

Engineering Consulting – The new golden era?¹

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ABSTRACT

This paper is about the growing scene of engineering consultancy around the world and all the impacts related to contracts between the client and the consultants. To compare the impact of the different contracts, I have based my paper around the organizations who are creating standardized templates for engineering and ranked them upon determined criterion.

The conclusion clears the fact that no contract is perfect and that these organizations are providing a solid source upon which you can improve it taking care of the more specific clauses of the project studied.

In the case of mechanical engineering, the contracts from FIDIC seem to be the most appropriate ones.

Key words: Liability, Disputes, Delays, Responsibility, Intellectual property, Engineering Consulting

INTRODUCTION

The engineering services market generates today \$711bn of revenue, employs 3.9 million people across more than 700 000 companies. This sector is booming regarding the new economic models of companies and their willingness to outsource. They realize that in most cases, it's more profitable to outsource to specialists than hiring them.

This multiplication of interaction between companies has raised another concerned, the number of disputes.

These disputes are usually about the outputs created by the consultants towards the companies. In fact, the issues and disputes raised are mainly because of the contract itself more than what the consultant has produced and result in cost escalation, damages, unpaid change orders, etc. The contracts are sometime written by technical people who are not experts in this field so mistakes can easily be done. The main areas of disputes are the liability,

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the delays, the responsibility and the intellectual property. To get rid of these common and recurrent mistakes, organizations like FIDIC (International Federation of consulting engineers), EJCDC (Engineers Joint Contract Documents Committee), etc. have created standardized contracts. By creating these contract, they aim to become 'best tested and proven practices' and to be used among entire industries. A lower chance of a successful claim, a fairness between the parties are the primary advantages of using these templates. As well as creating these templates, these organization are more and more involved in the creation of new standards such as ISO (International Standards Organization) thanks to the worldwide network of practitioner they constitute.

Another fact to point is the concentration of consultants into single companies. Altran is the European leading company in engineering consultancy with a turnover of €2,120bn and 29 106 employees. In the USA, we can point out Fluor with a turnover of \$19.04bn and 61 551 employees. This trend isn't going to slow down because the development of these firms overseas is done through takeover of local companies.

STEP 1: Objective Statement

In this paper, we will identify 2 sources of mechanical engineering consulting contracts and compare them to the standardized ones regarding the keywords stated at the beginning.

METHODOLOGY

STEP 2: Feasible alternatives

1. The intellectual property of the output, a major concern.
2. Dealing with the delays, who is responsible, who is liable?
3. How to deal with disputes?

STEP 3: Attributes to evaluate alternatives

For this paper, I will compare the following attributes among the criterion detailed further down.

- FIDIC: International Federation of Consulting Engineers
- EJCDC: Engineers Joint Contract Documents Committee
- AIA: American Institute for Architects
- CONSENSUS DOCS

I decided to compare these 4 sources of standardized contracts and see which one would be the most accurate from a mechanical engineering consultant point of view

STEP 3: Development of outcomes

1. The intellectual property of the output, a major concern.

The contract is owned by both the client and the consultant. However, during the tendering process, the client might negotiate around the intellectual property if the contract involves researches about any kind of new techniques, new materials, new plans. The consultancy firm might want to own the output and be able to gain on the recognition from the project output. It might want as well to be able to make some benefit from the patent which might be applied during the contract phase. To make sure this part isn't overlooked in the contracts, organization like FIDIC and EJCDC have clearly stated how to deal with this concern in the different standardized contracts.

A good example of this intellectual property issue is an example from the NASA. While developing the heat shield of the new spaceship, they delegated the task to an external laboratory. To convince them to realize the work, during the negotiation phase, they agreed to allow the company to use the patent for a commercial use. The cost has been undertaken by the NASA and the benefit went to this company who created a new revolutionary paint.

2. Dealing with the delays, who is responsible, who is liable?

Liability and responsibility in a contract are the main reasons for disputes, especially when it comes to delays. The major impact of delays is usually a cost inflation. However, this resulting cost must be assumed either by the client, either by the consultancy firm or both.

First, the cause of the delay must be agreed by both parties (if required, they can be helped with a neutral third party). Once it's agreed, they can refer to the contract and go straight to the delay section to see what has been agreed during the negotiation phase. If the contract is well written, all the procedure of dealing with a delay which is a form of dispute is detailed in the contract itself.

In the special case of a shared risk between the 2 or more parties, it must be well explained in the contract how the sharing is done.

3. Dealing with disputes

A dispute is a 'A conflict or controversy met by contrary claims or allegations on the other'. Even if the dispute is dealt informally, the good manner of doing is to keep a note of this dispute, how it has been resolved and the time and cost which might have been considered.

However, the disputes are mostly claimed for important and serious issues which automatically need a formal resolving process with formalized processes of tracking the dispute, communication, and lessons learnt. This process is clearly detailed and expressed in every standardized contract. It states the main roles and action of each parties.

Resolving a dispute is a key process element of a project and having clear processes can allow to gain time and money among the resolution. The smoother is the resolution of the dispute, smaller are the unnecessary time and effort consumed. At the end of a project, all parties want it to finish on time, with no overrunning costs to maximize the chances of a future collaboration.

