective answer, some research questions were formulated; the contracts were analysed based on these questions, and after the discussion of the findings, the conclusion to the hypothesis of this thesis is:

**An integrated contract is the best solution for both parties, Contractor and Company.**

That is, there are more findings that state H1 rather than H0, and more advantages were found for both the Company and the Contractor rather than disadvantages in the integrated contract. Although there are several disadvantages for the parties, most of them are special cases which will not necessarily occur.

### 6.2 Suggestion for further studies and future work

Although there are more advantages for both parties, there are still some disadvantages in the contracts that can be worked upon.

There is a reason to believe that Equinor and BHGE will continue their cooperation into the future. On the 18th of June 2018, BHGE made it widely known that the company has signed another integrated well services contract with Equinor. Lorenzo Simonelli, Chairman & CEO at BHGE said (BHGE, 2018):

*“BHGE and Equinor have partnered on some of the most challenging and groundbreaking projects in the North Sea. This agreement further cements our relationship with Equinor and demonstrates the value that we can create through close, long-term collaboration with our customers that reduces overall cost and streamlines equipment and service deliveries.”*

It is therefore important to continue the development of the integrated contracts to ensure the achievement of greater efficiency and a cost reduction for future projects.

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