



University of
Stavanger

FACULTY OF SCIENCE AND TECHNOLOGY

MASTER'S THESIS

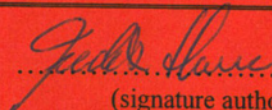
Study program/specialization:

Master of Science, Industrial Economics
Project- and Contract Management

Spring semester, 2009

Confidential 

Author: Fredrik Horne


.....
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Instructor: Petter Osmundsen, University of Stavanger

Supervisor: Frank Lind, Aker Solutions

Title of Master's Thesis:

An analysis of the Target budget model and related processes in Aker Solutions offshore projects, and an alternative approach with a new remuneration scheme related to spot price on input factors.

Norwegian title:

En analyse av Målbudsjett modellen og relaterte prosesser i Aker Solutions offshoreprosjekter, samt en lansering av et nytt kompensasjonsformat knyttet til prisen på råvarer.

ECTS: 30

Subject headings:
Target budget model
Incentives
Spot price remuneration
Indexation

Pages: 110
+ attachments: 1

Stavanger, 12.06.2009
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Summary

This thesis deal with the use and establishing of target budget as a remuneration scheme, and also a new remuneration schemes are launched based on spot prices of input factors. The report begins with a description of the two problems and the background for this thesis, followed by chapters with methodology and facts. The method chapter describes the methodology and structure in the process of this thesis and used method of research. The facts are about Aker Solution and the subsidiary companies and the Norwegian offshore standard contracts. Next the chapter with relevant theory is presented to give a basis for the discussion and conclusion. The cases with there target budget models are examined, on basis of the contract, interviews, presentations and reports. The spot prices as a remuneration scheme are presented, linked to both related to price on raw materials and oil. The summing up of these cases is the basis for discussion and conclusion.

The Target budget model is the preferred remuneration scheme in Aker Solutions presented maintenance and modification projects, probably because it gives Aker Solutions as a supplier the incentives to reduce the cost of the project. The model also contributes to the two parties having the same objectives in the execution of the work. The supplier's incentive in this remuneration scheme is to save money for the owner, and by this his profit increases. Similarly the suppliers profit is reduced in the event of increased costs for the owner. In both this scenarios there are set a cap for the suppliers profit or loss as a result of the project. The thesis describes many of the factors that influence on setting this cap, both from a supplier and owner situation. The terms of the cap and profit distribution are often set in negotiation process, and reflect the division of power. The client's former contracts and the consensus in the work collaboration among the parties influence much on how successful the use if the target budget model is, and especially regarding variations in the project.

The constant fluctuations in the market have lead to an alternative approach with a new remuneration scheme related to spot prices on input factors. This remuneration scheme gives the parties in the contract a more fear sharing of the changes costs that are beyond there control. A quality assurance of the model related to the Norwegian surtax system is described, and some practical examples are shown. The spot price remuneration scheme has to be linked to a credible index that is highly relevant to the costs of the project.

Preface

This thesis marks the end of my Master of Science study in Industrial Economics at the University of Stavanger. The thesis is written in the company Aker Solutions and has been prepared during the spring term 2009.

I would like to take the opportunity to thank Aker Solution for providing me with the requisite resources. Particularly thanks goes to Frank Lind, who have been the responsible contact in Aker Solutions, for the practical organising and intermediary of contact. I am grateful to all the people I have meat with in Aker Solutions projects and project management department for helping me, and providing useful information during this study.

I would also like to thank professor Petter Osmundsen at University of Stavanger for his support and academic guidance during this process.

Fredrik Horne

Stavanger, June 2009

Content

Summary	1
Preface	2
Content	3
List of figures	6
List of tables	7
List of tables	7
Abridgements and specification of word	8
1. Introduction	10
1.1 Background for the thesis	10
1.2 Approach to the problem and delimitation of the thesis	11
1.3 The structure of the thesis	12
2. Method, the selection and use	14
2.1 Method – an introduction	14
2.2 What is then a method?	14
2.3 Methodical approach	14
2.4 Requirements to the information and data	15
2.4.1 Reliability and validity	15
2.4.1.1 Validity	15
2.4.1.2 Reliability	16
2.5 Sources of error	17
2.6 Requirement for the use of methods	17
2.7 Selection of method in this thesis	18
2.7.1 The methodical use in this thesis	19
3. Presentation of facts	21
3.1 Aker Solutions	21
3.2 Aker Offshore Partner	22
3.3 Aker Offshore Partners different contracts	23
3.4 The Norwegian offshore standard contracts NF 05, NTK 05 and NTK 05 MOD	23
3.4.1 The standard contracts in general	23
3.4.2 NF 05	24
3.4.3 NTK 05	25
3.4.4 NTK 05 MOD	25
4. Brief presentation of relevant theory	27
4.1 Contract strategy	27
4.2 Incentive theory in contracts	30
4.3 Turn key contracts (EPCI/EPC)	32
4.4 Multiple primes contracts (E+P+C+I)	33

4.5	Frame agreement	33
4.6	Remuneration schemes.....	34
4.6.1	Fixed-price/ Lump sum	35
4.6.2	Reimbursable payment.....	36
4.6.3	Target budget.....	37
4.6.4	Unit price and hour rate.....	39
4.6.5	Remuneration in accordance with spot-price	40
4.6.5.1	Spot price on raw materials as a remuneration scheme	40
4.6.5.2	Spot price on oil as a remuneration scheme	41
4.7	Variations	42
4.7.1	Variation orders.....	42
4.7.2	Negotiations about variation work	43
4.8	Adjustment in price, inflation revision.....	44
5.	Examination of the projects BP M&M- UGU and Tampen M&M.....	46
5.1	Short introduction to the projects	46
5.1.1	Ula	46
5.1.1.2	Ula gas upgrade.....	46
5.1.2	Tampen M&M.....	47
5.1.2.1	Statfjord.....	48
5.1.2.2	Gullfaks	48
5.1.2.3	Snorre	49
5.1.2.4	Vidsund	49
5.2	Project Execution Model (PEM)	50
5.2.1	Aker Solutions operating system.....	50
5.2.2	Project execution model	51
5.2.2.1	Phase 1 Feasibility & Concept	52
5.2.2.2	Phase 2 System definition	53
5.2.2.3	Phase 3 Detailing & Fabrication	54
5.2.2.4	Phase 4 Assembly/Erection.....	54
5.2.2.5	Phase 5 System completion.....	55
5.3	Estimation in M&M projects.....	56
5.3.1	Practical approach with estimation in projects.....	57
5.4	The use of target budget in BP M&M and Tampen M&M.....	58
5.4.1	The use of Target budget in BP M&M	58
5.4.1.1	An analyse of the TB Model and practical experience in the project	62
5.4.2	Target budget in Tampen Maintenance and Modification contract	64
5.4.2.1	The contracts reference to Target budget.....	65
5.4.2.2	An analyse of the TB Model and practical experience in the project	70
5.4.3	The use of target budget over and under the profit-deviation cap	73
5.4.4	StatoilHydro as the client	74
5.5	Frame agreements with subcontractors	75
6.	Discussion.....	78
6.1	Discussion Target budget	78
6.1.1	The structure of a Target budget	79
6.1.2	The mathematical formula for profit within agreed cap	79
6.1.3	Example of the structure of a target budget in piping:.....	80

6.1.4 Why the estimated target budget (ETB) is important:	81
6.1.5 Variations and handling of variations	81
6.1.5.1 The use of non-weight variations	82
6.1.5.2 The use of weight related variations	83
6.1.5.3 Variations in general	83
6.1.6 Establishing cap.....	84
6.1.7 The use of cap in the target budget model	84
6.1.7.1 The downside in case of overrun.....	85
6.1.7.2 The upside in case of underrun	85
6.1.8 The Target budget and basic fundamentals in the concept	86
6.1.9 Anecdote, the use of target budget model in Google's advertising campaigns	87
6.2 Discussion Spot price	88
6.2.1 The use of spot price remuneration scheme	88
6.2.2 The change in price, theoretical approach.....	90
6.2.3 Spot price on raw materials as a remuneration scheme	91
6.2.3.1 Practical approach in spot price on raw materials as remuneration scheme	92
6.2.3.2 Example of use	93
6.2.4 Spot price on oil as a remuneration scheme.....	94
6.2.4.1 Brief about the Norwegian surtax system for oil business.....	94
6.2.4.2 Practical approach in spot price on oil as remuneration scheme.....	95
6.2.4.3 Example in use	96
6.2.5 Spot price on raw- materials and oil as a remuneration scheme	97
6.2.5.1 Example in use	97
6.2.6 Spot price as an alternative remuneration scheme in AOP's contracts.....	98
7. Conclusion.....	99
7.1 Target budget.....	99
7.2 Spot-price	100
7. References	101
Appendix	104

List of figures

Figure 2.1: Illustration of the relationship between reliability and validity.....	16
Figure 3.1: Aker and subsidiary companies	21
Figure 3.2: Aker Solutions operating business.....	22
Figure 4.1: Summing up relevant elements to establish a contract strategy.	27
Figure 4.2: Circumstances in a specific contract strategy	29
Figure 4.3: Economic incentives (Hetland and Fevang, 1997)	30
Figure 4.4: Outlines in the target budget model.....	38
Figure 5.1: The Ula installation.....	46
Figure 5.2: The Tampen area	48
Figure 5.3: Aker Solutions operating system.....	50
Figure 5.4: PEM Modifications.....	52
Figure 5.5: Strategic level	52
Figure 5.6: Phase 1 Feasibility & Concept.....	52
Figure 5.7: Phase 2 System definition.....	53
Figure 5.8: Phase 3 Detailing & Fabrication.....	54
Figure 5.9: Phase 4 Assembly/Erection	54
Figure 5.10: Phase 5 System completion	55
Figure 5.11: The estimation loop describes the dynamic process of estimation in AOP.....	56
Figure 5.12: Initiated target budget model in BP M&M.....	61
Figure 5.13: The target budget model in BP M&M.....	62
Figure 5.14: The mathematical principle in the target budget model in BP M&M.....	63
Figure 5.15: Initiated target budget model in Tampen M&M.....	69
Figure 5.16: The target budget model in Tampen M&M.....	70
Figure 5.17: The mathematical principle in the target budget model in Tampen M&M.....	71
Figure 5.18: Profit-deviation cap Tampen M&M	73
Figure 5.19: Frame agreements, added value in order of priority	75
Figure 6.1: TB model without calculated and adjusted non-weight variations.....	82
Figure 6.2: TB model calculated and adjusted for non-weight variations	83
Figure 6.3: Historical steel price on plates, beams, CRC, HRC and average	89
Figure 6.4: Interactive map of the Norwegian Oil & Gas “World-Class” Cluster.....	91
Figure 6.5: Historical oil price graph, US dollar per barrel	95

List of tables

Table 2.A: Some concept within quantitative and qualitative research (Ryen, A. 2002)	15
Table 4.A: Short evaluation of the remuneration schemes	37
Table 5.A: A structure orientation of the target budget model	68
Table 5.B: Target budget settlement in Tampen M&M.....	72

Abridgements and specification of word

<u>Notion</u>	<u>Explanation</u>
” (inches)	Dimension on pipes measured in inches (1” is ca. 25mm)
AOP	Aker Offshore Partner
BP	Beyond Petroleum, Oil company, former British Petroleum
CAPEX	Capital Expenditures
Esso BSSA	Esso Broad Scope Services Agreement
EPCI	Engineering, Procurement, Construction and Installation
HSE	Health, Safety and Environment
LCC	Life Cycle Cost
LCP	Life Cycle Profit
LD	Liquidated damage
LNG	Liquefied Natural Gas
MC	Mechanical completion
MOD	Modification
MMcf/d	Million standard cubic feet per day
MMO	Maintenance Modification & Operations
NCS	Norwegian Continental Shelf
NF	Norwegian Fabrication Contract
NOK	Norwegian kroner (MNOK= Million NOK)
NOU	Norwegian Puplic Review
NTK	Norwegian Total Contract, (from Norwegian; Norsk Total Kontrakt)
NTK MOD	Norwegian Total Contract Modification
OPEX	Operating Expenses
PEM	Project Execution Model
Shell NISC	Shell Norwegian Integrated Service Contract
SSB	Statistics Norway, (from Norwegian; Statistisk Sentralbyrå)
TB/ETB/FTB	Target budget, Estimated Target Budget, Final Target Budget
VO	Variation Order
VOR	Variation Order Request
UGU	Ula Gas Upgrade
UiS	University of Stavanger

Specification of words

Incentives are mechanisms that are used in contracts to make the supplier allocate his resources and method of operation to contribute to improve the result of the project. A good result demands that the parties have a joint vision on the effect of the incentive scheme. These should be easy to evaluate and manage.

Methodology is the teaching in social science research methods.

Owner is one who pays money for materials, products, or services to others. In incentive theory often referred to as the principal.

Operating system is the basic management system to operate a business, often consists of guidelines and procedures.

Procurement is acquisition of goods and/or services at the best possible quality, at right quantity and time, in the right place and from the right source. Simple procurement may involve nothing more than repeat purchasing, and a complex procurement could involve finding some long term partners.

Subcontractor is one who takes a portion of a contract from the principal contractor or from another subcontractor. An individual or company hired by a general or prime contractor to perform a specific task as part of the overall project.

Supplier is one who supplies materials, products, or services to others. Other words for the supplier can be contractor. In incentive theory often referred to as the agent.

Spot price is the selling price in the market at a particular time.

1. Introduction

In this chapter the background for the thesis is described, as it is the closure of my five years University degree. The delimitation both within practical approach and the academic content is presented followed by the structure in this thesis.

1.1 Background for the thesis

When the problem to address should be selected for the thesis I wanted to write within the oil and gas industry. In Norway this is the largest industry, and Stavanger where the University is located is the national center for this industry. A large number of companies in the industry, both oil- and supply companies are located here and many people in the region have there daily work both onshore and offshore. Since the thesis also is the last obstacle before I am done with my Master degree I also wanted to look at the opportunity for further engagement in the oil and gas industry.

Trough my studies in both contract accomplishment and strategy and related courses, I have been fascinated with the strategy and incentives that are made in business. The target budget model touch upon this things and are widen used in the industry but not been much research on. I contacted Aker Solution, and together with them I built up a sketch for the problem to be addressed. After some guidance from professor Osmundsen, the instructor at the University, I got a good problem to address. I wanted to look in to the target budget model, get better knowledge and in the same time lock at it with a critical view. How the contract is designed, and what incentives that are included have a strong influence on the economic outcome of the project for both parties in the contract.

Modern contracting theory and the oil companies prefer designing contracts with incentives for the supplier to save money when executing the project. The target budget model gives these types of incentives. Aker Solutions as a supplier company within the industry execute several of there projects remunerated on basis of the target budget model, with various results.

I wanted to look in to the whole process of establishing the model, practical experience, take some experience and try to draw some concluding remarks.

The activities in the oil industry is highly affected by the price of oil, and in the last year the oil price was at a all time high, before the price fell rapid to the lowest price in a 5 year period. It was not only the oil price that was at an extreme high level, but also the price of raw materials and services in general in the industry. This volatility prices on raw materials have lead to the work towards a remuneration scheme that take in consideration the raise or fall of prices on input factors in the project.

1.2 Approach to the problem and delimitation of the thesis

With this thesis I want to focus on the following:

Objective in problem 1, the target budget phase

Get better knowledge of the target budget model in contracts. Look at the use of target budget as a remuneration scheme in projects. Get the practical approach with a critical view, examine conditions for establishing the cap, look in to strong sides and weaknesses, to if possible come up with suggestion for improvement and commercial awakening.

Objective in problem 2, the spot-price phase

Introduce a new remuneration scheme based on spot-price regulations. Verify the model for practical use. Relate it to the fluctuating marked of raw materials, and find reliable markets and sources to integrate in the use of spot-price regulation.

From this the following title of the thesis is presented:

“An analysis of the Target budget model and related processes in Aker Solutions offshore projects, and an alternative approach with a new remuneration scheme related to spot prices on input factors.”

Delimitation of the thesis

Aker Solution is involved in lot of contracts, and I narrowed the thesis down to two contracts. Still one M&M contract can consist of over 200 projects or orders. I looked at the two cases and the use of the target budget model. The examination of the contract was narrowed down to the target budget part since the contracts is large comprehensive documents. In the practical use I also focused on the remuneration model, but need some basic knowledge to the project in addition to the remuneration schemes. I wanted to avoid this being an accountant thesis, so I looked at the overall use, and not so deep in to the financial results and outcome of the projects.

In the spot price remuneration scheme I have come up with a new idea for a remuneration scheme. I tried to verify the use and come with some practical approach and examples. The remuneration scheme need to be customised to the project it shall work in. In that way I have only come up whit the practical approach and some guidance, and tried to verify the model for use in Norway with the Norwegian taxation system.

The thesis delimitation is also based upon requirements and regulation from the University connected to Master's thesis within 30 ECTS and corresponds to a full semester of work at a Master degree level. The thesis has to be handed in at the latest 15th of June 2009.

1.3 The structure of the thesis

I have chosen to structure the thesis in three parts

Part I Introduction to the problem

This part consists of chapter 1 to 4. The problems that are studied further in the thesis are presented. First is a short description to the background for the thesis, relevant information about the company and used method, followed by the Norwegian standard contract and at the end a chapter deal with the theory that is relevant to the thesis.

Part II Case study

This part consists of chapter 5. Here are the analysis of the case from ongoing projects, and description of results from the analyses.

Part III Discussion and conclusion

This part consist of chapter 6 and 7. Here are results of the analyses discussed, and this part is finished up with a conclusion of the things that have come to light during the study.

2. Method, the selection and use

In this chapter a short introduction to the general use of method and the characterization of some relevant methodology are presented. The method shall secure that the information in the thesis is relevant, valid, and are correct and systematic treated and stored. In the end of this chapter it is presented and described the thesis method for overtake and store literature and information.

2.1 Method – an introduction

Methodology is not a goal in it self in this thesis, but an instrument to achieve goals of research-based character. According to Holme and Solvang (2003) methodology gives us a foundation for systematic and methodical work with what, why and who that are connected to the problem in the thesis. The understanding of method is a criterion to be able to accomplish serious research work.

2.2 What is then a method?

A method is a technique to come up with a new acknowledgement or validate an already known acknowledgement. There is no best practise when it comes to selection and use of method. It is fundamental that every method have to be adjusted to the specific problem. The method shall secure that the information in the thesis is relevant, valid, and are correct and systematic treated and stored. The selection and use of method will be an important element to assure quality in the thesis.

2.3 Methodical approach

Principally we have two methodical approaches in social science; quantitative method and qualitative method. It do not exist an absolute partition between these approaches and can more be described as opposite parties on the same scale. The approaches are not in competition with each others and according to Creswell (2009) they can on the other hand be complementary to each other with there strong and weak sides, and to be used in a mixed

method. The selection of methodical approach is more a question about overtaking of the right type of information. Therefore are the methodical approach not a principle, but a strategic choice based on the problem, recourses and potential experience with research.

Still it exist a significant difference between the two methodical approaches. The quantitative method converts data in to figures and quantities, and from this statistic analyses are carried out. While in qualitative method it is the researchers understanding and interpretation of the data that is the basis, in such a way that it do not need to be quantified. A third methodical approach is literature study that consists of identifying and examine literature within central subjects related to the problem and the selection of sources and reference material.

Table 2.A: Some concept within quantitative and qualitative research (Ryen, A. 2002)

Quantitative research	Qualitative research
Deductive	Inductive
Test of hypothesis	Develop of hypothesis
Nomothetic	Ideographic
Cumulative	Incompatible paradigm

2.4 Requirements to the information and data

2.4.1 Reliability and validity

The information that is collected has to be reliable and relevant for the subject. It is important to look at the reliability and validity of the information that are presented. If a sampling that are unreliable or invalid is used it is most likely to have errors in the total result.

2.4.1.1 Validity

Validity is related to whether used methods, approaches and techniques can really relate to, or measure the examined problem. Validity depends on *what* that are measured and the accuracy in the results. The problems with validity arise if what is measured not are in direct

connection with the problem. The validation problem often arises because the researcher has to work in two levels; the theoretical level and the empirical level. One work at a theoretical level when problem are approached, does demarcation and defines concepts. The measurement process on the other hand is at an empirical level. The concepts that are used in both levels have to be in correspondence with each other. To achieve a successful piece of work it is important to link together theory and practical experience. According to Grenness (2001) the validity to a search are related to:

- The measuring instruments ability to measure exact what is the attention to measure
- Information collected from the measurements
- The result from the search
- The interpretation of the results

2.4.1.2 Reliability

The question if the information fulfils the demand for validity can not be discussed without including reliability. High reliability is a condition for validity. In this is *how* the measurements are done. The reliability can be related to consistent results. A measurement is regarded as reliable if it gives us the same result several times, and obtained object are not changed in the meantime. The most important factor to secure high reliability is the knowledge in use of methods, and it can be useful to do a pre-test of the measuring.

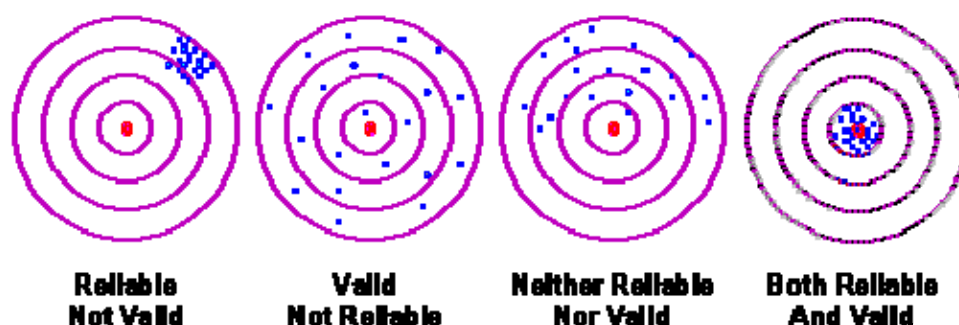


Figure 2.1: Illustration of the relationship between reliability and validity

In figure 2.1 the relationship between reliability and validity are tried explained.