Step 4: Selection of the acceptance criteria

I have chosen 7 attributes to compare the different sources of standardized contracts mechanical engineering consultant may use.

Easy to use is to provide an insight about the time to set up the contract and the requirement or not of a legal background to understand all the lines of the contract itself.

Specific to mechanical engineering is an attribute to judge whether the contract can be used by itself without modification and be applied to an engineering mechanical client-consultant medium.

Collaboration between the parties to show if both parties are well and fairly represented in the contract, to see if there is no bias between them

Intellectual Property is a major aspect of the contract for engineering consultancy in general so a crucial point to check

Resolving the Disputes Process a project without dispute isn't a real project, the absolute need of a resolution disputes process in every engineering consultancy contract.

Dealing with Delays because they can occur so how to deal with them, is there any procedure stated?

Shared Risks in case of unlikely threat to occur, better to know how to deal with the outcome and who is responsible, or liable for the risk impact.

FINDINGS

STEP 5: Analysis and comparison of the alternatives

Criterion	FIDIC	EJCDC	AIA	CONSENSUS DOCS
Easy to use	Complete template with an exhaustive list of points to look at closely and develop if needed in the project	Very complete, covered already most of the areas	Yes, all the areas are covered or at least mentioned	Very long and fully detailed, can be used only by contract professionals
Specific to mechanical engineers	Yes	Yes	No, civil engineering mostly	No, various fields covered
Collaboration between the parties	Very fair if the parties are well described and the roles well defined	Very fair if the parties are well described and the roles well defined	Very fair if the parties are well described and the roles well defined	Fully explained and detailed process to tri parties
Intellectual Property	Mentioned in the detailed list of the points to look at closely	Not mentioned	Not mentioned as this standard is mostly used for civil engineering	Not mentioned

Resolving the Disputes Process	Extremely well described resolving process (plus the mention of a dispute adjudication board)	Well described with all the necessary steps	Very well described, all the process is stated	Well described with all the necessary steps
Dealing with Delays	Mentioned but not in the way to deal with them	Mentioned and linked to resolving processes	Many kinds of delays are mentioned and detailed	Mentioned but in specific cases not applicable in our scope
Shared Risks	Discussed in the risk allocation part of the standardized contract	Not mentioned	Not mentioned	discussed in the risk allocation part of each different contract

Table 1: Multi Attribute Decision Matrix of the different criterion upon each attribute

Step 6: Ranking of the alternatives

Based on the major attribute ‘specific to mechanical engineers’, find below the analysis comparing the contracts from FIDIC and EJCDC as all the other contracts are not relevant to us.

Criterion	FIDIC	EJCDC	FIDIC vs EJCDC
Easy to use	Complete template with an exhaustive list of points to look at closely and develop if needed in the project	Very complete, covered already most of the areas	Worse
Specific to mechanical engineers	Yes	Yes	Specific to mechanical engineers
Collaboration between the parties	Very fair if the parties are well described and the roles well defined	Very fair if the parties are well described and the roles well defined	Draw
Intellectual Property	Mentioned in the detailed list of the points to look at closely	Not mentioned	Better
Resolving the Disputes Process	Extremely well described resolving process (plus the mention of a dispute adjudication board)	Well described with all the necessary steps	Better
Dealing with Delays	Mentioned but not in the way to deal with them	Mentioned and linked to resolving processes	Worse
Shared Risks	Discussed in the risk allocation part of the standardized contract	Not mentioned	Better

Table 2: FIDIC and EJCDC contracts compared

Based on the table and the different criteria chosen, FIDIC contracts seem to be the most efficient and relevant one for the mechanical engineering consultancies. Even though the FIDIC contracts seem better compared to the EJCDC ones, some points deserve to be taken carefully to make sure all the points are covered and none of those is kept hidden.

Step 7: Performance Analysis

This analysis of the main attributes regarding the contract's related to mechanical engineering consultants leads to a ranking of the performance of the contracts itself. The choice of the attributes, the level of detail and the main goal of the contract can make the result change. Even if this is a recommendation, always keep a close look at what are the different clauses and terms before agreeing to any signature.

CONCLUSION

FIDIC contracts are the most appropriate ones to deal with mechanical engineering project, they are specially designed for this purpose and deal with all the specific clauses related to this topic. However, they are the most fitted for this purpose, whoever use them, need to be careful about the clauses and the different specification which could come out from the project itself and the needs of the client. These contracts need to be as fair as possible to ensure the satisfaction of all the parties and maximize the chance of a further collaboration.

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Lucien ROCK is a student from Lille, North of France. He spent most of his young life living in France, from primary school to high school. After graduating with honours, he took the opportunity to join a special engineering school named ITEEM in France. This formation is a great joint venture between the Ecole Centrale de Lille and Skema Business School to offer a unique double competence degree in 5 years. During his studies, he had the amazing opportunity to take an internship in India for 8 months and discover a whole new world.

Now in his last year of study, Lucien specialized in Advanced Mechanics on the engineering side and choose to do at the same time a MSc in Project and Program Management and Business Development at Skema Business School. He will graduate in April 2018 and is looking for new opportunity in a foreign country in the project management and engineering field. Lucien can be contacted at: rocklucien@gmail.com.