- In the first disk the target are hit consistently, but the center of the target are missed. There are consistently and systematically measured wrong values for all respondents. This measurement reliable, but not valid.
- In the second disk shows hit that is randomly spread across the target. The center is rarely hit, but on average the right answer for the group is obtained. In this case it is a valid group estimate, but inconsistent. It is easy to see that reliability is direct related to the variability of the measure.
- The third disk shows a case where the hits are spread across the target but the center is consistently missed. The measure in this case is neither reliable nor valid.
- The fourth disk are consistently hit the center of the target. The measure is both reliable and valid.

2.5 Sources of error

According to Grenness (2001) there are two main types for sources of error; error in the measuring and error in the samples. Error in the measuring are related to the handling of large amounts of data, or when data is collected from a large number of sources, which primarily affects the reliability. Since normally just an abstract of relevant sources is examined, it is normal to have so-called sampling errors and these are inevitable.

2.6 Requirement for the use of methods

When empirical questions are addressed they relate to reality. The word empirical means knowledge based on experience. Within science it is certain standards to follow when you seek answers:

- The results have to be in correspondence with reality.
 - After the problem is identified, it is important to prepare a control over the examination. When examinations are done we want the results to show the actual conditions. There is not a goal to prove that the initiated assertion is correct.

- The information need to be systematic collected
 - Systematic samples are obtained by examining representative samples within the holders of the relevant information. To do sampling within the interest of the problem area are strategic sampling. The selected information has to support the questions you want answers to. There must be given an explanation for how the sampling was selected to indicate that it not was taken to present a certain result.
- The results must be verifiable
 - The results have to be presented in a way that allow a critical view, control and testing.
- Value-neutrality and objectivity
 - It is difficult, and sometimes not possible, for a scientist to do a neutral evaluation. It is important that the personal, political or professional level don't influence the research work to much. Objectivity is important to prevent personal influence on the results.

2.7 Selection of method in this thesis

The defined problems in this thesis consist of two problems of unlike structure. I have thereby chosen methods that are best suitable for the uniqueness of the problems.

Target budget phase

Get better knowledge of the target budget model in contracts. Look at the use of target budget as a remuneration scheme in projects; get the practical approach with a critical view, examine conditions for establishing the cap, look in to strong sides and weaknesses, to if possible come up with suggestion for improvement and commercial awakening.

Spot-price phase

Introduce a new remuneration scheme based on spot price regulations. Verify the model for practical use. Relate it to the fluctuating marked of raw materials, and find reliable markets and sources to integrate in the use of spot price regulation.

Since the nature of the two phases is unequal, the methods will be so as well. In the target budget phase I have used a mixed method of quantitative and qualitative approach, and in the main quantitative method. I have used two individual contracts and examined the use of target budget, but also done qualitative interviews with persons related to the projects. In the spot price phase I have used a combination of quantitative and qualitative method, and in the main qualitative method. This phase involves an innovative approach, and method of research that can be described as developing of hypothesis.

In general the method selection consists of determine the approach to reply to the problem and demands an evaluation of the most suited method. It can be stated that the selected method provides the qualified assumptions for the thesis, when a completed examination can not be changed or improved without significant extra work.

The method will also include a literature study to bring out the literature that is most relevant for the problem and select what are to be sources and references in the thesis. It will mainly be focused on known literal work and authors, but an innovative thinking from not that well known author will give the thesis originality.

2.7.1 The methodical use in this thesis

The use of method has for its object to set the selected method out in practical use, as in this thesis involve go through with literature study, prepare interviews, go through with interviews, analyse and present discoveries and results. The use of method shall secure that the collected information in this thesis is being systematic treat and stored to assure the quality of the data and ensure the verification principle.

The interviews in the target budget phase have been of an unstructured character, and consisted most of questionnaires and discussion with people that have been part of the tender process and the people managing the awarded contracts. This has been a very useful method in order to collect data that most likely is not possible to get from other techniques like observations and questionnaires. The unstructured interview can be described more or less as an open conversation. The strength with this type of interviews is that the person that is

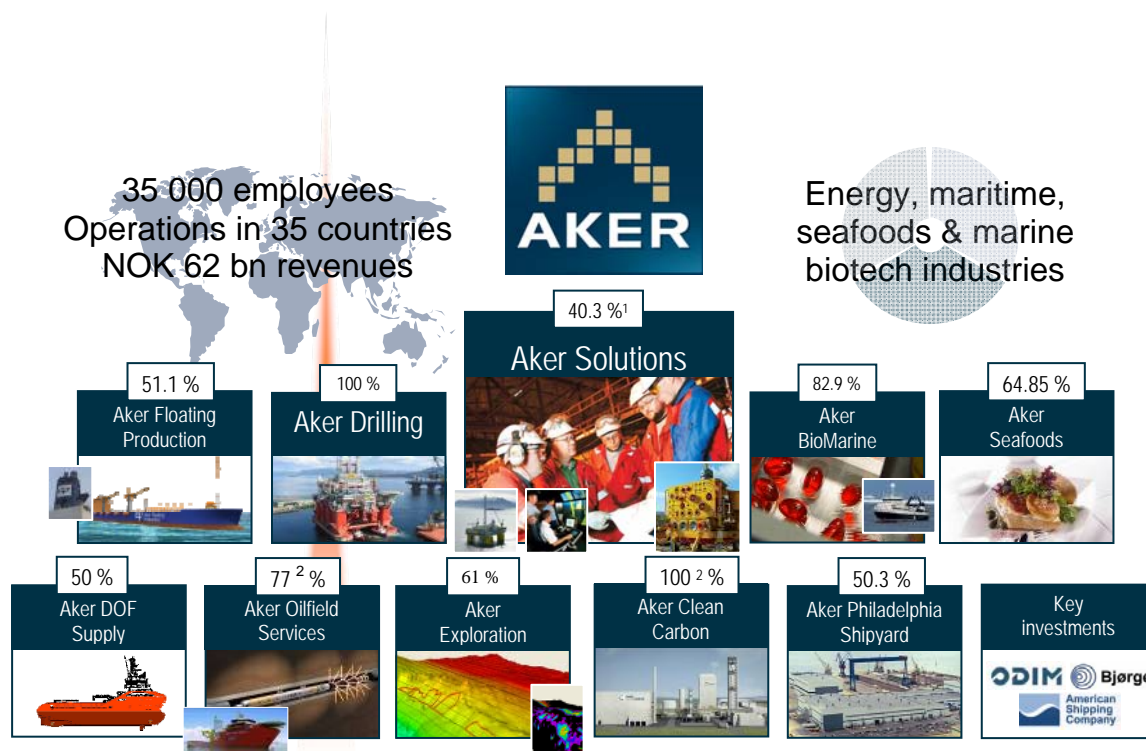
interviewed can express him self freely without being forced in to a specific mindset. The verification in this phase is references and link to the project and contract.

The developing of hypothesis in the spot price phase has involved from problems in times when prices varies a lot. The hypothesis has an innovative approach and taken in consider known practise and literature within the procurement field, the Norwegian tax system and business practice within the Aker system. The verification here is the correspondence with the Norwegian oil taxation office.

The use of relevant literature has been an important remedy to carry out the thesis. The amount of theory within the problem areas is limited, but I have researched relevant articles addition to procedures and internal documents, reports and presentations within the Aker system. The carried out literal study have been done in both AOP's internal library, the project reports and at the University library at UiS. This has resulted in core literature for the thesis, which is presented in the list of references.

3. Presentation of facts

In this chapter Aker Solution, the company this thesis is written in, are introduced. It is also presents the operating businesses within Aker Solutions and Aker Offshore Partner as a subsidiary, followed by a brief presentation of the Norwegian standard contracts that are widely used at the Norwegian continental shelf.



Aker ownership shown (in %)

¹ Held by Aker Holding

² Including shares owned by Aker Solutions

Figure 3.1: Aker and subsidiary companies

3.1 Aker Solutions

Aker Solutions is a leading provider of engineering and construction, technology products, execution, service and integrated solutions for the oil and gas and process industry. In the company it is approximately 23 000 employees and 10 000 agency workers in around 30 countries, and had an operating revenue of 52 billion NOK in 2008.

The history of the company goes back to Oslo in 1842 with the founding of “Aker Mekaniske Verksted” and in 1853 the founding of “Kvaerner Brug”

The two companies have had many business areas in the years, but have had a strong focus on the oil and gas industry since the Norwegian oil adventure in the early 1970’s. The companies merged in 2002 and founded Aker Kvaerner, who in 2008 announced its new name Aker Solutions.

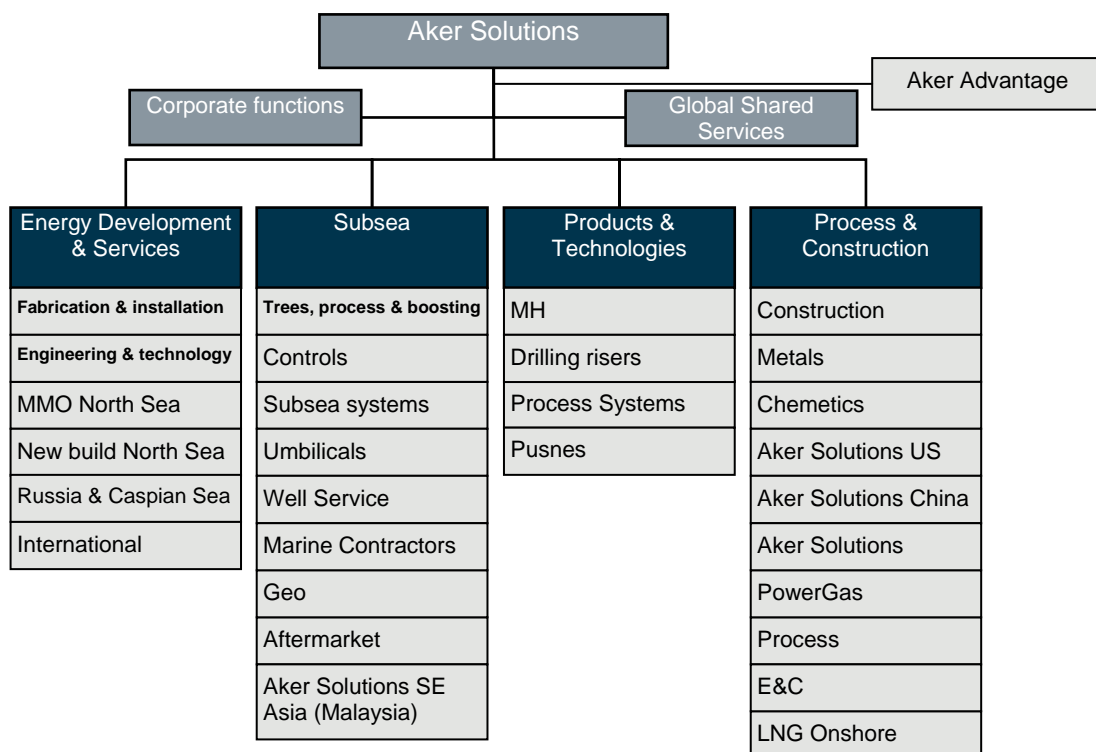


Figure 3.2: Aker Solutions operating business

3.2 Aker Offshore Partner

Aker Offshore Partner AS (AOP) is a wholly-owned subsidiary of Aker Solution, and operates under Energy Development and Services inn the segment MMO North Sea. AOP is a turnkey contractor for the oil and gas industry. The company is engaged in front end studies, field development with new platforms, modifications to existing platforms, maintenance, operations and field decommissioning and removal. AOP covers all engineering disciplines, procurement, material administration and project management. The company has some 2 500

employees including region offices in Bergen, Kristiansund and Stjørdal, and the head office who is located in Stavanger, Norway.

Of the 2 500 employees is approximately half of the staff operators in both the manufacturing workshop and offshore, the rest of the staff is administrative employees, like engineers, project support and management and finance.

3.3 Aker Offshore Partners different contracts

AOP is in present time involved in different types of contracts. In new build is the Kashagan project in the Caspian Sea, major modifications is Statfjord late life, Oseberg drilling upgrade and Valhall Re-development. In Maintenance and modification is the Tampen contract with StatoilHydro, BP M&M, Esso BSSA, Shell NISC and in decommissioning Frigg cessation project. In addition to this AOP have a large study division who does do pre-studies (pre-engineering) for oil companies. The pre-studies will determine on an early phase if the concept is worth developing or not, and the expected costs of development and execution. All these different contracts have various remuneration schemes, all from lump sum, to rates, to completely reimbursable remuneration.

The different contracts also involves a various phases, all from just engineering phase (E), to large general contracts (EPCI), where all parts of the organisation is involved in the project.

3.4 The Norwegian offshore standard contracts NF 05, NTK 05 and NTK 05 MOD

3.4.1 The standard contracts in general

Statoil, Hydro, Saga and the National Association of Technology Companies, now Federation of Norwegian Industries, have negotiated standard contracts to be used on the Norwegian Continental Shelf. Principally we have the Norwegian Fabrication contract, NF 05, and Norwegian Total Contract, NTK 05. The latest bloomer to the standard contracts is Norwegian Total Contract Modification, NTK 05 MOD. The first type of these contracts was NF 92, and this have evolved and developed to the contracts mentioned above.

The gains of standardisation are saved time and cost for the parties with establishing common practice and rules that both parties know well. The standardisation make the transaction cost lower and save time you don't have in a tender process.

Most contracts need a certain degree of individual contents. Every contract need to take in consideration the circumstances on every single scope, what type, size, the parties' interaction and so on. The contractual attachments ought to be individual, but it is often most suitable to have the general contractual conditions standardised.

The elementary rules about dividing of risk are too important and difficult to be discussed in every single contract negotiation. These rules have to be set on a methodical basis. The question about risk is in the end depending upon every single contract. The effect of the elementary rules in the contractual terms is depending on the contracts requirement to execution, price, time schedule etc.

All the Norwegian standard contracts focus on progress by the plan and related milestones. The administration of variation, errors, warranty and incurrence is clearly defined and so is the reasonability. The delivery and payment are regulated, and systems, routines and procedures for organisational and administrative work are defined. The contracts also regulate work on running installations and HSE matters.

3.4.2 NF 05

For fabrication of larger devices to the oil and gas industry on the Norwegian continental shelf NF 05 is used. Norwegian Fabrication contract applies for StatoilHydro and Norwegian Industry association. In all contracts with large devices that are agreed between StatoilHydro and a member company of the Federation of Norwegian Industries, like AOP, shall NF 05 be applicable. Other companies also use NF, but then often with small adjustments.

The cause for composing the standard contract was to simplify the contractual process for both parties. The standardisation also involve the possibility develop technical and good commercial balanced contractual terms.

NF 05 is an extensive document with 37 articles. The structure has common features from the Anglo-American contractual administration, which is; detailed provisions and definitions, wide focus on contractual administration and frequent use of cross references. Since it is a Norwegian standard contract the terminology and the systematic processes show signs of Norwegian contract law.

3.4.3 NTK 05

This standard contract is applicable for all larger project tasks with engineering, procurement, fabrication and installation, EPCI contracts. NTK was also initiated by the same organisations like NF, and was developed since the use of NF was not adequate for use in larger development projects. NTK 05 is an extensive document with 38 articles on 44 pages.

3.4.4 NTK 05 MOD

This standard contract is applicable for all larger project tasks within modification of oil and gas installations on the Norwegian continental shelf. The contract in itself is very similar to the NTK, but especially regulates the offshore activities in contract. NTK 05 MOD is an extensive document with 38 articles on 51 pages.

4. Brief presentation of relevant theory

This chapter presents general theory within contracting, the contract models, incentives and the most used remuneration schemes. Variations in contract are explained followed by the introduction to the new remuneration scheme based on spot prices and indexation in general.

4.1 Contract strategy

The strategy of a project shall describe how the project overall is executed to reach the goals and targets in a best possible way. The unified project strategy can consist of several sub-strategies which have a certain relevance to each other. The most common strategies are; carrying out strategy, contract strategy, communication strategy and directing strategy.

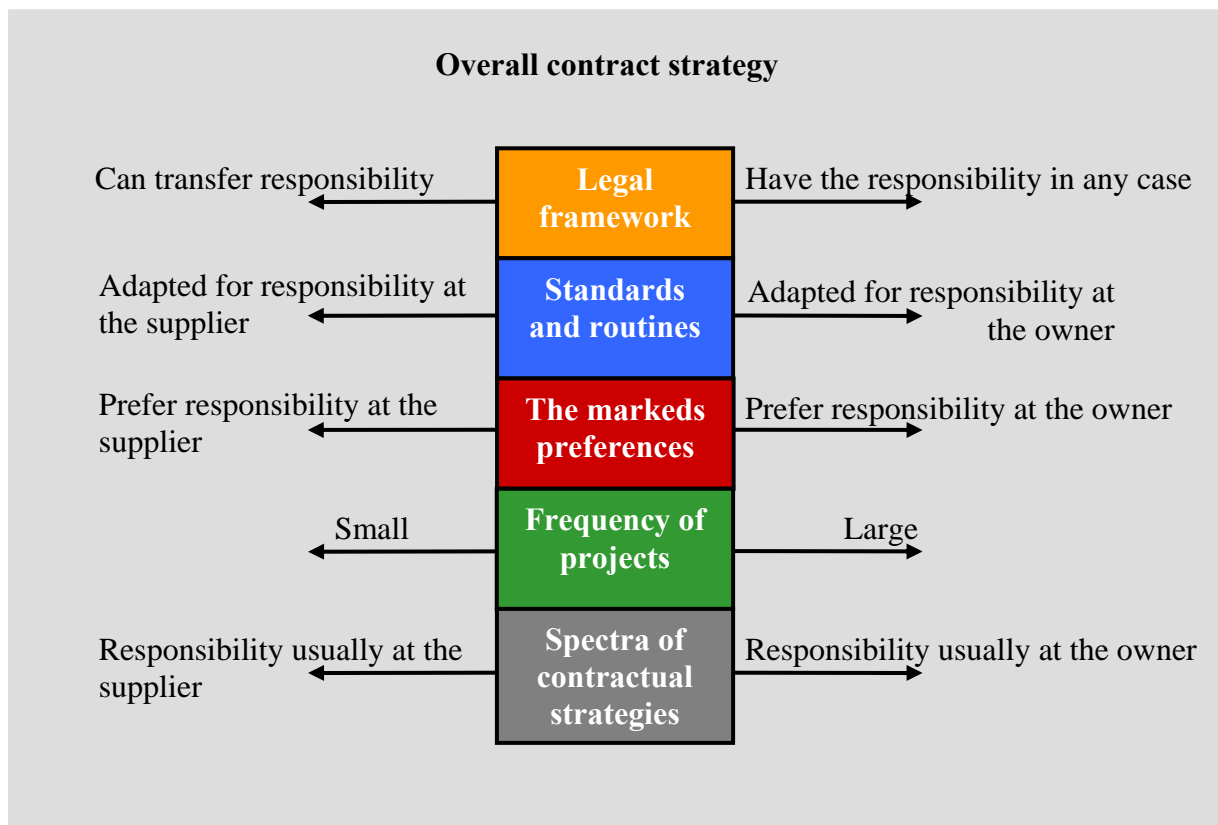


Figure 4.1: Summing up relevant elements to establish a contract strategy.

The contract strategy will describe how to secure appropriate competition in the selection phase, how to divide assignments, reasonability and uncertainty, and what kind of contractual instruments that is established to support the control and management in the execution phase. The theory often refers to two types of contract strategy, general and specific strategy. The general contract strategy is for the business in general, while the specific is for the single project.

The strategy that is brief presented in this chapter is linked to the owner and the supplier, as two parties in a contractual relationship. Owner is the one that have taken the initiative for the process and wants to pay the supplier to do work. The supplier is undertaken the owner and wants to do a certain type of work or provide services for money. The specific contract strategy will depend on a broad spectre of elements like the relationship between this two parties and there abilities and competence. Depending on these things, the contract strategy is established and carried out.

The contract theories recommend customising the strategy to the single project. It is not possible to objectively define what the correct solution at all time is, but it is possible to give guidance to what strategy that can be uses under given circumstances. Strong cost controls are important in straitened circumstances, and contractual flexibility is important when final outcome is unknown or the technical challenges are great.

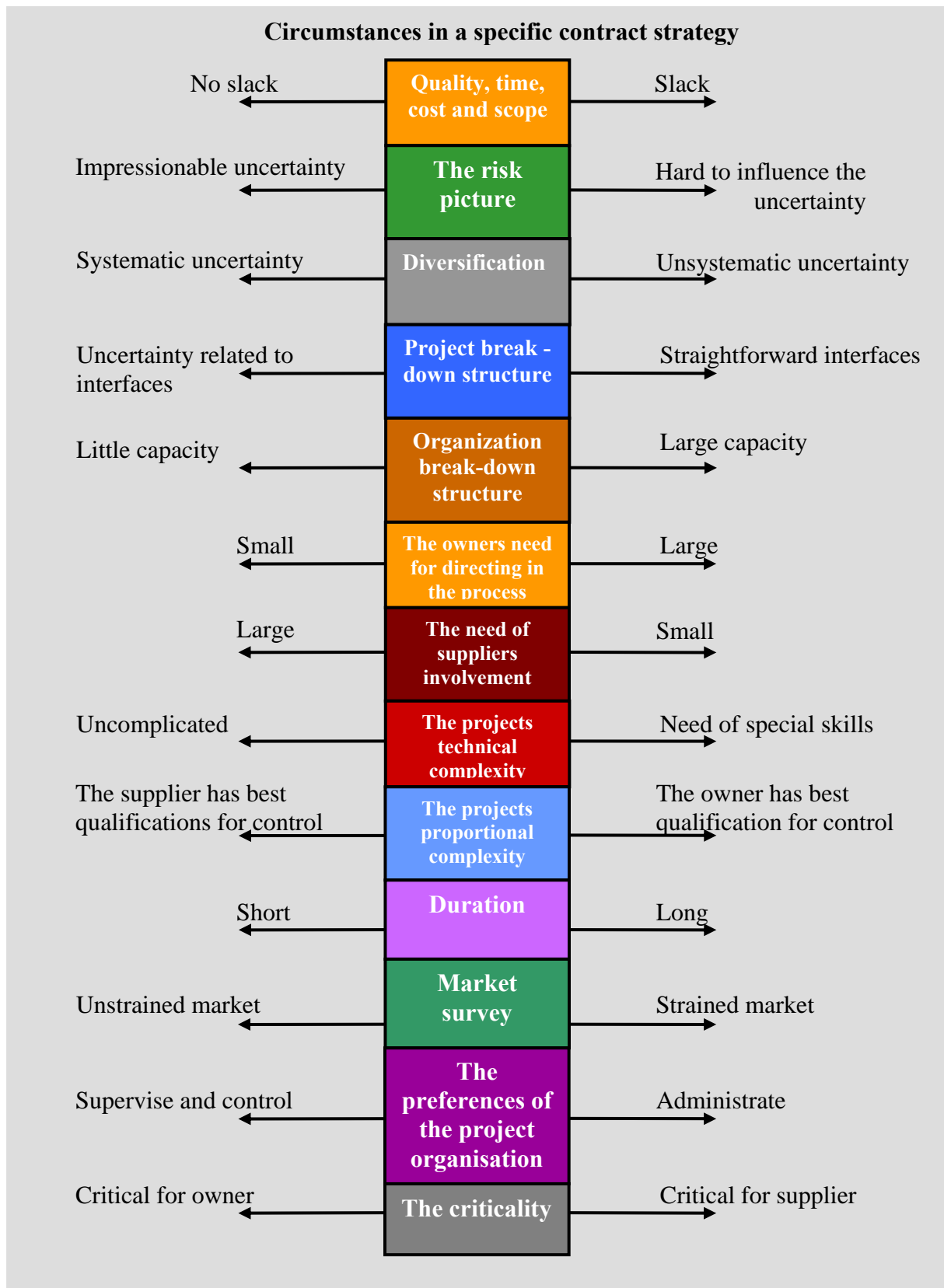


Figure 4.2: Circumstances in a specific contract strategy

4.2 Incentive theory in contracts

Incentive is mechanisms that can be used in contracts, and have the intention to make the supplier allocate his resources and method of operation to improve the result of the project. A good result demands that the parties have a shared view on the impacts of the incentive scheme. The incentive schemes have to be easy to evaluate and manage.

General incentive regulates the interaction between the two parties in the contract, the owner and the supplier. In contractual relation we can relate to two extreme points, the conventional contracts with a large distance between the two parties, and the other extreme point, an alliance where the parties have a close collaboration. In the middle of the two points of view is the rational contract. The parties have frequent collaboration, but stick to the distribution of responsibility that is drawn in the contract.

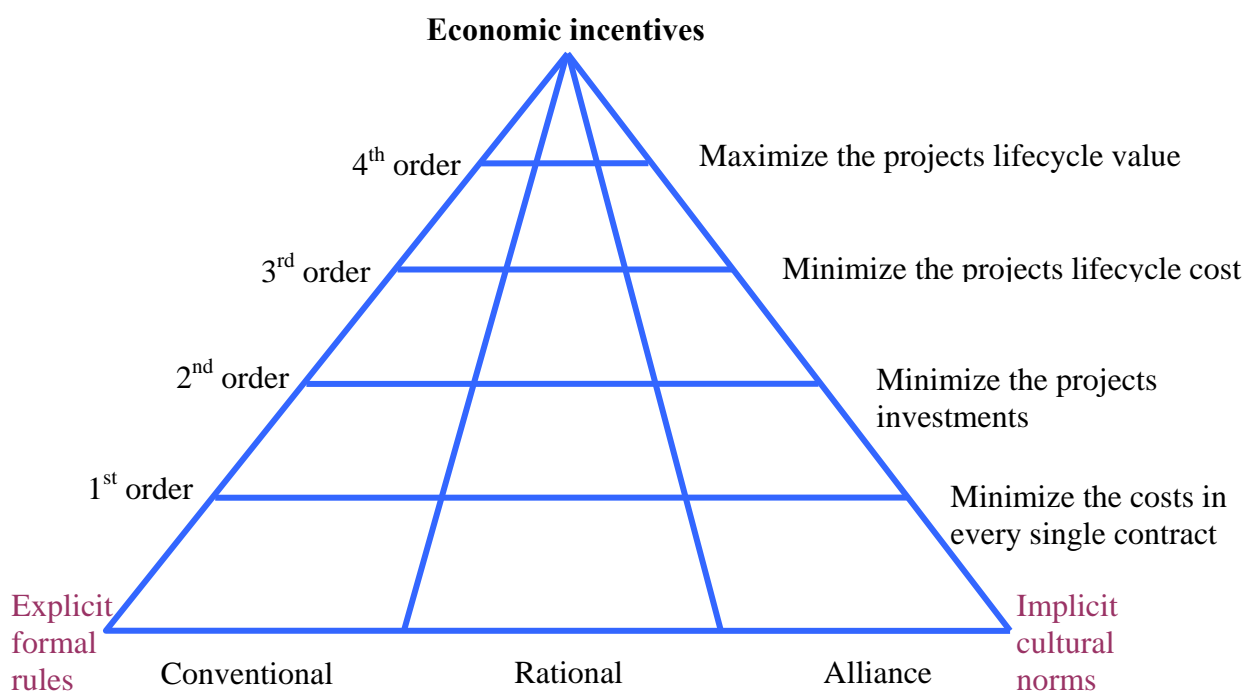


Figure 4.3: Economic incentives (Hetland and Fevang, 1997)

In the selection of incentive scheme to be used, it's important to keep in mind the owners objective, the parties ability to bear risk and the remuneration scheme. One of the extreme points the incentive scheme is linked to minimize the costs in every single contract, and in the other point the incentives is linked to maximizing the projects lifecycle value.

The incentive intensity in the contract depends on the owners request to influence the suppliers work and the importance of the result of the work, often with a specific goal or milestone.

In a contract the incentive intensity is to be frequent when:

- The supplier has a low risk aversion. If the supplier has a low risk aversion he will accept an incentive based compensation without demanding a high risk premium.
- The additional effort from the supplier is very profitable for the owner.
- The owner can measure the supplier's performance with high precision. If the performance is hard to measure, the supplier face a risk related to the measuring, and will demand a risk premium. Possible measuring errors, in the supplier case, can result in additional conflicts.
- The supplier's performance responds strongly to the economic incentives.

Optimal use of incentive systems in contracts can align the interests of the parties; make the supplier keep the cost low, and the quality high. If the project evolves different then the incentive system assumes, the incentive can accelerate the costs in the project.

Common sense will tell that suppliers with limited profit and financial strength would be risk averse, but these often take a bigger share of the risk then what is logical. This happen both in straitened times when supplier fight for work, but also in times when suppliers are "drowned" in work.

4.3 Turn key contracts (EPCI/EPC)

This type of contract gives the responsibility for the execution of the project to one supplier. The model is carried out through the owner's defined functional requirement and the supplier uses his knowledge in the selection of concept. The supplier has the general responsibility for engineering, procurement, construction and installation.

The Norsok process was initiated in 1993 to reduce the cost and execution time at the Norwegian continental shelf. The process concluded in the benefits of involving the supplier in the early phase of the project, and for the owner to have functional requirements rather than complete design. In this way the supplier can come up with a more optimal design, based on the functional requirements.

This type of contract demand good functional requirements and the owner can not interfere in the supplier's execution of the project.

The use of EPCI/EPC contracts is suitable when:

- The functional requirements are well defined
- The technical concept is developed by the supplier
- The majority of the work is done by the supplier
- The market have the capacity, competence and financial strength
- It is possible with competitors in substantial part of the work
- The international marked are attract to the project

The effect of the contract model:

- Uniform responsibility for progress, quality and warranties
- Lower execution time and investment costs
- Few contractual interfaces
- Incentives for general cooperation
- Risk related to higher operating cost
- The detailed of design is just for production
- The design is suited for the suppliers building methods

4.4 Multiple primes contracts (E+P+C+I)

This contracting model is carried out with strong involvement from the owner and he have influence in and trough all phases. It is a large flexibility in the design and execution, but requires high degree of definition for each phase. The owner need knowledge to coordinate the project, control the interfaces and thereby take the risk related to these things.

The use of separate contracts is suitable when:

- Need of flexibility
- Limited competition in the marked, in regard of capacity, competence and financial strength
- Limited competition in regard of important part of the work
- High risk related to project execution

The effect of the contract model:

- Diversification of reasonability, quality and warranties
- Longer execution time and larger investment costs
- Large number of contractual interfaces
- Lack of incentives for cooperation between the suppliers
- Possibility to make the operating costs lower
- The design have to be generalised to fit for a large number of suppliers
- The design have to be take in consider a variety of construction methods

4.5 Frame agreement

A frame agreement is a contract agreement between two parts regarding the delivery of products or services. The agreement is a one-sided commitment for the supplier to deliver within the frames that are agreed in the contract. The delivery within the frame agreement is done after a call-off from the owner. The call-off gives the parties a mutual commitment. A call-off is the order that is made according to the frame agreement.

The intention in use of frame agreements is to get an increased raise of value in the matters of lower administration costs, a shorter execution time for the project, better technical solutions through the involvement of suppliers in an early phase and a standardisation of products.

The products or services that are delivered in the frame agreement could be in a turn key (EPCI) or separated (E/P/C/I) model. The frame agreement and the condition related to it is often described in a extensive contractual document who describe how the parties shall relates to each other, the responsibility of each parties and the authority.

A frame contract is similar to a frame agreement, except the owner commit him self to exclusively use the supplier that are given the contract to do the specific product delivery or services.

4.6 Remuneration schemes

All remuneration schemes have incentives in its natural structure. It is important to be conscious in the selection of remuneration schemes. The different schemes have different risks and direct incentives related too the scheme, and wrong use can result in elimination of critical elements in the task or project. The owner has to be aware that the project execution time often varies in the various remuneration schemes. Aker Offshore Partner does work under different remuneration schemes, and act in the accordance with incentives in the schemes.

According to Lando, Henrik (2008) every transaction entails some degree of trust. Trust is a great aid to any kind of cooperation, but a relationship cannot be built in trust alone when the stakes are important.

4.6.1 Fixed-price/ Lump sum

The owner pays the fixed price stipulated in the contract regardless of what costs the supplier is incurring. The price in its self is often emerged from a bid or offer. The advantage with this compensation scheme is that the final price of the project is more reliable. Amendments and change of scope have often evolved to conflicts and demanding bureaucratic processes.

In order for fixed-price to be the optimal compensation scheme you need detail drawings and make sure that the number of amendments is low.

Items to take in consider and risks that may arise in fixed- price compensation schemes:

- Requirements and specifications can not be considerable changed without vital cost escalation.
- The supplier doesn't have the relevant competence to deliver satisfactory solutions within the requirements, and the owner have to involve beyond the terms and conditions.
- The clauses in the contract or the description of the work have room for interpretation in such away that parties doest not agree. This might result in delays and cost escalation.
- The supplier doesn't have competence to estimate the work scope and don't have the time or capacity to carry out the work. (winners course)

Central risk factors:

- Cost: The supplier doesn't have the incentives to design for cost regarded to operation and life cycle cost.
- Quality: Limited possibilities to influence design, concept and different materials.
- Concept/technology: if not the technical definition degree in the project is on a high level, it might result in endless discussions related to amendments. If the scope of work is not well defined there is a big risk of budget overrun.
- Central risk factors for the supplier:
 - The supplier bears the risk of own progress
 - The supplier bears the risk right specifications within the defined scope
 - The supplier is responsible for the cost estimate within the defined scope

- For both parties a risk factor is the chance of getting involved in a commercial dispute when it is uncertainty related to the projects degree of definition at the time of contract formation.

4.6.2 Reimbursable payment

The supplier is paid for all activities related to executing the project. The outcome of this is an uncertain final price of the project, but less likely to have conflicts regarding change in scope of work and amendments Often a control budget is established to control the work.

Items to take in consider and risks that may arise in reimbursable payment schemes:

- For the project owner:
 - Have the full responsibility and bear all risks related to cost variance from budget
 - Bear less risk related to quality because he can continuously influence the design
 - Bear all the risk of cost efficient design, also related to operating expenses and life cycle cost
 - If time is critical, this remuneration scheme have historical been the preferred solutions for efficient progress
- For the supplier:
 - Bear the risk related to errors and delays.
 - The supplier can have delay risk related to the milestones.

Reimbursable payment schemes have low risk related to legal dispute for both parties.

Table 4.A: Short evaluation of the remuneration schemes

Selection criteria	Fixed price	Unit price	Hour rate	Reimbursable
Project definition	High	Medium	Low	Low
Client Involvement	None	None	High	High
The markets capacity and competence	High	High	Low	Low

Remuneration scheme	Fixed price	Unit price	Hour rate	Reimbursable
The client is responsible for correct	N/A	Quantities	Quantities Norms	Quantities Norms Rates
The supplier bear the risk of correct	Quantities Norms Rates	Norms Rates	Rates	N/A
The risk of contractual conflict	High	Medium	Low	Low
Supplier incentives for cost efficiency	Positive	Positive	Negative	Negative
Supplier incentives for efficient solutions	High	Low	Low	Low
The clients quality risk	High	High	Low	Low
The clients progress risk	Exists	Exists	Low	Low

4.6.3 Target budget

The supplier gets paid related to the outcome of the project in terms of the agreed target budget. Overrun or underrun is shared by the parties in terms of a formula, often with a cap for the supplier's share of any overruns. The suppliers profit relates on the projects final cost, and how good he manage to execute the project with budget. The price format shall be an incentive to reduce the cost of the work and contribute to owner and supplier having the same objective in the execution of the work.

The target budget model determinates the profit for the supplier. It is often an agreed profit with zero over/under run, and a 50/50 distribution of the savings or overrun with a maximum cap for the supplier. The model can be used with both a lump sum, or as reimbursable with non-profit figures in the estimated target budget.

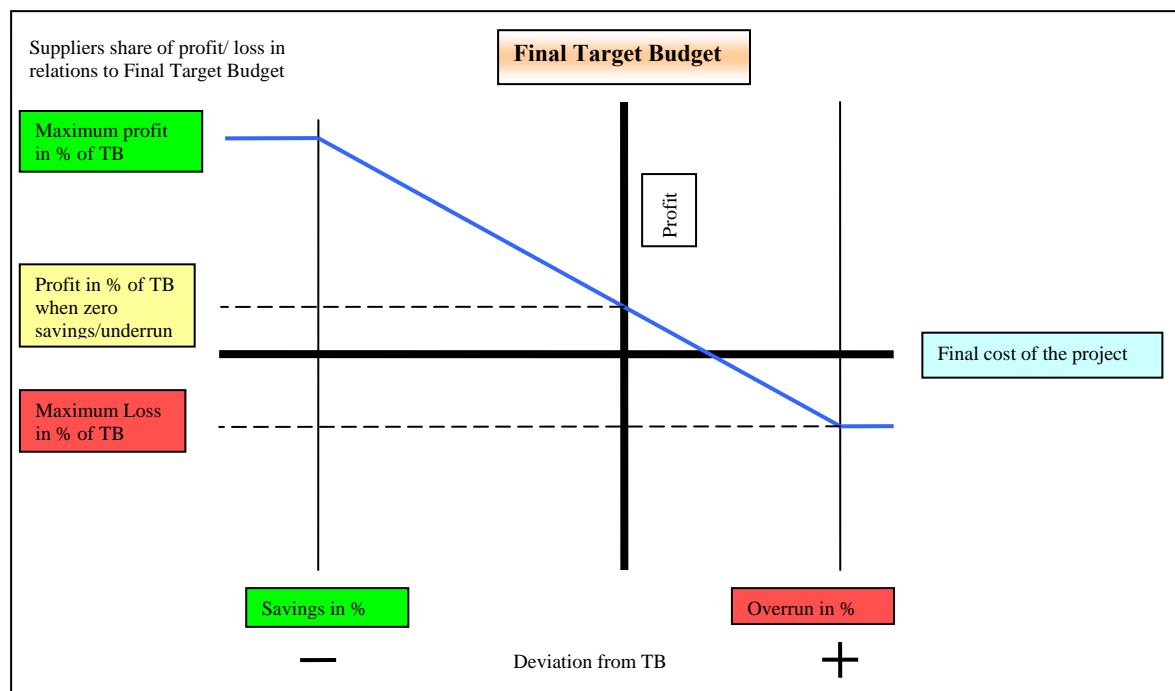


Figure 4.4: Outlines in the target budget model

When the cap is reached for maximum loss in case of overrun, the supplier can not lose any more money on the project. When the cap is reached for maximum profit on underrun, the supplier still can have a larger profit if the final outcome of the project is significant lower then the estimated target budget.

Items to take in consider and risks that may arise in target budget payment schemes:

- For the owner:
 - The quality risk is lower then in fixed-price since target sum assume an integrated team and with that collaboration with optimizing of the design in the entire process.
 - The owner bears the risk of total cost reduction.
 - The use of target budget can complicate a tender process, as the profit distribution often is a result of a negotiation process.

- A historical fact is that suppliers often share the upside of the profit, but can face financial problems or bankruptcy, and not be able to contribute in case of overrun.
- The supplier have a cap for the profit in most cases, and can give priority to more profitable projects.
- For the supplier:
 - The supplier bear the risk related to efficiency and carry through of the project.
 - The supplier has large commercial risk.
 - The supplier have a cap for the profit in most cases, and can give priority to more profitable projects.
 - A cap in profit can result in lower profit in a “best result case” then with other remuneration schemes.

On the basis of the supplier commercial risk often combined with a low degree of specification the risk of a legal dispute is in present.

4.6.4 Unit price and hour rate

Unit price

The supplier gets paid bases on a predefined rate per unit, referred to as norms. These norms are used hours (man hours) per unit, weight, quantity, part etc. The figures are based on theory or experience updated with today’s cost picture. All expenditures for the supplier are estimated and counted in to the unit price.

Hour rate

Hour rate are cost per used hour (man hour). The hour rate often contains all expenditures for the supplier spited up as mark-up percentages added to the cost of a working hour.

The price to be paid by the owner is the supplier set of norms multiplied with the “as-built” quantities and a possible risk mark-up.

Items to take in consider and risks that may arise in a payment by norms compensation schemes:

- For the owner:
 - Quantity risk is in general the owner's risk.
 - The total costs might be higher since the supplier not necessarily has the incentive for optimal design.

- For the supplier:
 - Bear the risk related to the accuracy of rates and norms.
 - Bear the risk for low efficiency and bad quality, but get the upside in case of high efficiency, thereby high incentives for efficiency.

The risk of a legal dispute is in present, but is lower then in use of fixed price or target budget.

4.6.5 Remuneration in accordance with spot-price

The resent times with large changes in raw material prices have initiated this remuneration scheme as a more fair way of regulate the contractual sum. The payment in the contract is set as a function of the spot price of input factor or a function of the spot price on sold product for the owner, here the oil price. These two methods can also be combined, but I have chosen to describe them separately.

This remuneration scheme makes the two parties in the project share some off the up and down sides on factors that are out of there control.

4.6.5.1 Spot price on raw materials as a remuneration scheme

The supplier has big expenses on materials used in projects, and the price of these varies as a function of supply and demand. In periods of strong economic expansion the price might rise beyond all expectations, and can lead to large loss for the supplier. Often in the same period the owner will get more paid for his selling products, oil, with no difference for the supplier.

4.6.5.2 Spot price on oil as a remuneration scheme

This remuneration scheme gives the owner and the supplier a joint platform for income. In general the profits of the two parties have been various in terms of the economic situations.

Example of the use:

Paid sum by the owner is a function of an agreed percentage fixed, and an agreed percentage related to the price of input factors, and possible price of oil.

$$P_s = P_a * (0,6 + 0,4 * SP_i / SP_0)$$

P_s = The total contractual remuneration, Paid sum

P_a = The agreed sum/ rate for remuneration

0,6 = The agreed share fixed, not to be adjusted by spot-price (0,6 just an example)

0,4 = The agreed sum to be adjusted by spot-price

SP_i = spot-price materials or oil in period i

SP_0 = spot-price materials or oil in period 0

It is important that the remuneration/settlement is done often to ensure that the paid sum and actual costs of raw material or sold product is close related.

In Norway the governmental operated firm Statistics Norway, Statistisk sentralbyrå, publish monthly and weekly the price of oil, Brent blend, and other materials related to the industry in Norway. A monthly publication is also the Producer price index, with an own chapter regarding the extraction of oil and natural gas. This is just an example of a reliable source for the indexation related to spot prices.

More used this type of remuneration scheme is discussed further on in chapter 6.2.

In the contracts it is often a segment with regulation regarding the salary and/or inflation or deflation. This is a function of the general price movement and is often a part of contract to reflect the change in prices. It is important to find the price index that reflects the actual costs for the supplier and not just the general price movement in the overall market. The indexes that are published give a price movement indicator of the market segment, but can be too superficial when it comes to prices in a specific work or project.

The remuneration scheme as suggested is for regulating the paid cost in a project. For it to be successful it has to:

- The regulating have to be linked to a credible index
- The index have to be highly relevant to the costs of the project

4.7 Variations

According to Osmundsen P. (1999) a contract is in principle incomplete. It is expected that variations arise in the process of project execution. A contract often gives both parties right to issue variations and describes how the parties shall act when variations arise.

4.7.1 Variation orders

A variation order is a written variation to the already existing contract. The variation order describes the variation of the work that the supplier has to execute, the compensation for the extra work and the extension of the time scope. It is important to distinguish between renegotiation of a contract and variation within the frames of an existing contract. The variation can be initialized by the owner who issues a variation in the first initiated specifications, but also the supplier can come out with variations. The suppliers variations can be variations were the contracted work does not fit in with the actual construction.

It is almost impossible to make a perfect system design, therefore it is expected in every project to have variations to the original design. It is not only in the design that variations may occur, but often also in the terms of the project. This might be environmental requirements, new tax legislations or safety demands. This can lead to a request from the owner to increase

or reduce the quality or quantity. It's important to take in consideration that variation in scope of work is not covered by the regular contingency amount.

Both parties can behave strategic to increase or reduce the total costs. The supplier can put forward more variations than the real foundation, or demand cover of extra cost that not actual occur. The owner can characterise a variation as a function improvement and not a function variation in order to not pay the supplier for the extra work.

According to Clark, F.D. and Lorenzoni, A.B. (1997) the following steps shall be done in a variation order:

1. Establish a written procedure and stick to it.
2. As soon as the procedure is proposed, is the authorised permit made with a temporary estimate.
3. A detailed estimate is made as soon as possible, don't let this congest.
4. Determine the effect on the original project plan.
5. As soon as the variation is estimated an authorisation is given, adjust the original control estimate with cost code and incorporate the time effect on the schedule.
6. If the variation order isn't approved the cost of the preparation of variation order and estimate is added to the engineering budget.
7. Let it be clear in both parties organisations that only written variation orders according to the procedures can lead to variation work.

4.7.2 Negotiations about variation work

What makes the negotiation about variation orders complicated is the fact that the contract is often signed before the actual detailed design is started. This is made to reduce the project execution time and leads to the parties enter into a contract that not regulates all relevant conditions. It is expected that variations occur on the way, and under renegotiations the power structure among the parties in the contract is essential. Good contracts have to contain mechanisms that protect both parties under renegotiations.

Negotiations about variation work are inevitable in large projects in the petroleum business. This negotiation will have element of un-productive and non value added processes that are

destructive for the relation between the owner and the supplier. A great challenge is to reduce the discussions scope in variation orders. It is important to develop a contract and organisation that clearly define the distribution of responsibility.

4.8 Adjustment in price, inflation revision

Most contracts contain a sort of mechanism that adjusts the price initiated in the contract as the time goes by. These mechanisms can be adjustment for inflation or deflation, often adjusted in accordance with an agreed published index. Some contracts contain an annual price review in appreciation of relevant trade union settlements.

When adjustment in accordance with a type of index, it is important to use an index that are applicable for the business area the contract are operating in, and represent the change in the actual cost for the supplier. It is often not possible to find an index that fully out covers the change of prices for the parties, and thereby the supplier has a risk in this area. This is applicable for all remuneration schemes, as they often have an agreed price either in lump sum, unit price or hour rates.

An example in use of adjustment in case of inflation or deflation:

The rates agreed in the contract (appendix B, table A) and are fixed until 31.12.2009. Afterwards the rates are to be adjusted 01.01 every year, first time 01.01.2010 in accordance to the following formula:

$$P1 = P0 \times (L1 / L0)$$

Where P1 = Price after regulation

P0 = the contracts rate for 2009

L1 = the index for payment published by Statistics Norway, Industry oil and gas extraction for 3rd quarter ahead of the Year the adjustment is countable for.

L0 = same index that L1, but for 3rd quarter 2009

It is not always that the whole price is adjusted, but only 80 % in example.

A fully out coverage for adjustment of prices related to factor inputs, are not common in contracts, and thereby the supplier bears a risk in this area.

It is also a problem related to the competitive tender process if the contractual agreed price had been adjusted many times, on diffuse basis. A contract can not cover all, but have to have guidance in how to act when problem of matter arise, this should also apply for change in the price with relation to the market prices. The supplier should take in consider variation in prices when a bid is placed.

Statistic Norway publishes many different indexes and is wide used for adjustment in contracts in Norway.

5. Examination of the projects BP M&M- UGU and Tampen M&M

In this chapter to projects with different clients and there use of the target budget model are presented. In the BP M&M contract it is the Modification assignment on Ula, and in the Statoil M&M contract is for the Tampen area in general. Aker Solutions operating system is presented with there project execution model and the estimation process.

5.1 Short introduction to the projects

5.1.1 Ula

Ula is a BP owned installation located south west in the North Sea in the Norwegian side. Ula started the production in 1986 and is currently producing from 7 wells, and are alternating injecting water and gas in 4 additional injection wells. The daily production is approximately 10 000 oil equivalent. The installation consists of tree platform units, one production unit, one



drilling unit and one living quarter unit.

5.1.1.2 Ula gas upgrade

BP decided to upgrade the gas unit because the capacity for gas treatment was fully used as a consequence of the connection with the Blane field.

Figure 5.1: The Ula installation

UGU will double the gas- handling capacity to 120 MMcf/d (million standard cubic feet pr day). Aker Offshore Partner was rewarded the contract in 2005 as a part of the maintenance

and modification frame agreement. Aker already had done some work on Ula with the upgrade and connection to the Blane field.

The UGU project has a total budget of 615 mill NOK, with 1 335 tons weight handled and 397 400 man hours. The project was sanctioned January 2006.

Key figures for UGU:

Grand total cost	615	MNOK
Grand Total Weight Module	1.020	tons
Handled Weight	1.335	tons
Management	47.400	hours
Engineering	120.000	hours
Onshore Construction	161.000	hours
Offshore Construction	69.000	hours

5.1.2 Tampen M&M

The maintenance and modification (M&M) contract between Aker Offshore Partner and Statoil (now StatoilHydro), that was signed in March 2002, have gradual involved all installation in the area Tampen in the northern part of the North Sea. Statfjord and Gullfaks was in from the start, Snorre came in July 2003 and the Visund-licence in May 2005.

The contract leads to Aker Offshore Partner deliver about 2 million work hours in maintenance, modification and inspection at Tampen yearly. For AOP it is between 1100 and 1200 persons engaged in the contract. One third of the contract is inspection and two third is EPCI work.

The contract has a yearly value of approximately 1 billion NOK, excluded procurement that is arranged in StatoilHydro's own SAP. The contract in one of the most important in AOP portfolio and contribute to almost a quarter of the turnover in AOP.

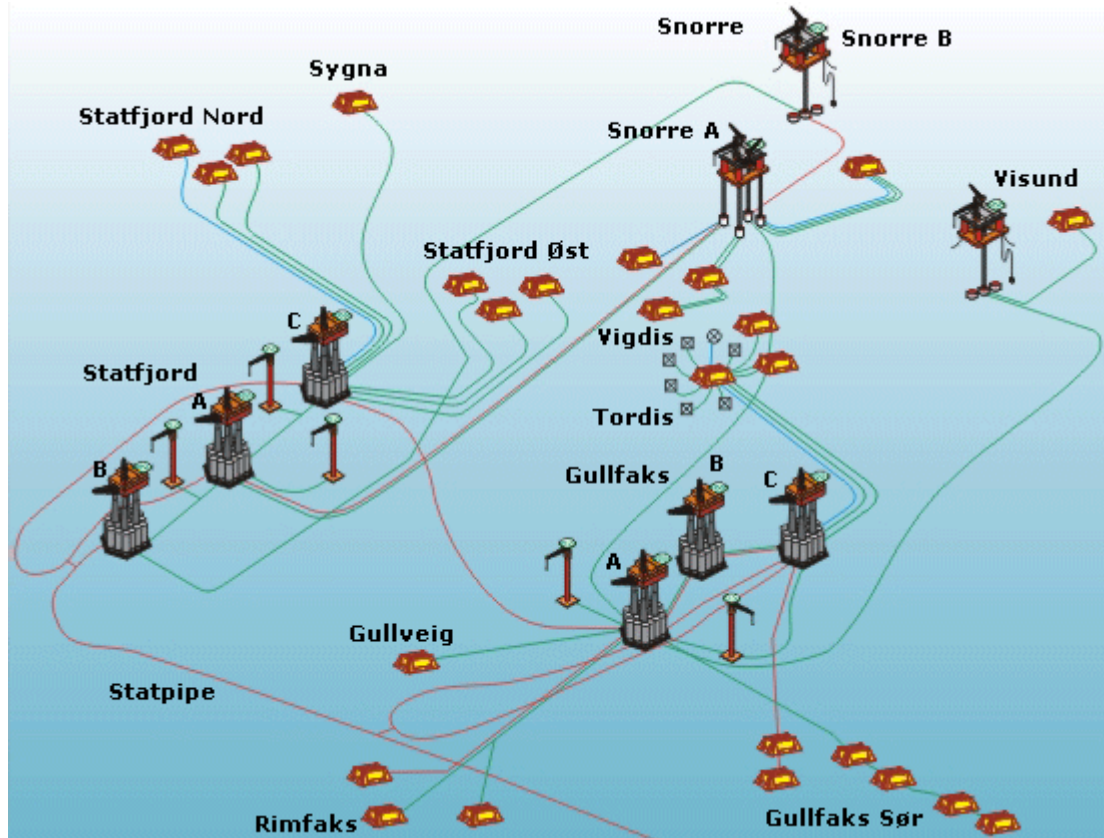


Figure 5.2: The Tampen area

5.1.2.1 Statfjord

Statfjord was discovered in 1974 and the field has been developed with the Statfjord A, B and C production platforms, which all have concrete gravity base structures incorporating storage cells. Statfjord A began production on 24 November 1979, Statfjord B followed on 5 November 1982, and Statfjord C on 26 June 1985.

Statfjord is one of the oldest producing fields on the Norwegian continental shelf, and the largest oil discovery in the North Sea. When drilling and well work are done on the field, about 200 people are employed on Statfjord A, 200 on the B platform and 240 on Statfjord C.

5.1.2.2 Gullfaks

Gullfaks has been developed with three large concrete production platforms. The Gullfaks A platform began production on 22 December 1986, with Gullfaks B following on 29 February 1988 and the C platform on 4 November 1989. Since June 1994, Gullfaks C has received

and processed oil from the Tordis field. The A platform is used for storing and exporting stabilised crude from the Vigdis and Visund

5.1.2.3 Snorre

The Snorre development embraces two platforms, A and B. The Snorre A field has been producing oil and gas since August 1992, and the Snorre B platform came on stream in June 2001. Snorre A is an integrated production, drilling and quarters unit and Snorre B is a semi-submersible production, drilling and quarters unit is a floater and lies about seven kilometres north of the A platform

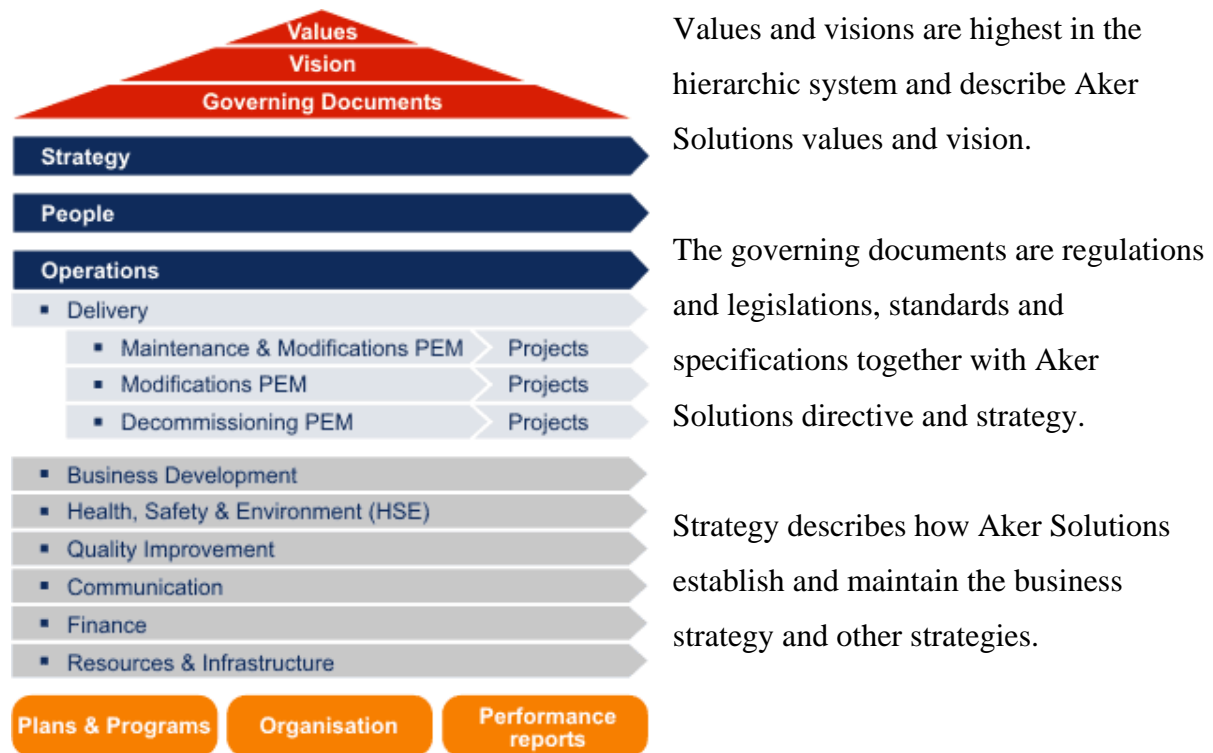
5.1.2.4 Vidsund

Visund is an oil and gas field located 22 kilometres north-east of the Gullfaks field in the Tampen area. The Visund field began producing oil in the spring of 1999, and later in October 2005 also gas. Visund North is a separate subsea development about 10 kilometres from the platform.

5.2 Project Execution Model (PEM)

5.2.1 Aker Solutions operating system

Aker uses an operating system figure which is built up in a hierarchic model with PEM is a part of. The figure below illustrates the operating system. The operating system functions are as the following:



Values and visions are highest in the hierarchic system and describe Aker Solutions values and vision.

The governing documents are regulations and legislations, standards and specifications together with Aker Solutions directive and strategy.

Strategy describes how Aker Solutions establish and maintain the business strategy and other strategies.

Figure 5.3: Aker Solutions operating system

People describe how Aker Solutions work to obtain the goals in the people policy.

Operations describe the how processes are carried out and the underlying support functions.

Delivery process, Project Execution Model, describes how Aker Solutions goes through with and control the projects from identifying a possible delivery until fulfillment of any guaranteed obligation and after sale activity. Work processes that are triggered from identification of a potential delivery are included in the process.

Business development describes the activities performed to continuously improve Aker Solutions relationship to the costumers, and also the development of products and services, technology included.

Health, safety and environment describe the work processes to ensure the implementation of an HSE mindset and reach defined HSE goals.

Quality improvement describes the work process that Aker Solutions uses to:

- Maintain the Operating System.
- Measure the effect of the work process i.e. KPI's, audits, and verifications.
- Measure the systems effectiveness and accomplish improvements of the units operation.

Communication describes the work processes aimed to ensure controlled communication internally in the unit, to media and other stakeholders.

Finance describes the working process to ensure the unit's financial goals and financial control.

Resources and Infrastructure describes the work processes to establish and maintain the unit's infrastructure which are part of their permanent assets, and the optimum utilisation of these and people resources.

5.2.2 Project execution model

PEM is the project execution model used in Aker Solutions. The project execution model consists of different phases related to the scope of work. The structure of the PEM varies with the scope of work. In the projects examined in this thesis the PEM models related to scope of work varies from modification tasks, maintenance to M&M frame agreement work.

Instead of describing the three PEM models separate, I have chosen to describe the modification PEM model used for projects, as many of these phases also are in the PEM models for the examined projects.

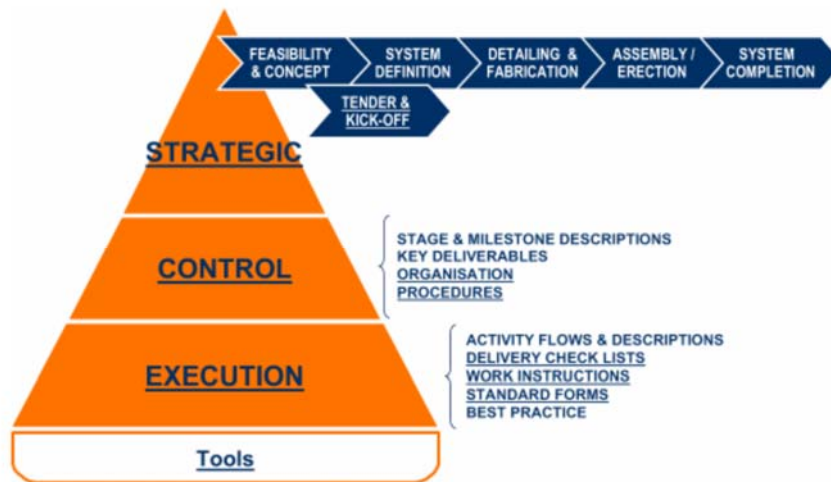


Figure 5.4: PEM Modifications

The PEM is used as a guidance through the different steps in the execution of the project.



Figure 5.5: Strategic level

5.2.2.1 Phase 1 Feasibility & Concept

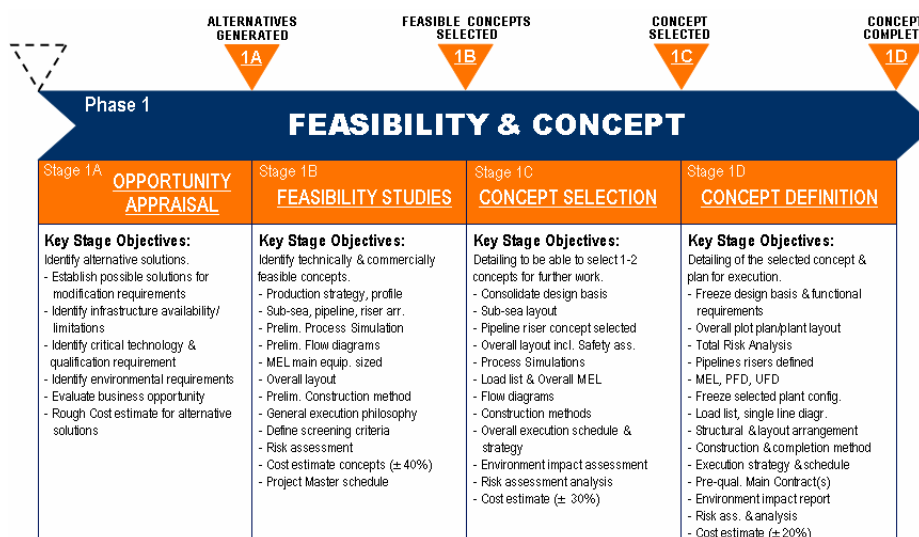


Figure 5.6: Phase 1 Feasibility & Concept

The main objective of the feasibility and concept phase is to develop the best possible business case and winning solution for the client. The phase is also named the value-engineering phase. The concept to be used is selected in this phase and thereby the project CAPEX and OPEX levels are defined. The following stages with related milestones are part of phase one:

- 1A Opportunity appraisal
- 1B Feasibility studies
- 1C Concept selection
- 1D Concept definition

5.2.2.2 Phase 2 System definition

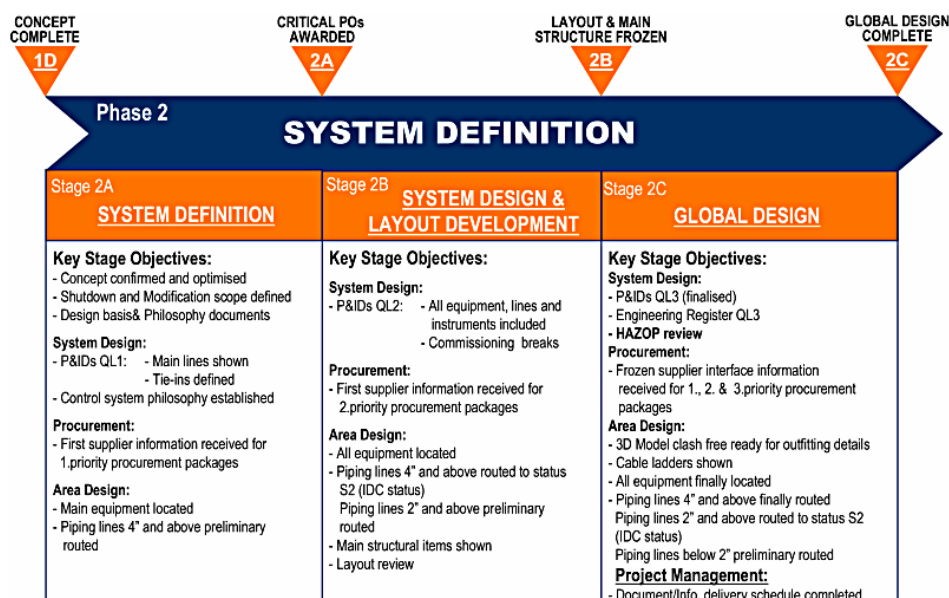


Figure 5.7: Phase 2 System definition

The main objective of the system definition phase is to detail the concept and freeze system design, implement supplier information and complete the area design to a level where the interfaces between the systems and various areas are frozen. The following stages with related milestones are part of phase two:

- 2A System definition
- 2B System design and layout development
- 2C Global design

5.2.2.3 Phase 3 Detailing & Fabrication



Figure 5.8: Phase 3 Detailing & Fabrication

The main objective of the detailing and fabrication phase is to complete detail design, prepare fabrication documentation, and fabricate the module to mechanical completion status.

Perform onshore commissioning and make the module ready for sail-away. The following stages with related milestones are part of phase three:

- 3A Detail design
- 3B Work preparation
- 3C Pre fabrication
- 3D Fabrication

5.2.2.4 Phase 4 Assembly/Erection

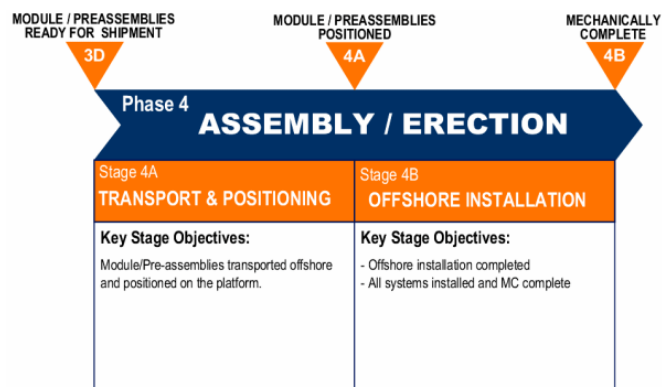


Figure 5.9: Phase 4 Assembly/Erection

The main objective of the assembly/erection phase is to transport and offshore install the module and all components and pre-assemblies in accordance with the installation method.

The following stages with related milestones are part of phase four:

- **4A** Transport and positioning
- **4B** Offshore installation

5.2.2.5 Phase 5 System completion

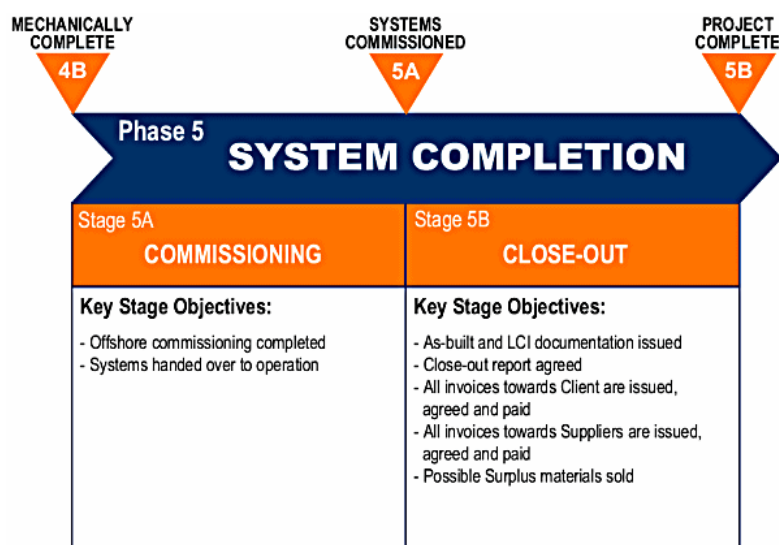


Figure 5.10: Phase 5 System completion

The main objective of the system completion phase is to commission the installed or modified system in a safe manner, in accordance with pre-defined commissioning plans and procedures. Perform the handover to operation and close-out the project. The following stages with related milestones are part of phase five:

- **5A** Commissioning
- **5B** Close-out

5.3 Estimation in M&M projects

Estimation in project is a cost identifying process. In this process the cost of the products and related processes are identified. These figures are usually used for the budget in the project, and can also be used in the target budget (without profit).

AOP does estimation in different phases in M&M projects:

- Front end studies, at feasibility studies 40 % uncertainty
- Estimation for tenders, at concept definition 20 % uncertainty
- Estimation in projects

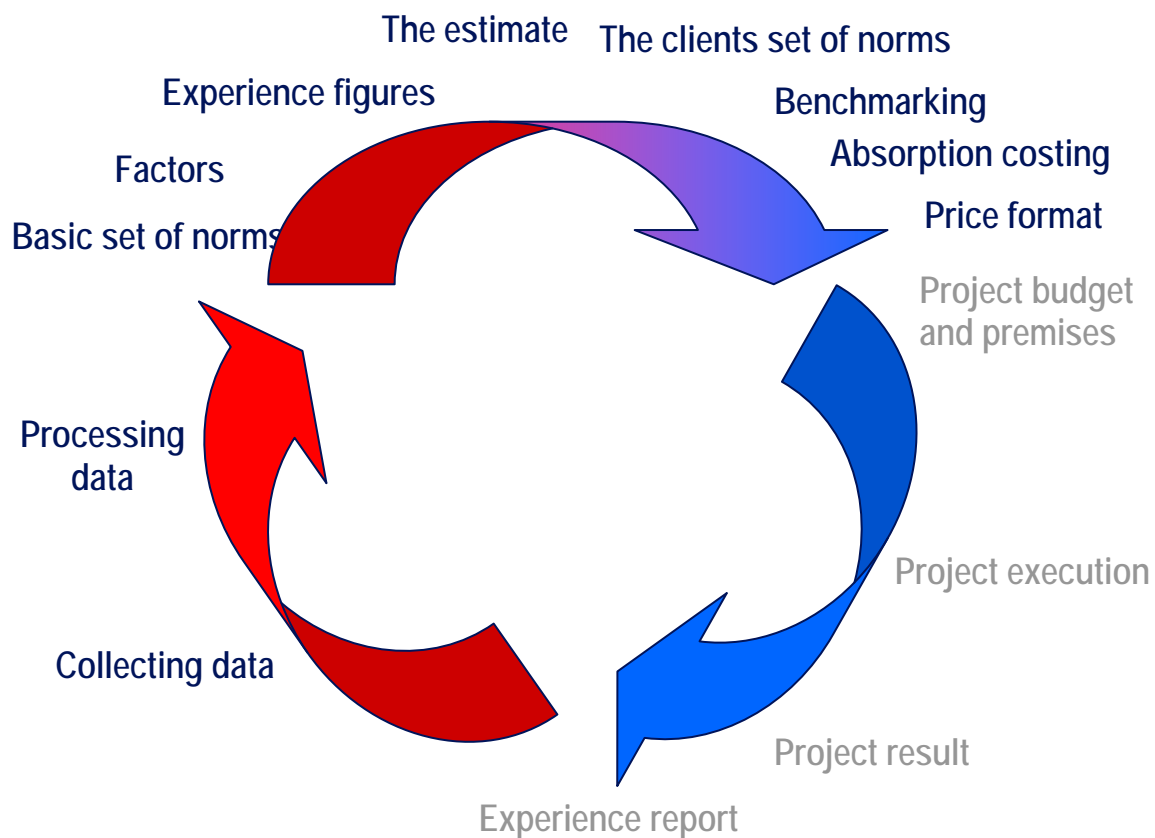


Figure 5.11: The estimation loop describes the dynamic process of estimation in AOP.

AOP uses estimation models for front end studies, weight based estimation and quantity based estimation. In general we distinguish between two different estimation methods, synthetic and analytic. These estimation methods are used in different phases in the project.

Synthetic, top-down

- Relation estimating, how one estimate relates to another adjusted for:
 - Capacity
 - Time
 - Place
 - Size
- Factor estimating, determine how an estimate varies related to one “fixed” item, i.e. total cost based on equipment cost.
- **Analytic, bottom-up**
 - Break down estimating
 - Splits estimate in details (work packs) and estimates them separately, down to unit or ton level

5.3.1 Practical approach with estimation in projects

The estimation uses updated and experience based figures for estimating the work to be done. The estimate aim at customising the project with correction factors adjusted for the environment and uniqueness of the project. The most important correction factors to consider in the estimate are: the project complexity, the technological development, factors about the location and place of the project. Based on this estimates is established and include typical elements like:

- Direct work
 - Prefabrication
 - Assembly
 - Installation and demolition (integration, hook-up, site work)
- Indirect work
- Non productive time (lost time)
- Engineering
- Management
- Procurement
- 3rd party services
- Allowance
- Contingency

When these elements are calculated, the estimated cost is identified and can be used as a budget. This is an example of elements that can identify the total cost, but the contract decides which of the elements that shall be calculated, and how the cost shall be accounted.

5.4 The use of target budget in BP M&M and Tampen M&M

5.4.1 The use of Target budget in BP M&M

This chapter is based on the actual contract in the terms of target budget. The contract is a modification and maintenance support contract for BP's oil installations Valhall, Hod, Ula and Tambar.

Target budget is used in the contract with BP in the UGU project. The intention is that this compensation model shall be the main model for modification work under the contract.

From the contract it says the following:

“The price format shall be an incitement to reduce the cost of the work and contribute to company (BP) and contractor (Aker Offshore Partner) having the same objective in the execution of the work under a given order. The price format incorporates an incentive concept whereby reduced cost for company means greater profit for the contractor. Similarly, the contractor's profit is reduced in the event of increased cost for the company”

This theory is common known and has the easy incentive principle like “carrot and stick”. The contractor will be awarded if a better result than the budget, or punished with a financial loss if a worse result.

Included as the basis for the remuneration consist the following components:

- Compensation for hour accrued based on net cost and any variable and/or fixed price components.
- A variable profit/loss component depending on final cost measured against the target budget.
- The contractor's accrued hourly costs are invoiced periodically in accordance with agreed invoicing routines.

When the work under a given order is completed, savings/overruns in relation to the target Budget will be calculated by contractor and company.

Breakdown of the price format

The breakdown of the price format is formulated in compliance with the company's requirements. The structure of the price format will form the basis for reporting of the work under a given order.

The price format is structured with a view to achieving, consistency between the cost, hours and quantities involved in the execution of the work under a given order an the target budget.

Main phases and activities are designed to harmonise with modification work of all types. Structuring is consistent with Norsok Standard Z-014 Standard Cost Coding System.

Basis for target budget

The personnel related costs, in connection with the work under a given order are defined as the target budget excluding profit.

Company cost and contingency shall be excluded from the target budget model.

The contractor is compensated through net cost rates for accrued hours in relevant categories.

At the completion of an order, it will be clear whether the contractor is entitled to further remuneration in the form of profit as a result of the price format's incentive adjustment.

The final target budget is calculated on the basis of the following:

- Weights/quantities calculated on the basis of the final design documentation (“as built”) from prefabrication and installation.
- The contract norms
- Average invoiced net cost rates within each project phase.

Determination of profit

When the work under a given order is completed, the target budget shall be updated based on actual quantities. This revised budget is defined as the final target budget.

Contractors profit shall be calculated on the basis of the final target budget for the work, and shall contain a variable profit component that varies with cost savings or overruns relative to the estimated target budget.

The following principle, illustrated by means of a linear graph, shall apply to adjustment of profit:

- Contractor’s profit with zero over/underrun of the target budget amounts to 3,5% of the final target budget for the assignment.
- Contractor’s profit reaches its maximum positive level, which is -4%, at 15% overrun of final target budget.
- Contractor’s profit reaches its maximum positive level, which is 13,5%, at 20% underrun of final target budget.
- A straight line is drawn between the points defined above as shown in the figure bellow.
- The line shall express a risk profile of 50/50 distribution of under/overruns of final cost in relation to the final target budget.
- The form of the linear graph shall be continuous. The slope of the linear graph shall not be adjusted in the contract

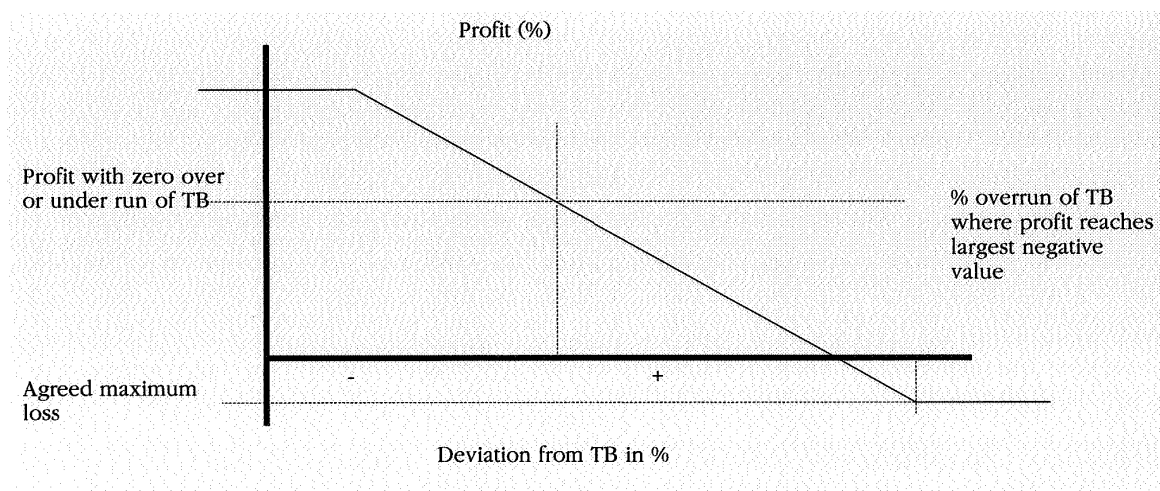


Figure 5.12: Initiated target budget model in BP M&M

The original contracts dated 1st of April 2005, and the signing is 12th of May 2005, but later on as the project is executed a new amendment regarding the target budget is sign. The amendment number 2, is dated 12th of December 2006 and signed 24th of January 2007.

In general the contract has the same concepts and regulations on the target budget, but some of the percentages in the determination of the profit have been changed.

Now these following principles shall apply to adjustment of profit:

- Contractor's profit with zero over/underrun of the target budget amounts to 6,5% of the final target budget for the assignment.
- Contractor's profit reaches its maximum positive level, which is -1%, at 15% overrun of final target budget for the assignment.
- Contractor's profit reaches its maximum positive level, which is 16,5%, at 20% underrun of final target budget for the assignment.

In general this increases the profit for Aker in any case, and is more profitable in under run or zero. The new condition also reduces the downside if overrun.

You can ask if it almost take away the “stick”, and at the same time putting a bigger “carrot” in front. These new contract conditions were settled as a part of the market situation with higher activity in the industry.

5.4.1.1 An analyse of the Target Budget Model and practical experience in the project

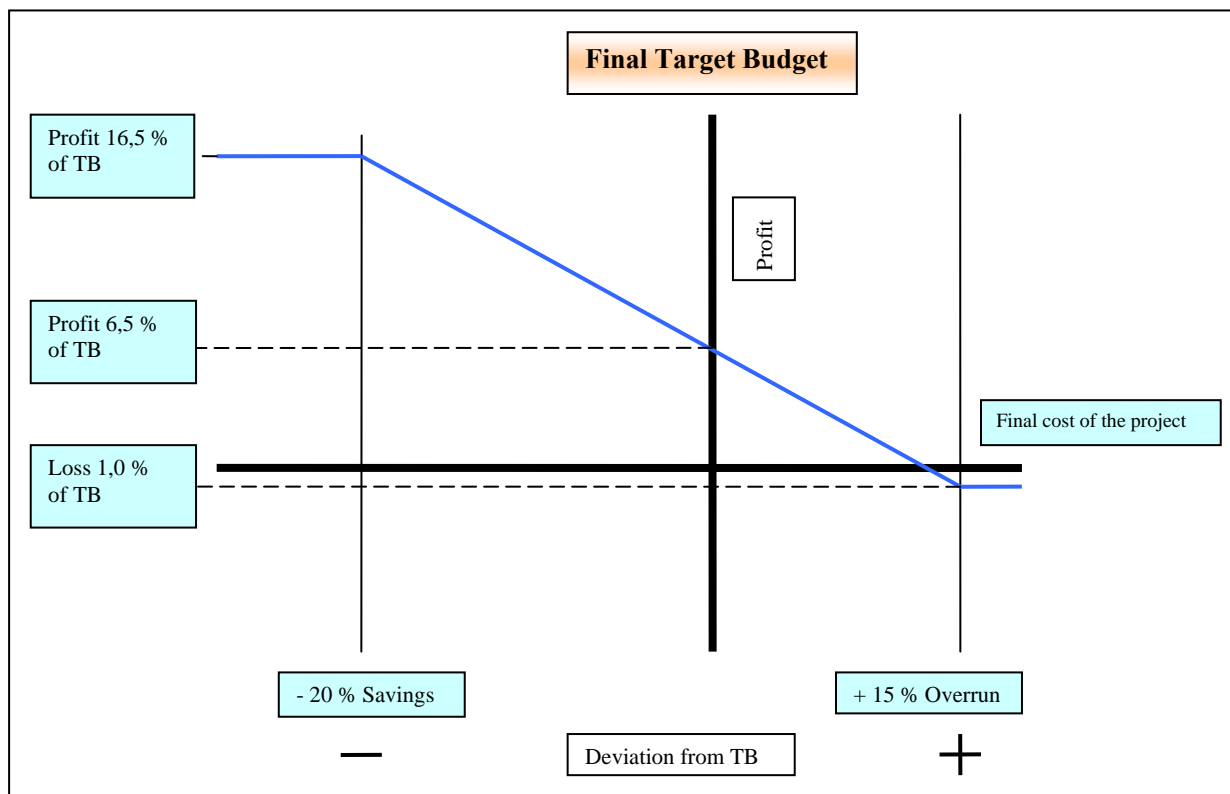


Figure 5.13: The target budget model in BP M&M

The current target budget model initiated in the contract will be like the over going figure.

The down side is low in the work, much because of the blooming time fore the industry when the contract was renegotiated.

To establish the estimated target budget Aker uses estimated quantities and experience based system for calculating the ETB. The cost of this is based on experience with adjustments, and will not be applicable for every single project, but level out in the long run.

This estimated target budget and the estimate in general have been an ongoing discussion with the client. The client have done some sampling and compared with the ETB, and did not agree about the related cost. This has result in conflicts in determination of the target budget, and has lead to very little use of target budget as a remuneration scheme in this contract.

The commercial personnel in the project point out the agreed settlement according to the contract for the target budget, but there still is a conflict and thereby remuneration is mostly done as a reimbursable basis.

As a natural of the estimate the figures are not exactly, but based on historical figures, adjusted to the specifications in the project. The figures shall not include profit. If you do a spot check the figures might not be completely realistic with the actual cost, but this is the nature of an estimate. In the long run this shall reflect the costs in the project. Since AOP are paid based on the final design, and the rates related to these products, the problem is not of extensive matters.

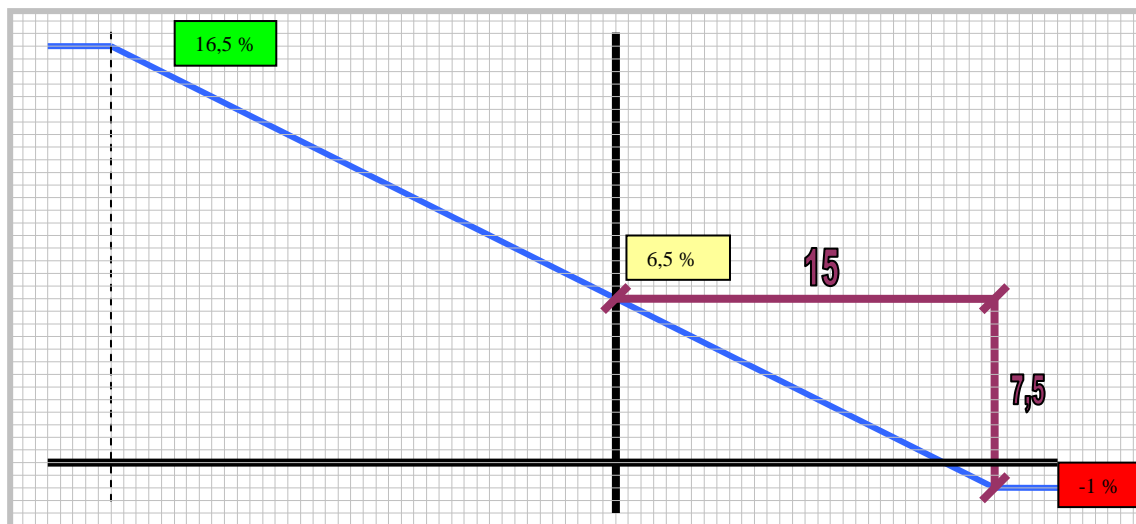


Figure 5.14: The mathematical principle in the target budget model in BP M&M

This model shows the mathematical principle of the target budget model and the 50/50 distribution of under or overruns. A overrun of 15 % gives a 7,5 % lower profit then agreed profit when zero over- or underrun.

For the graph to be linear the profit or loss distribution have to be in relation and at the graph. The figures in maximum profit and loss are a direct output of the determined profit in case of zero under/overrun. The cap in maximal profit and loss is often established in the negotiation situation.

If given the profit 6,5 % in case of zero under/overrun, the figures in maximum profit and loss will be:

$$\text{Underrun 20 \% : } 6,5 \% + (20 \% \times 0,5) = 16,5 \%$$

$$\text{Overrun 15 \% : } 6,5 \% \div (15 \% \times 0,5) = - 1 \%$$

When the cap is reached for underrun (20 %) AOP can still make more profit in the scope of work, but the performance profit is limited to 16,5 % of the final target budget.

If for example in a project the final target budget is 100 million NOK.

If the actual cost is 50 million NOK, AOP's profit will be 16,5 million. In percentages of 50 millions 16,5 millions is:

$$16,5 / 50 = 0,33 = 33 \%$$

This means that Aker in general can have profit over 16,5 % of the real cost in the project, but newer more then 16,5 % of the final target budget.

5.4.2 Target budget in Tampen Maintenance and Modification contract

The maintenance and modification contract between Aker Offshore Partner and Statoil (now StatoilHydro), that was signed in March 2002, and with the redeemable option the contract go on to at least February 2011.

The contract is one of the most important in AOP portfolio and contribute to almost a quarter of the turnover in AOP.

StatoilHydro's intention in having all licence under the same contract is to save money trough the Supplier and Owner developing a common practice in M&M.

The contract in it self is a 25 pages document, based in the Norwegian Total Contract 05/92. In addition to the contract it is 11 attachments, from A to L, and a range of amendments to the contract.

The actual title of the contract is Contract 4600004730 “Kontrakt for vedlikehold og modifikasjoner”, translated to Contract for maintenance and modifications. The contract is original in Norwegian, so the content is translated.

5.4.2.1 The contracts reference to Target budget

In Attachment B the remuneration is described:

Target budget

Intention

Company's (StatoilHydro) intention is that this compensation model shall be the main model for modification work under the contract.

The model may be applicable for a combined portfolio defined as the order. It shall be clear from the order what modification and improvement that take part in the order. It will however also be of interest to use the remuneration model for single standing modification work.

Target budget general principles

The price format shall be an incitement to reduce the cost of the work and contribute to company and contractor having the same objective in the execution of the work. The price format incorporates an incentive concept whereby reduced cost for company means greater profit for the contractor. Similarly, the contractor's profit is reduced in the event of increased cost for the company.

Included as the basis for the remuneration consist the following components:

Compensation for hour accrued based on net cost and any variable and/or fixed price components.

A variable profit/loss component depending on final cost measured against the target budget.

The contractor's accrued hourly costs are invoiced periodically in accordance with agreed invoicing routines.

When the work under a given order is completed, savings/overruns in relation to the target Budget will be calculated by contractor and company according to agreed profit/loss graph, ref figure 5.15

Breakdown of the price format

The breakdown of the price format is formulated in compliance with the company's requirements. The structure of the price format will form the basis for reporting of the work under a given order.

The price format is structured with a view to achieving, consistency between the cost, hours and quantities involved in the execution of the work under a given order and the target budget.

Main phases and activities are designed to harmonise with modification work of all types. Structuring is consistent with Standard Cost Coding System with a few adjustments to harmonise better with the general conditions related to execution of the modification work.

Basis for target budget

Generally

The working related costs, hours and rent of equipment under a given order, are defined as the target budget excluding profit.

Company will in every single case determine if the offshore extra fee will take part in the target budget model.

The contractor is compensated through net cost rates for accrued hours in relevant categories and rental of equipment in accordance with the supplier's rates for equipment rental.

At the completion of an order, it will be clear whether the contractor is entitled to further remuneration in the form of profit as a result of the price format's incentive adjustment.

The final target budget is calculated on the basis of the following:

- Weights/quantities calculated on the basis of the final design documentation (“as built”) from prefabrication and installation
- The contracts offered norms
- Average invoiced net cost rates within each project phase
- Estimated cost of equipment rental

Summary of used hours and costs

Column 1 Estimated hours reflects final estimated hours for every single item with on the basis of the “as built” weights/quantities and the contract norms included offered factors

Column 2 Net cost rates average for every single item. In calculation of final target budget shall average net cost rate be calculated based on actual invoiced hours within every item

Column 3 Target budget reflects work related costs and is a expression of cost where the supplier have a large degree of influence

The following form is not to be filled out, but made as an orientation of the structure of the target budget and the total cost of the project.

Table 5.A: A structure orientation of the target budget model

SAB	COR	Cost element	Estimated hours	Net Cost rates aver.	Target budget
		Column	1	2	3
2	C	2.1 Ini. Items – fixed-price elements			
2	C	2.1 Ini. Items – variable-price elements, equipment rental			
4	C	3 Project management			
2	K	4 Design			
41	L	5 Fabrication onshore			
44	L/M	6 Installation offshore			
447	L/M	7 System test out			
53	X	9.1.5 Offshore extra fee		160	
		Total Hours / target budget			
4	C	Profit			
		Material cost			
31	E	8.1 Procurement equipment			
32	B	8.2 Procurement bulk			
		StatoilHydro mng. and logistics			
		Deduction offshore extra fee		160	
		Estimated project total costs			

 = Not to be filled out , SAB = Standard Activity Breakdown

COR = Code Of Resource

Determination of profit

When the work under a given order is completed, the target budget shall be updated based on actual quantities. This revised budget is defined as the final target budget.

Contractors profit shall be calculated on the basis of the final target budget for the work, and shall contain a variable profit component that varies with cost savings or overruns relative to the estimated target budget.

The following principle, illustrated by means of a linear graph, shall apply to adjustment of profit:

- a. Contractor's profit with zero over/underrun of the target budget amounts to 3,5% of the final target budget for the assignment.
- b. Contractor's profit reaches its maximum positive level, which is -4%, at 15% overrun of final target budget.
- c. Contractor's profit reaches its maximum positive level, which is 13,5%, at 20% underrun of final target budget.
- d. A straight line is drawn between the points defined above as shown in the figure below. The line shall express a risk profile of 50/50 distribution of under/overruns of final cost in relation to the final target budget.

The form of the linear graph shall be continuous. The slope of the linear graph shall not be adjusted in the contract.

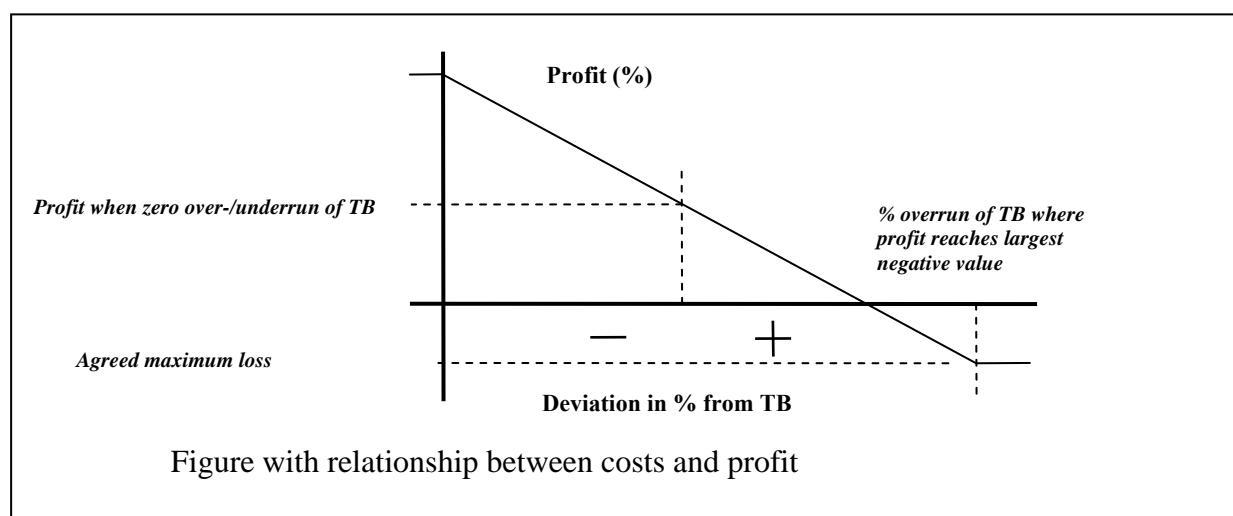


Figure 5.15: Initiated target budget model in Tampen M&M

5.4.2.2 An analyse of the Target Budget Model and practical experience in the project

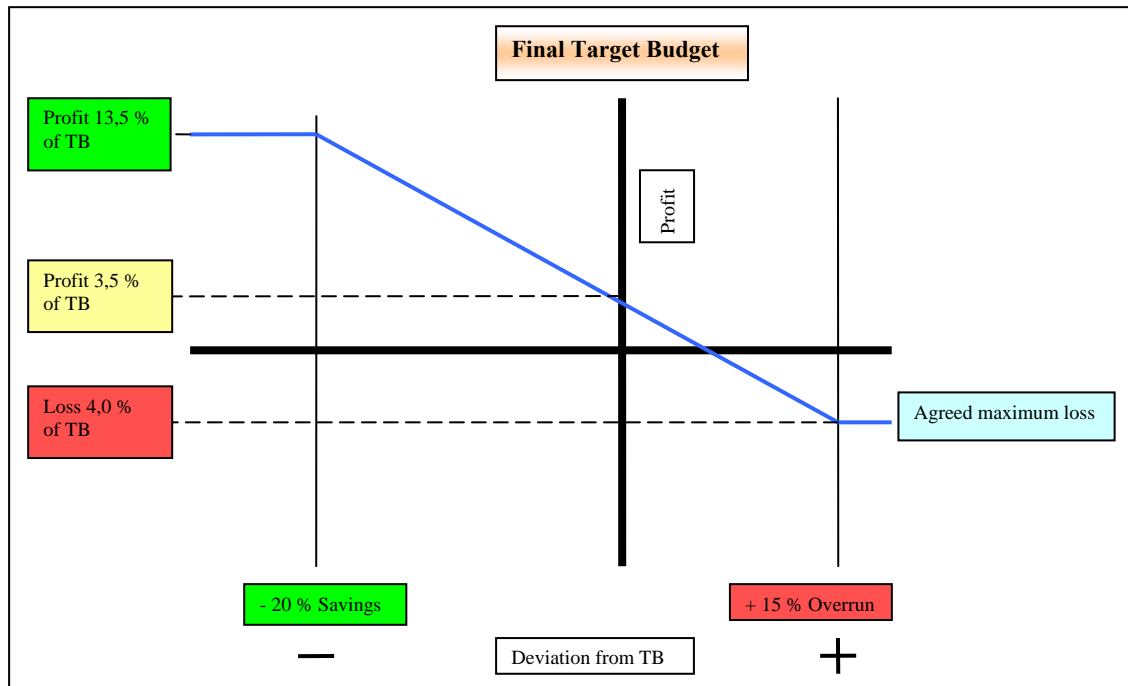


Figure 5.16: The target budget model in Tampen M&M

The target budget model initiated in the contract will be like the figure 5.16. The 50/50 distribution is an underlying principle for the model and determines the graph in the figure, based on the profit when zero under- or overrun the profit/loss in the cap is automatically set.

The 3,5 % profit was established in a negotiation process with the client. The times for the oil and gas industry in 2001 was not very profitable and a profit of 3,5 % was agreed as a result of the situation.

Later on Aker have tried to renegotiate the contract and the profit rate in the target budget model as a strong development in the salary and expenditures in the oil and gas industry, but without success. The contract was awarded in a tender process and strict rules are set to encourage a competitive marked. Thereby Aker have to stick with there profit, but the rates in personnel wage and equipment are regulated in an indexation process, but only 80 %. For personnel wage the Statistic Norway wage index in category industry wage is used. And in rental equipment the consumer price index is used.

StatoilHydro have on there side justified the refusal of meeting the claims of higher rates with the fairness of a tender process, there responsibility to keep the cost in the industry low and help the Norwegian supplier industry be competitive in the world market.

Still the extreme evolve of cost in the oil industry was not taken in consideration when calculating the bid, and thereby the contract is not very profitable for AOP, but still it develop employees and knowledge within the company.

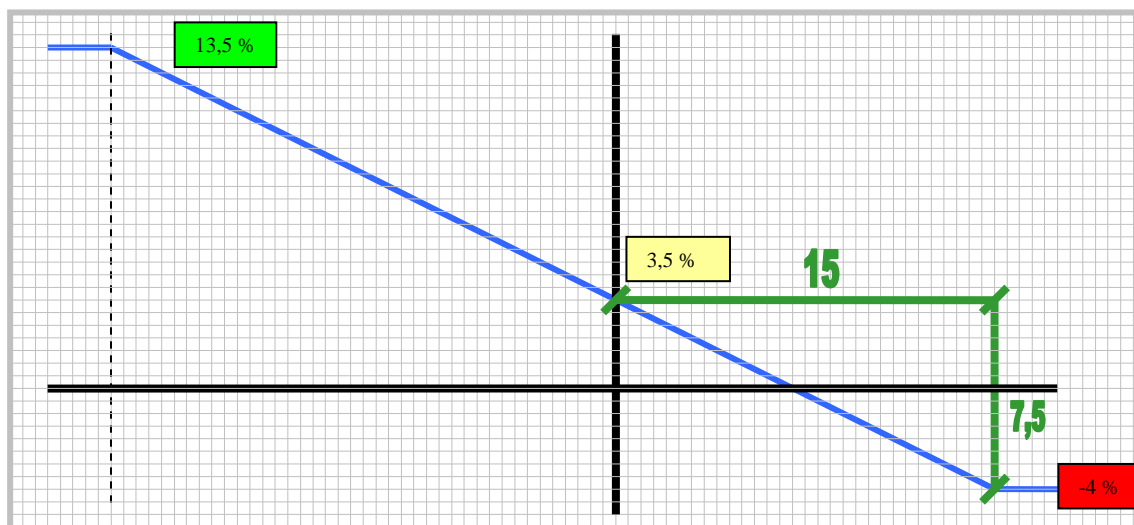


Figure 5.17: The mathematical principle in the target budget model in Tampen M&M

The mathematical principle of the target budget model is as the figure above. The function is automatically set as the profit is determined. (For further info, see section 5.4.1.1)

If given the profit 3,5 % in case of zero under/overrun, the figures in maximum profit and loss will be:

$$\text{Underrun } 20 \% : \quad 3,5 \% + (20 \% \times 0,5) = 13,5 \%$$

$$\text{Overrun } 15 \% : \quad 3,5 \% \div (15 \% \times 0,5) = - 4 \%$$

The model underneath is a practical example from the project. The example has estimated weight; steel 500 ton and piping 300 ton. The rate is also slightly adjusted in the final target budget as an outcome of the indexation.

Table 5.B: Target budget settlement in Tampen M&M

Target budget settlement Tampen						
Preliminary target budget						
Discipline	Weight	Norm	Hours	Rate	Cost excl. profit	
Steel	500	130	65 000	475	30 875 000	
Piping	300	180	54 000	470	25 380 000	
Design steel 38%			24 700	510	12 597 000	
Design piping 60%			32 400	520	16 848 000	
Management 12,9%			22 717	525	11 926 372	
Rate = Estimated full cost			198 817	491	97 626 372	
Final target budget						
Discipline	Weight	Norm	Hours	Rate	Cost excl. profit	
Steel	505	130	65 650	480	31 512 000	
Piping	305	180	54 900	476	26 147 058	
Design steel 38%			24 947	515	12 847 705	
Design piping 60%			32 940	525	17 293 500	
Management 12,9%			23 018	530	12 199 738	
Rate = Actual full cost			201 455	496	100 000 000	
Performance	Hours	Rate	Cost excl. profit	TB profit	Perform- ance profit	Total profit
I. Invoiced 80% of TB	161 164	496	80 000 000	3 500 000	10 000 000	13 500 000
II. Invoiced 85% of TB	171 237	496	85 000 000	3 500 000	7 500 000	11 000 000
III. Invoiced 90% of TB	181 310	496	90 000 000	3 500 000	5 000 000	8 500 000
IV. Invoiced 85% of TB	191 383	496	95 000 000	3 500 000	2 500 000	6 000 000
V. Invoiced 100% of TB	201 455	496	100 000 000	3 500 000	-	3 500 000
VI. Invoiced 105% of TB	211 528	496	105 000 000	3 500 000	-2 500 000	1 000 000
VII. Invoiced 110% of TB	221 601	496	110 000 000	3 500 000	-5 000 000	-1 500 000
VIII. Invoiced 115% of TB	231 674	496	115 000 000	3 500 000	-7 500 000	-4 000 000

5.4.3 The use of target budget over and under the profit-deviation cap

The result of the project can be over and under the estimated sum of the project. The majority of the work has so far been within the agreed boundaries of the target budget model. Still some work has been over or under the agreed cap.

The figure show work within the Tampen M&M project that have a result that are over and under the profit-deviation cap.

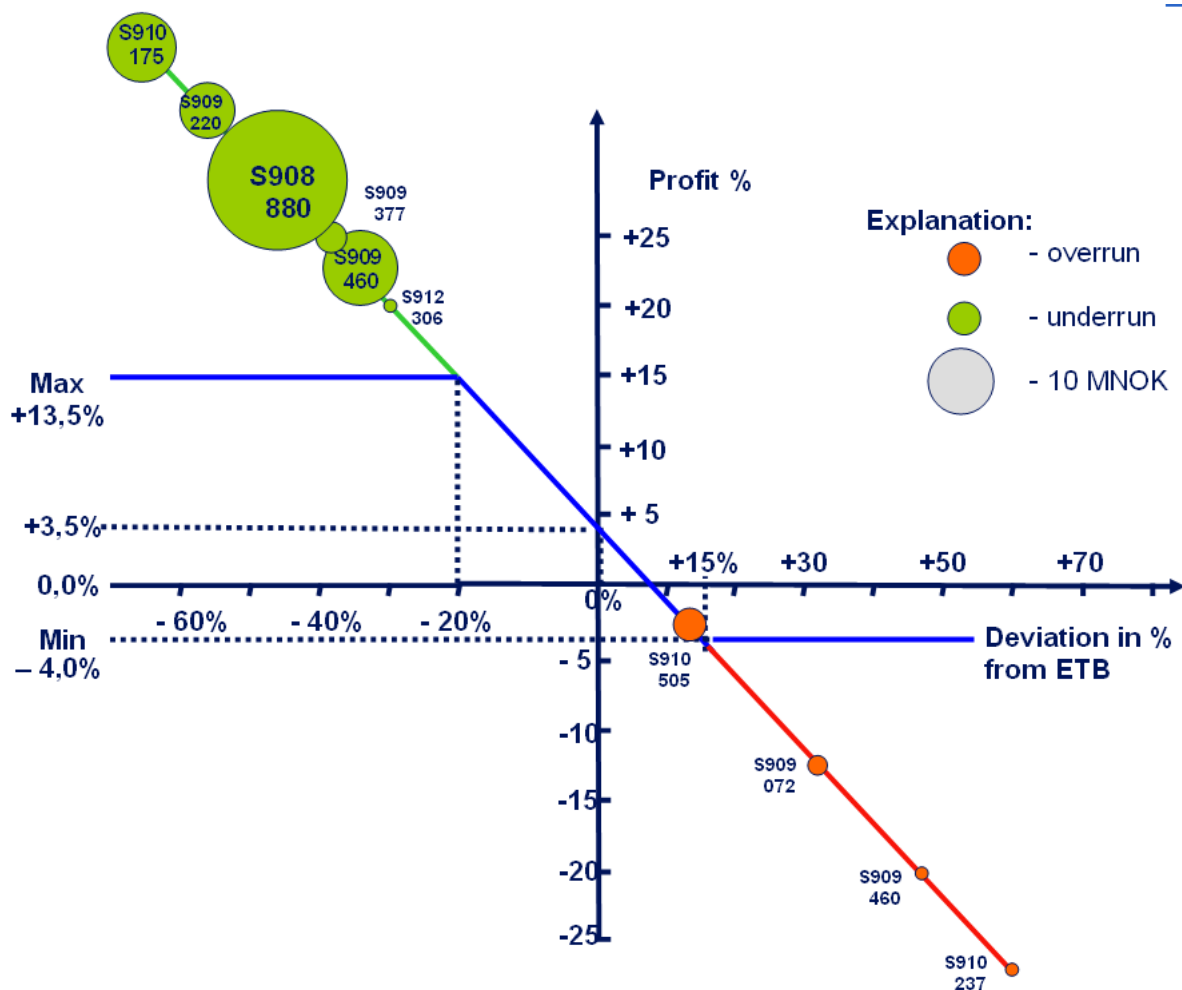


Figure 5.18: Profit-deviation cap Tampen M&M

When the cap is reached the supplier can not have more profit or loss based on the final target budget. In case of underrun over the cap he still can have more profit on the actual work, but not more then 13,5 % of final target budget.

The following is an example of a project with underrun over the cap.

Example in use

Final target budget	100 000 000 NOK
Actual cost (excl profit)	50 000 000 NOK
Difference FTB – actual cost	50 %

TB profit	3 500 000 NOK
Performance profit	10 000 000 NOK

The total profit 13,5% of FTB 13 500 000 NOK

Actual invoiced included profit	63 500 000 NOK
Actual invoiced profit	13 500 000 NOK

Profit percent of actual cost/ work $13\,500\,000 / 50\,000\,000 = 0,27 = 27 \%$

Maximum profit is reached at 80 % invoiced of final target budget, and the owner does not pay more then this, still the supplier can gain more profit on the actual costs. This example statutes that the profit can be over 13,5 % of the laid down work, but newer more then 13,5 % of the final target budget.

This extra profit can be achieved as a result of faster and better work then estimated. The actual work is then done at a lower price then the contractual rates. In a fixed price contract this is a stronger incentive then in target budget remuneration since the supplier keeps all the savings. In theory the supplier can shift his resources to a more profitable project went ha cap is reached.

The result can also be an overrun of the target budget, and the supplier has to take a share off the loss. The cap in this contract is 4 % off the final target budget. After this cap is reached the incentives goes away for AOP as the supplier.

5.4.4 StatoilHydro as the client

StatoilHydro is dominant as an oil company on the Norwegian Continental Shelf and Aker Offshore Partners largest client. Aker and StatoilHydro have worked closely together since the discovery of oil in the North Sea. In this way the two companies know each other well and

know what are expected to gain success. Unfortunately it is not easy to keep this transfer of experience in every project since there often is new people, new regulation and new technology in projects, but consensus is the same.

AOP have done work for StatoilHydro compensated based on target budget model in many projects, and the guidance and practical experience with the model is gained. This can be some of the reasons for the model function so well at the Tampen M&M projects.

5.5 Frame agreements with subcontractors

In the same way Aker Solutions are in frame agreement contracts with there clients, they also have frame agreements with there subcontractors. This to reduce the administrative cost secures a stabile delivery with agreed quality and competitive prices.

Sometimes in projects Aker also use the clients frame agreements, but just when the client want to or require this.

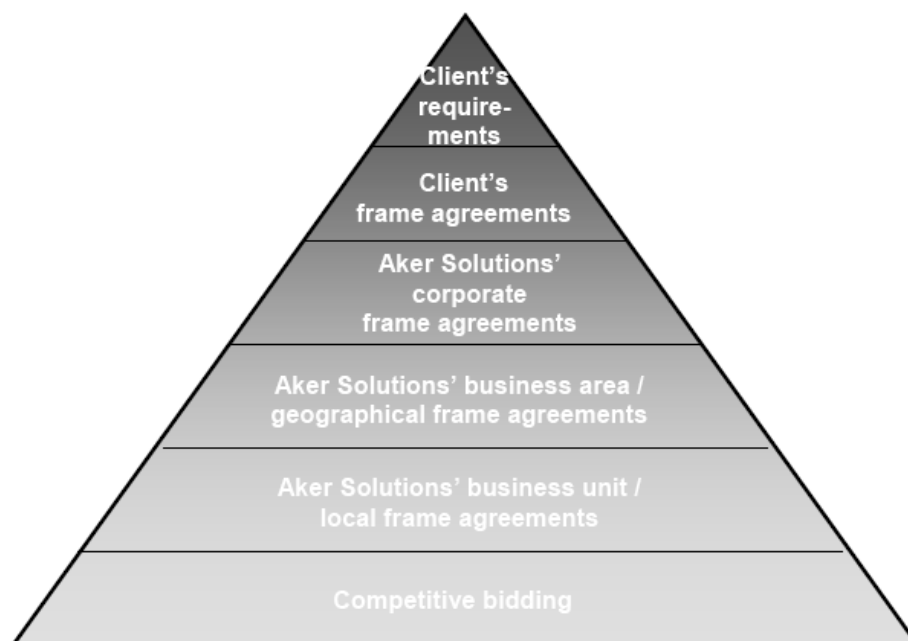


Figure 5.19: Frame agreements, added value in order of priority

In Aker Solutions frame agreements the focus is in general on:

- General terms and conditions
- Prices
- Availability / Lead times
- Quality of supply chain

Example of frame agreements within the Aker solutions system is the frame agreement for steel products with the Norwegian steel delivery company, Norsk Stål AS.

The contract with Norsk Stål gives Aker discounts in accordance with the product- catalogue. The agreement is negotiated for the Aker system to ensure good prices and availability of materials. The price agreed in the frame agreements are percentage-discounts at products to the product-catalogue. The different products have different discounts, but a rough average of 30 % discount. The price Aker pays is regulated by Norsk Stål and there cost elements. There catalogue price varies with the price of steel and are often changed in accordance with the steel price.

A problem Aker can face as a large supplier in the oil and gas industry is the many subcontractors they have in projects. In there contracted and ongoing projects can the failure of one subcontractor make Aker lose lot of money, even more then the contracted sum with the failing subcontractor.

Example:

- Main contract value 100 MNOK
- Liquidated damage (LD) for delay in max is 10 % of the contract sum, which equals to 10 MNOK
- Identical LD's transfer; max 10 %
- Subcontract value 20 MNOK
- Liquidated damage for delay is max. 10 %, equals to 2 MNOK
- This is not back-to back, and means great loss because of a subcontractor.

In order to have back-to-back conditions, the subcontractors maximal LD should be 50 % of the contract sum, which equals to 10 MNOK. No subcontractor with a common sense will

enter into this type of contract. Thereby Aker bear a quite large risk in these contracts, with critical delivery from subcontractors.

The frame agreements do not need to be on exclusive supply basis, and could be bases on the competitive bidding anyway. Frame agreement work as a one way commitment for the supplier and it is common practise for the owner to have several frame agreements within one market sector with multiple suppliers. The supplier that offers the best bid, win the tender.

6. Discussion

In this chapter the target budget model is discussed, both in relation to practical experience from the projects, the mathematical concepts of the model, the handling of variations, establishing of cap and the basic concept of the model. The spot price remuneration scheme is discussed and some practical examples are illustrated, with link to reliable indexes.

6.1 Discussion Target budget

The target budget model as remuneration scheme is frequent used much because both the parties, the supplier and the owner, can easily see the mutual benefits related to the common goal, and the incentive to pull in the same direction. The main function is to have the same objective in the execution of the work

However under what conditions the target sum is set is not that easy to clearly give an answer to. What is behind the figures and how the parts came up with this exact figures is often established in a tender process with negotiations.

When talking about TB, we often operate with three different dimensions of numbers/figures. We have:

- **Estimated TB:** the estimate of the work based on historical numbers and future forecast of the work often established by the supplier, much like a budget.
- **Final TB:** the model that determinate the profit for the supplier based on final design, actual as built quantities and installed elements, often in consistence with the contracts norms and rates. The difference in FTB from ETB can be small or big variation in the scope, new technology to be implemented or other unforeseen events.
- **Actual occurred costs:** the real cost that have been on the project, equipment, personnel and materials all the way in the executing parts organisation.

The profit is calculated from the difference between Final TB and actual invoiced costs.

6.1.1 The structure of a Target budget

The steps in a target budget (TB) in the Tampen M&M contract:

- Establish estimated TB before start of work under a given order, in most cases the TB is established in the study phase of the project, before bidding
- Get paid for accrued hours, full cost/ without profit, during the process
- The difference between Final Target Budget and actual accrued hours determinates the profit

6.1.2 The mathematical formula for profit within agreed cap

Within the agreed cap the profit/loss in a final target budget settlement can be explained with a mathematical formula. Determination of profit within agreed cap:

$$Y = (TB-AC) / 2 + TB * X$$

Explanations of the formula:

Y = profit in NOK

X = agreed profit in % when zero over- or underrun of Target budget

TB = Target budget

AC = Actual Cost

6.1.3 Example of the structure of a target budget in piping:

It is common to start the work by estimating the given order. An example of this is from estimating a work with a one ton pipe.

Direct work:

Example fabrication and installation of 1 ton pipe 5" CS:

Man hours for fabrication and installation is calculated from handled quantities and contractual norms

Fabrication hours = norm x quantities	155 hours
Installation = norm x quantities	104 hours
System testing	5 hours
Total Direct hours (pipe)	<u>264 hours</u>

Management and design:

Direct hours create basis for calculation of hours for management and projecting:

Design, pipe (60 % x 264) =	158 hours
Design, multi discipline (29 % x 158) =	46 hours
Management* (12,9 % x 468) =	60 hours
Total mgr. & proj.	<u>264 hours</u>

Total target budget (ETB) 528 hours**

* Hours for task managers, cost, planning, estimation, document control, supply chain and installation coordinators onshore

** Factors for indirect hours, working foremen, fire guard, non destructive testing,

The purpose of the target budget is that Aker together with the client shall save money by being more efficient and share the profit.

6.1.4 Why the estimated target budget (ETB) is important:

- The ETB give control information under the execution of the project
- Gives AOP a opportunity to achieve better profit
- Gives AOP a field for training regarding the estimating of fixed-price projects
- Inputs for a ETB contributes to improvement of AOP prognosticated cost by improving procurement estimate and prognosticated profit
- A ETB in the study phase act as a check point where AOP can evaluate job stated and installed quantity up against estimated quantities in the study phase

6.1.5 Variations and handling of variations

When talking about variations you distinguish between two types, the total variation of contract and variations within the frame of existing contract. It is the last variation that is discussed further on in this chapter.

Compensation of variations in relations to target budget:

- Weight related variations are compensated by the company trough revise of the TB, possibly with new quantities. The result becomes a final target budget with upward adjusted quantities when the project is finished. All variations in weight shall be reported in the variation system where the value increases.
- Non-weight variations are compensated by the company trough that the value of the variation is deducted from incurred cost in the final settlement.
- Internal variations as a result of adjustments in the plan can affect the productivity factor and thereby the result of the target budget. Example a high use of man-hours because of correction of errors

Non-weight variations: Variations that can not be compensated trough the contractual norms, examples re-design.

6.1.5.1 The use of non-weight variations

If the non-weight variations aren't calculated in the figures and then adjusted, the result will be wrong and give a lower profit, example:

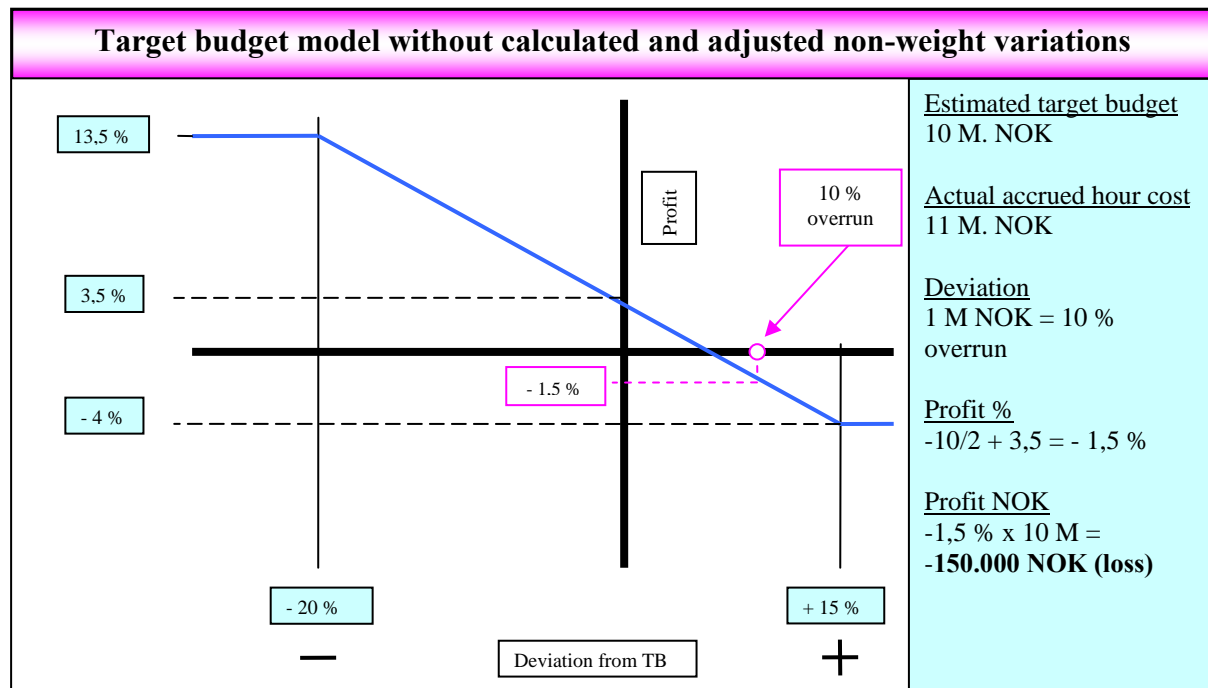


Figure 6.1: TB model without calculated and adjusted non-weight variations

This figure explains the result of the project when the non-weight variations are not calculated in the target budget. This will lead to a different outcome of the project, hereby represented with a loss of 150.000 NOK as a result of the project.

It is important to take in consideration the variations when calculating the profit in the target budget, and not just in the payment for the actual change in work as a result of the variation. To emphasise this I will also present the model with the calculated and adjusted figures for non weight variations, and compare the two models.

Same example, but the non-weight variations are calculated and adjusted as part of the figures:

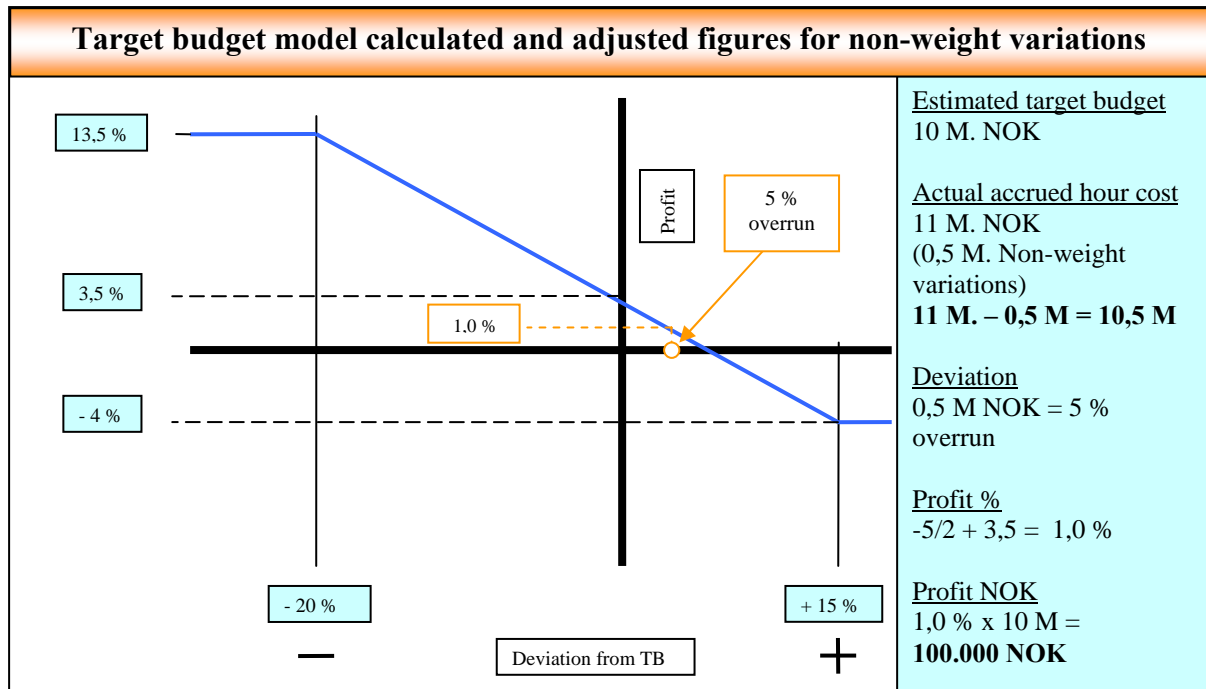


Figure 6.2: TB model calculated and adjusted for non-weight variations

The two models show a result of respectively 150.000 NOK losses and 100.000 NOK profit. This lead to a variance of 250.000 NOK, or 2,5 % of the total target budget. This is just an example, but emphasis the importance of right handling of variations, also in commercial relations.

6.1.5.2 The use of weight related variations

Weight related variations are easier to handle, as they are compensated by the company through revise of the target budget with new quantities. The weights that are handled and the products that are purchased have already costs and will be compensated as regular work. The compensation will be like the ordinary target budget, but with a new higher figure for the target budget.

6.1.5.3 Variations in general

This chapter shows that variances are no problems in target budgets when handled right. The supplier gets paid for the variation work, and gets an incentive based profit related to this work equal to all other work under the target budget. The problem can be the commercial understanding of variation work and way to act when variations emerge.

6.1.6 Establishing cap

A contract is often awarded in a competition with a tender process. There is no universal way of setting the cap in the tender process. The cap is often set in a negotiation process, sometimes the owner/contract awarder have given guidelines to the cap. The guidelines can be initiated maximum and minimum levels, and for the supplier to state his opinion.

AOP have strategies that are used in tender process, and elements to consider in the phase of establishing cap are part of this. The outcome of a negotiation process is often a reflection of division of power. The supplier can lower his demands if his market situation is not locking so good, or higher his demand if his other alternatives to the contract is better. In this way AOP have different cap in their contract portfolio.

Basic elements for AOP to consider in establishing of the cap:

- How much of the work is to be done under the TB model?
- How much flexibility is to be shown?
- What is the profit in a reimbursable remuneration scheme?
- The target budget model does not include bonuses.
- Norms is just estimated, and have risk.

This elements and assumptions is what make AOP's strategy for establishing the cap in a target budget model. The cap in case of overrun is a contributor to risk in the project for the supplier. If the cap is established with a small down side at negative level, the price of the risk is lower then with a large negative cap.

6.1.7 The use of cap in the target budget model

The cap in a target budget can be looked to as a compromise agreement between the owner and the supplier as a part of the give and take in the 50/50 distribution off profit/loss, and to make this an agreeable model for both parts in the contract.

One way of seeing it can be: The supplier have saved the owner for 70 million NOK, but only got 31,5 M.NOK. But the “savings” can be an error in the estimated rates and norms, or the supplier miscalculated on purpose.

A high cap can give the supplier incentives to estimate wrong numbers, to get an abnormal high profit. The model needs to have a cap since the numbers are set in different stages of the target budget model. (Section 6.1)

The most logical would be to have better profit when he fully out does what he has estimated to do, then when his work varies from the plan. This is a weakness in the target budget model. The incentives are set for the supplier to work better and faster, but this is not always so easy to plan.

6.1.8 The Target budget and basic fundamentals in the concept

The concept about the target budget where the supplier have incentives to save money for the owner, and get rewarded, when executing the project is what make the model popular in use. Question can be asked in the practical use of the remuneration scheme, when the supplier is rewarded more when he miss on doing the work according to the estimate, then if he does exactly what he estimated and planed to do.

The contractual rates are often based on experience and adjusted to the contracted scope of work. In the target budget model this contractual rates shall be without profit. The rates are often structured as a weighted average based on experience. Sometimes the rates are all-including with administration, equipments, offices etc. In this way it is difficult to determine if the rates include profit or not. This can easily lead to a discussion, but the supplier is paid according to the final target budget and the contractual rates her, so what the estimate don't matter more then its contribution to the cash flow under the execution of the project.

The owner often has to raise money for the project. In the Norwegian oil and gas industry the installations are run by one operator, example StatoilHydro, but there are several other companies that hold the right for the field. The operator needs to raise money and can use the estimate to present the financial needs. As earlier mentioned the oil companies invest based on the cash flow, and the process of raising money is demanding. If the estimate is too high, the supplier and the operator, owner, can lose credibility among the other oil companies.

6.1.9 Anecdote, the use of target budget model in Google's advertising campaigns

The target budget model is also used by Google in their commercial advertising business. The supplier (Google) gets paid by their clients (the advertising company) in accordance with the target budget model.

The estimated target budget is set as a price and marketing strategy from Google. Higher expected clicks give a higher price and more attention on Google's internet site. The 50/50 distribution of under or overrun, is linked to the click rate on the commercial.

The cap is a maximum bonus for Google in case of extra clicks (underrun) or a discount for the client if fewer clicks (overrun). The final target budget is the actual number of clicks.

Google then have incentives to achieve a higher click rate for the advertising company's commercial, and if they achieve this they are paid more.

6.2 Discussion Spot price

6.2.1 The use of spot price remuneration scheme

The intention with the use of spot-price is to implement a contractual price that reflects the correct market price at every time.

Spot-price is a common expression for most people, perhaps most known from the electric power industry, where the storage and consumption reflects the price on electricity. Just like this is also the price on raw materials for the industry. The price of materials fluctuates as a function of the supply of materials from the producers and the demand in the market.

The oil supplier industry have their costs related to raw materials and factor inputs, often machinery, equipment, raw materials and labour. The cost of labour is an important factor in the total cost picture, but I have chosen not to discuss this further in this thesis.

The oil companies have their incomes from sale of produced hydrocarbons and sold services to others in the business. The price of oil fluctuates as a function of the supplier storages and the demand in the market, both real time and expected. The expenses for the oil companies are to the government, other oil companies and suppliers in the industry.

The supplier industry get their share of the high oil price in terms of more assignments and higher volume in the business. This does not directly mean a greater profit since more new people need to be hired and trained up, and can lead to lower productivity. New investments in machinery and equipment take time and money to incorporate. On the other side the oil companies get very favourable conditions in terms of higher income of their sold products.

The fact that the prices are pushed up as a function of a higher demand is well known theory. In this way the supplier can be better paid when new contracts are awarded. The supplier can have a portfolio of sub-suppliers who are demanding higher prices for their goods or services.

This general cost picture make the supplier come in a squeeze and price there risk after these situations. The use of spot-price remuneration scheme can lower the risk premium and with that the overall cost. Of course it can reflect badly in terms of a price raise in raw materials, but the risk is here shared between the two parties in the contract, and weighting of the risk depends on the parties' ability to bear the risk. The remuneration scheme with spot price is launched to distribute the burden with the change in price of input factors. It gives a joint approach for some of the factors that are beyond both parties control. It make a more right approach in the way the costs in the project evolve, and witch of the two parties that have pay for this.

If the cost of input factors goes down, the supplier will pay less for his materials, he will get less paid, and the final cost for the owner will go down. Same if the cost of input factors goes up, the supplier have to pay more for materials, but get paid more from the owner. To explain more about this I have chosen to describe more about the process that leads to the change in price.

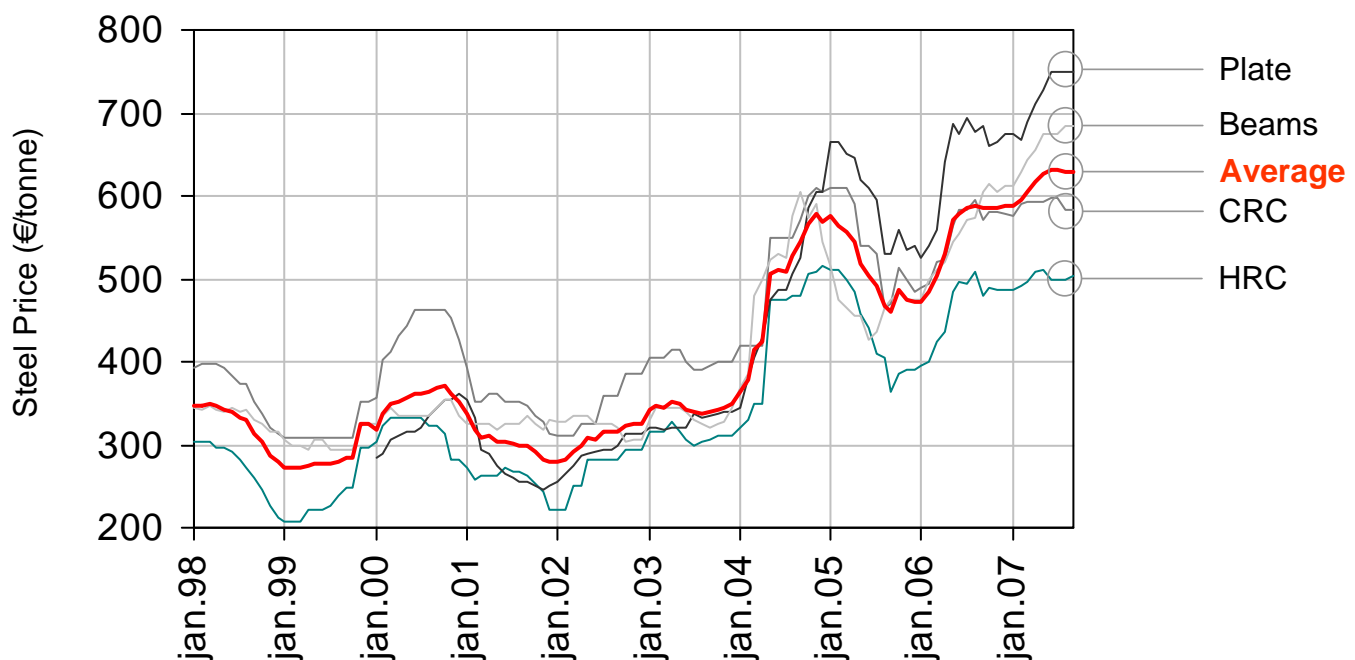


Figure 6.3: Historical steel price on plates, beams, CRC, HRC and avarage

Source: Steel Business Briefing. Northern European prices.

The historical steel price on plates, Beams, CRC (Cold Reduced Coil), HRC (Hot Rolled Coil), and average

6.2.2 The change in price, theoretical approach

According to Van Weele, basically the price paid for materials and services is the result of environmental factors, both internal and external. Internal factors can be logistic, technical treatment or of organizational character. External factors are those factors that change the availability of a product in a given market and can be divided in to economical, socio-political, or technological development.

Changes in price can be described as the following: If the change in cost factors is identified by the symbol $f(c)$, and the change in market factors by the symbol $f(m)$, with f as a weighting factor, then the formula is:

$$\sum (f(c) + f(m)) = 100 \% \text{ of the price}$$

According to this formula, a change in the price paid is to be considered as the sum of the changes in the cost factors and/or changes in the market factors. Changes in cost factors can stem from:

$f(c1)$: change in labour costs

$f(c2)$: change in materials costs

$f(c3)$: change in energy costs

$f(c4)$: labour productivity

$f(cn)$: etc.

Changes in the market structure can stem from:

$f(m1)$: change in demand

$f(m2)$: change in supply

$f(m3)$: change in supply side inventory

$f(m4)$: change in supply side capacity utilization

$f(mn)$: etc.

6.2.3 Spot price on raw materials as a remuneration scheme

The supplier share the price volatile and thereby a part of his risk in the project with the owner. This method shall in the long run make the overall price of the work go down since the supplier has a lower risk premium. Still in a single agreement contract the owner has less incentives then the supplier to engage in a spot-price regulated contract then in a fixed-price contract.

This compensation scheme is especially relevant in uncertain times, both in upwards and downwards economic trend. The latest “boom” in the industry leads to an enormous increment in the price of raw materials. This had a bad economical influence for the suppliers who had engaged in large fixed-price projects and the red numbers was big. The consequence of this is higher prices for the owner in future project, to cover the losses. The ongoing financial crisis has lead to fewer initiated projects, and prices in general are decreasing.

In contracts and project that have a long time perspective, an escalation clause like spot price remuneration can be a good thing. This is to make the profit for the supplier more predictable, and make him focus on doing the work at an excellent quality in an efficient way.

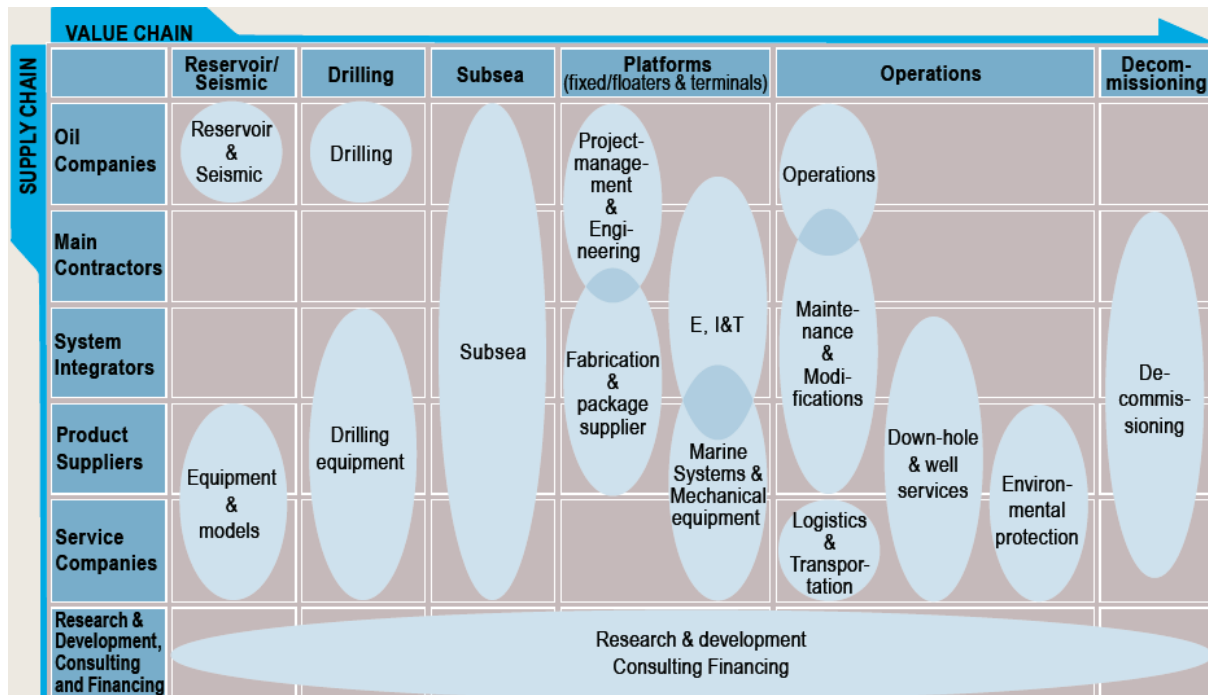


Figure 6.4: Interactive map of the Norwegian Oil & Gas “World-Class” Cluster

(Source: Facts 2008)

For the owner the price of raw materials often has a correlation with the price of sold goods, in this case the oil. The direct outcome of this is the increased income as a function of higher price of produced goods, but also increased expenditures on factor inputs, like raw materials

On the Norwegian continental shelf there are many suppliers that do work for oil companies. Figure 6.4 gives an expression in what types of services that are provided. In this business it is primarily within subsea, platforms and operations (M&M) that the spot price remuneration will be highly relevant.

6.2.3.1 Practical approach in spot price on raw materials as remuneration scheme

For the remuneration scheme to be successful the two parties have to agree about some important parts that will be critical for the remuneration scheme to be successful. One of the success criteria is the regulation, it has to be linked to a credible index or market publication. There are many indexes and markets, both national and international. The two parties have to have an understanding of the structure in the index, and what components that is the foundation for the index. Statistics Norway publishes a wide number of indexes and raw material prices, and are consider as a reliable source. The figures behind these publications are often historical figures within the last month or weeks price developments and the prices paid on the market will be on the front edge of these prices.

The index or market publication that is used in the regulation has to be highly relevant to the costs of the project. If the project involves many disciplines and materials, the remuneration scheme get more complex, but still straight forward, with a percentage distribution.

The settlement has to be done often, as the indexes and raw materials vary at a day to day basis. The main idea about the remuneration scheme is to reflect the actual costs in the project so it has to be regulated often, at least every month, which is common practise for monthly settlement.

6.2.3.2 Example of use

Spot-price metals

	NOK/Ton				
	Aluminium	Copper	Nickel	Zinc	Lead
2009					
April	8 554,7	29 015,3	73 338,1	9 065,9	9 070,9
March	7 844,3	25 099,3	65 600,6	8 118,5	8 399,9
February	7 486,2	22 665,7	71 443,8	7 652,0	7 560,1
January	7 686,9	22 918,3	79 853,6	8 380,9	7 988,4
2008					
December	7 836,3	21 395,9	68 081,9	7 696,5	6 708,0
November	9 420,1	25 894,4	74 362,2	8 092,7	8 905,0
October	11 250,6	33 236,0	82 664,2	8 763,1	9 939,0

Source: London Metal Exchange (LME) and Statistics Norway (SSB)

If used on an actual paid sum by the owner is a function of an agreed percentage fixed, and an agreed percentage related to the price of input factors.

$$P_s = P_a * (0,5 + 0,5 * SP_i / SP_0)$$

P_s = The total contractual remuneration, Paid sum

P_a = The agreed sum/ rate for remuneration

SP_i = spot-price materials in period i (aluminium)

SP_0 = spot-price materials in period 0 (aluminium)

With an example of 10 millions in the month from January to February:

$$P_s = 10 \text{ million} * (0,5 + 0,5 * 7486,2 / 7686,9)$$

$$P_s = 9,869 \text{ millions}$$

6.2.4 Spot price on oil as a remuneration scheme

The oil companies get paid by selling their products, the oil. The oil price varies and makes the income of the business uncertain. If the supplier is paid as a function of the oil-price, he will bear some of the risks of the price being low for a long period, but will also share the upside of an increasing oil-price. The owner will not get the high peak income of the price rise to a high level, but are also partly secured in a low price scenario.

The oil companies have a fear of low oil prices in a long period, and will postpone new development projects. This remuneration scheme can have a benefit for the supplier industry as they bear some of the risk, and the owner will initiate projects that might not be profitable in a long time low-price scenario. This remuneration scheme will also work as a bonus for the supply companies in a high oil price scenario.

6.2.4.1 Brief about the Norwegian surtax system for oil business

The surtax from government in Norway applies for companies that produce oil and gas, and they are committed by law to pay these taxes. The remuneration scheme was presented for the Norwegian oil taxation office in May 2009, to have a taxation expert view. I will explain a little about my interpretation of these laws in relation to this remuneration scheme.

According to the Norwegian law about taxation of underwater petroleum deposits (lov 1975-06-13 nr 35: Lov om skattlegging av undersjøiske petroleumsforekomster) a company that operate in petroleum extraction, processing and pipeline transportation is to pay a surtax to the Government. According to the law and NOU 2000:18, this companies is interpret to also include services that are remunerated with a combination of price and volume is to be considered as part of production, and thereby taxable to the surtax. This lead to some disputes and the phrase was repealed in December 2004. Still companies that closely involve with each other can be judged by the government to be participants in another company, and thereby take part in their tax system. Thereby this remuneration scheme has to be carefully made and included in contract to not be a part of the surtax system. My interpretation and the response from Norwegian oil taxation office about this remuneration scheme is that it is just a regulation of the contractual sum and will thereby not a part of the surtax system, but it is

important to take in consider the existing laws in the applicable country, before enter in to this remuneration scheme.

6.2.4.2 Practical approach in spot price on oil as remuneration scheme

The oil companies have there revenue from sales of oil at the open market. Prices they will get for there product varies with the market. This remuneration scheme is launched for the supplier and owner to have a joint platform for income. Many oil companies invest on basis of the cash flow, and thereby have less to invest when the income decreases.

The supplier are often meet with or squeezed in to renegotiations with following cut in rates and payment when the price of oil going down bellow the oil companies expected price level, but are not reward when the price goes up.

If the supplier of an oil field construction or services is compensated in accordance with the actual market price on oil, will the market establish more realistic price expectations and more profitable projects will be executed. Spot price related remuneration will in practical use be insurance for both parties. The expenditure will be the supplier's reward when higher price, but can also be less in case of low price. If the supplier is rewarded lower minimum rates together with spot price contract, an extended tale phase production can be the result.

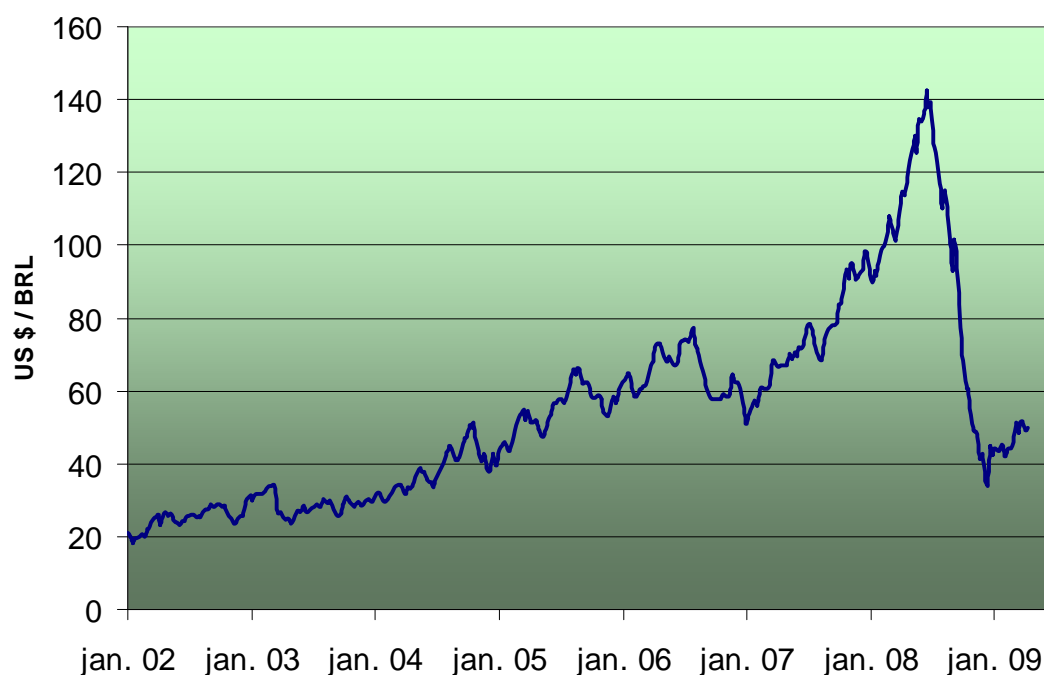


Figure 6.5: Historical oil price graph, US dollar per barrel

6.2.4.3 Example in use

Week	2002	2003	2004	2005	2006	2007	2008	2009
1	20,7	30,6	31,2	41,3	61,9	55,4	96,7	34,3
5	19,9	30,9	30,1	44	63,9	56,6	92,4	43,8
10	23,4	33,8	33,4	53	58,4	60,3	102,9	44,2
15	24,3	24,9	34	50	69,1	68,3	106,7	51,4
20	24,5	26,7	38,7	47,1	67,4	67,9	122,1	56,5
25	25,1	26,8	34,9	56,6	68,4	72,3	122,1	
30	25,8	28,2	40,3	58,5	72,2	77,4	126,3	
35	27,1	28,5	40,2	66,5	67,2	71,5	112,8	
40	28,4	29,4	47	58,9	55,9	79,1	92,3	
45	23,5	28,9	43,3	58,2	56,8	93,9	59,8	
50	29,5	30,3	38,9	58,5	59,8	90,6	41,4	
52	30,4	29,5	38,6	57,1	64,3	93,7	36,3	
Yearly avrage	25,1	28,7	38,1	53,5	64,5	72,2	74,1	-

Source: Statistic Norway (SSB) and Energy Information Administration USA (EIA)

$$P_s = P_a * (0,3 + 0,7 * SP_i / SP_0)$$

P_s = The total contractual remuneration, Paid sum

P_a = The agreed sum/ rate for remuneration

SP_i = spot-price oil in period i (week)

SP_0 = spot-price materials in period 0 (week)

With an example of 10 millions in week 52 2008 to week 15 2009:

$$P_s = 10 \text{ million} * (0,3 + 0,7 * 51,4 / 36,3)$$

$$P_s = 12,912 \text{ millions}$$

An alternative can be the use of the oil companies estimated oil price, extraction assumptions, as period 0.

6.2.5 Spot price on raw- materials and oil as a remuneration scheme

This remuneration scheme makes both parties eat a piece of each others cake. This can be beneficial in order to smooth out the peaks and valleys in the long time picture, and is especially relevant in uncertain times.

6.2.5.1 Example in use

The following example of calculation according to remuneration based on spot price on oil and raw materials use figures from examples in section 6.2.3.2 and 6.2.4.3 (full table in appendix)

$$P_s = P_a * (0,2 + 0,4 * SPM_i / SPM_0 + 0,4 * SPO_i / SPO_0)$$

P_s = The total contractual remuneration, Paid sum

P_a = The agreed sum/ rate for remuneration

SPM_i = spot-price materials period i

SPM_0 = spot-price materials period 0

SPO_i = spot-price oil in period i (week)

SPO_0 = spot-price materials in period 0 (week)

With example from December 2008 to March 2009, with aluminium as the used material

Oil price is calculated for periods in weeks, with average price in the month to be:

$$\text{December 2008} = (45,15 + 41,17 + 42,68 + 36,34) / 4 = 41,33$$

$$\text{March 2009} = (44,16 + 44,04 + 45,80 + 51,19) / 4 = 46,30$$

$$PS = 10 \text{ mill} * (0,2 + 0,4 * 7\,844,3 / 7\,836,3 + 0,4 * 46,30 / 41,33)$$

$$PS = 10,485 \text{ mill}$$

This is just a simply example, and the materials used in the project have to be reflected in the remuneration scheme. Several materials can be used to customise the remuneration to the relevant input factors in the project.

6.2.6 Spot price as an alternative remuneration scheme in AOP's contracts.

AOP have frame agreements with sub-suppliers that insure the delivery of goods and services to competitive prices in the market. An example of this is the frame agreement within deliveries of steel products. The frame agreement is between Aker Solutions ASA and Norsk stål AS (A leading steel- and metal distributor in Norway). The agreement give Aker related companies a god discount on the listed prices according to the price list. The discount varies with the different products, and has roughly a discount of thirty percent.

Frame agreements like this helps Aker Solutions get hold of the needed products at the right time to a comprehensive price. The discounts are just in percentages to the listed prices, so the listed prices vary, and a new product price is listed every month.

The prices published by Statistic Norway (SSB) indicate the price development on raw materials, and are published monthly. Even if this publication is not the exact amount AOP pays for there input factors, the price indicates the market situation, and the material expenditures in the project.

For a client the link between actual expenditures in the project to the invoiced prices is often agreed in the contract. In some of AOP's contracts they are paid fully out for there expenditures, like in reimbursable contracts, and the clients can also pay the direct cost (with a fee) on the procurement. In these contracts the spot price remuneration scheme is not a god alternative. But in fixed price contracts like new building of complex offshore structures the remuneration scheme will come to proper use.

7. Conclusion

7.1 Target budget

The target budget model is the preferred remuneration scheme in Aker Solutions presented maintenance and modification projects, probably because it gives Aker Solutions as a supplier the incentives to reduce the cost of the project. The model also contributes to the two parties having the same objectives in the execution of the project. The supplier's incentive in this remuneration scheme is to save money for the owner, and by this his profit increases.

In the examined cases the target budget model is used, but varies in the degree of use. The lack of agreement in handling of variations and estimate have lead to little use in one of the projects, while the other project execute most of the work according to the target budget model. When the contracted rates are not up to date with the cost picture in the industry to day, some of the intention with the incentives has naturally been weakened. A success criterion for the target budget model is a good consensus in the working collaboration between the parties.

The profit and related cap are often set in a negotiation process before the contract is rewarded. The outcome of this process reflects the market situation, and the distribution of power among the parties engaged in the contract. The principles with the target budget models 50/50 distribution of profit and loss automatically determine the slope of the graph, and thereby the profit/loss at the cap. But the size of the cap is determined in a negotiation process. When the cap is reached the incentive in the model goes away. The supplier can still have more profit on his actual cost in case of underrun, but never more than the agreed profit gap according to the final target budget. A large cap in case of underrun can lead to an extreme high profit for the supplier on his actual costs.

When handling projects with target budget as remuneration scheme it is important to be aware of how variations have influence on the target budget model. The figures needs to be adjusted as the model often are compensated on the as built quantities.

Weaknesses in the model are that the supplier should have more to win on exact hitting the estimated target budget, walk his talk.

7.2 Spot price

This remuneration scheme with spot prices gives the parties in a contract a joint approach for some of the factors that are beyond their control. It makes a more right approach in the way the costs in the project evolve, and which of the two parties that have to pay for this.

If the actual cost of input factors goes down, the supplier will pay less for his materials, and the final cost for the owner will go down. Same if the cost of input factors goes up, the supplier has to pay more for materials, but get paid more from the owner. In overall the price of the projects in total will go down, since the supplier charges a lower risk premium.

The remuneration scheme as suggested is for regulating the paid cost in a project. For it to be successful it has to:

- The regulating has to be linked to a credible index
- The index has to be highly relevant to the costs of the project

This model is at a certain degree quality assured for use in Norway and the Norwegian taxation system. There is large a variety in laws for taxation in the world, so it is important to look into the specific laws for the country and the business before adapting this remuneration scheme.

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Appendix

Weekly spot price oil

Uke	2002	2003	2004	2005	2006	2007	2008	2009
1	20,7	30,6	31,2	41,3	61,9	55,4	96,7	34,3
2	18,6	31,4	32,2	44,7	62,5	50,9	95,0	44,5
3	19	32,1	32	45	63,2	51,8	90,7	42,4
4	19,6	31,1	30,5	46,1	62,9	55,5	88,4	44,0
5	19,9	30,9	30,1	44	63,9	56,6	92,4	43,8
6	21,1	32,3	29,9	42,9	60,8	58,4	90,5	43,6
7	19,7	32,8	31,1	42,9	57,5	55,6	95,8	45,2
8	20,2	33,4	31,9	46,9	58,3	57,7	97,7	42,3
9	21,9	33,8	33,9	51,2	60,9	60,4	99,8	42,0
10	23,4	33,8	33,4	53	58,4	60,3	102,9	44,2
11	24,4	28,6	34,5	54,6	62,1	61	108,4	44,0
12	25	26,2	34,3	55,2	61,2	61,6	103,8	45,8
13	26,5	27,3	32,9	52,1	64,9	66,6	102,5	51,2
14	25,1	25,1	32	53,7	67,2	69,9	100,8	48,6
15	24,3	24,9	34	50	69,1	68,3	106,7	51,4
16	26,4	25,3	33	50	72,3	65,9	110,0	51,7
17	26,6	23,2	33,9	50,8	73,4	67,6	113,8	49,2
18	26,1	23,9	36,1	49,2	73,5	64,7	111,4	49,8
19	26,5	26	37,6	48,1	70	63,8	119,3	53,9
20	24,5	26,7	38,7	47,1	67,4	67,9	122,1	56,5
21	24,3	26,4	38,3	47,9	67,9	71,7	110,0	57,6
22	23,3	27,9	38,3	49,7	67,9	55,3	113,8	60,6
23	22,9	28,6	35,2	51,4	67	72,4	111,4	66,6
24	24,6	26,8	34,7	53,2	65,1	70,5	118,4	
25	25,1	26,8	34,9	56,6	68,4	72,3	122,1	
26	25,7	28,4	32,8	56,3	72,3	72,7	135,4	
27	25,2	28,2	36,2	57,9	73,7	75,3	139,2	
28	26,3	28,9	36,8	57,5	73,8	78,8	137,1	
29	25,5	28,2	38,7	57,1	73,3	79,1	134,7	
30	25,8	28,2	40,3	58,5	72,2	77,4	126,3	
31	25,5	29,9	42,4	60,9	76,6	77,4	123,6	
32	26,4	29,8	43,4	64,2	77,5	71,7	117,6	
33	27,6	29	44	65,4	71,7	71	111,2	
34	27,2	30	42,6	65,9	71,3	68,9	112,2	
35	27,1	28,5	40,2	66,5	67,2	71,5	112,8	
36	28,5	27,5	40,4	63,6	64,6	75,9	104,8	
37	28,2	26,2	41,8	61,4	60,3	78,1	97,7	
38	29,3	26,1	44,6	63,2	59,5	79,2	90,4	
39	30	28	46,8	62	58,4	79,3	101,3	
40	28,4	29,4	47	58,9	55,9	79,1	92,3	
41	28,7	31,2	50,7	58,3	57,5	79,9	81,4	
42	26,8	29,5	48,9	59	58,3	85,3	69,7	
43	25,5	28,5	51,2	58,6	57,4	83,4	64,7	
44	24,6	27,8	45,5	59,5	55,4	90,3	61,4	
45	23,5	28,9	43,3	58,2	56,8	93,9	59,8	
46	24	29,8	40,7	53,4	57,9	91,6	53,7	
47	24,4	27,9	42,9	53	55,5	94	48,2	
48	25,9	28,3	41,3	53	56,6	92,7	49,2	
49	26,8	29,6	37,9	55,1	57,9	89,5	44,1	
50	29,5	30,3	38,9	58,5	59,8	90,6	41,4	
51	31,4	29,8	41,4	56,6	63,2	91	42,1	
52	30,4	29,5	38,6	57,1	64,3	93,7	36,3	