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I hereby declare I have written this master thesis independently and quoted all the sources of information used in accordance with methodological instructions on ethical principles for writing an academic thesis. Moreover, I state that this thesis has neither been submitted nor accepted for any other degree.

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Claim management EPC/turnkey projektů

**Claim Management of EPC/Turnkey
Projects**

Abstrakt

Diplomová práce se zabývá claim managementem a řešením sporů ve stavebnictví. Zprostředkovává porozumění problematice claim managementu se specializací na Engineering procurement construction (EPC) projekty, které mohou být shodně označovány jako projekty na klíč. Podrobně se zde řeší způsoby řízení claimových situací v průběhu celého životního cyklu projektu. Tato diplomová práce se zaměřuje na získávání informací od různých interních a externích aktérů. Důraz je kladen na objasnění a analýzu otázek souvisejících s diskusí o možných zlepšeních. V první části práce jsou popsány teoretické znalosti claim managementu v souladu s aktuální literaturou. V části druhé jsou vysvětleny konkrétní případové studie s doporučeními jak se jim vyvarovat nebo jak řešit podobné situace, které by mohly vzniknout v budoucnu.

Abstract

The master thesis is dealing with Claim Management and dispute resolutions of construction projects. It mediates the understanding of Claim Management in Engineering procurement construction (EPC) projects (also called turnkey projects) and how claims are managed throughout the life cycle of the project. This master thesis focuses on obtaining information from various internal and external actors, aiming at a general understanding of the process and issues related to the discussion of possible improvements. In the first part of the thesis, there is described theoretical background of Claim Management in line with contemporary literature. The second part introduces specific case studies with recommendations of preventing or dealing with comparable disputes that could arise in the future.

Klíčová slova

Claim management, řešení sporů, řízení projektů, soudní spory, rozhodčí řízení, mediace, případové studie, dodavatelské systémy ve stavebnictví, zainteresované osoby ve stavebním procesu

Keywords

Claim Management, dispute resolution, project management, litigation, arbitration, mediation, case studies, project delivery methods in the construction industry, stakeholders of the construction process

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1 Introduction

In life, whether in the case of contractual or interpersonal relationships, sooner or later, claims/disputes arise. Generally, claims come up primarily because of the difficulty and complexity of construction projects and the high number of stakeholders involved in a project. Claims, change orders, and other changes are historically a standard part of contractual matters between contractors and owners of the construction industry. The importance of these documents is becoming increasingly more substantial and more significant for suppliers, mainly due to the dynamically changing environment of the construction industry, and because of the high number of disputes during approval of contract changes. (Levin 1998, p. 11, chapter 24)

1.1 The Aim of the Thesis

This master thesis aims to bring light and mediate the understanding of claim management in Engineering procurement construction (EPC)/turnkey projects. It focuses on how claims are managed throughout the life cycle of the project. Mainly from the general contractor point of view, this master thesis presents obtaining information from various internal and external actors, aiming at a general understanding of the process and issues related to the discussion of possible improvements.

The goal of the first part will be to describe dealing with claim situations in line with related literature. As well ways how to standardize the process of claim management in construction or project management companies will be presented at beginning chapters. The second part of the work will aim to identify the current causes of disputes and claims and to provide a deep understanding of cases of actual conflicts. For this purpose, it will be used facts of real disputes throughout the project lifecycle. In the general contractor point of view, the thesis will provide an in-depth analysis of actual conflicts. It will try to bring valuable information for further enhancements of projects.

1.2 The Purpose of the Thesis

The purpose of this thesis is to clarify and determine the causes of claim situations in EPC projects. It shows how to deal with claim situations on EPC projects in order to contemporary literature. To elaborate this thesis, there are used mainly “guides for practicing engineers” and books with similar themes especially related to project management and inseparably to claim management. The used literature reflects the present situation of management of construction

projects, however, for actual information, there are used few web pages and professional journals. The thesis shows how to deal with contracting parties on disputes of particular projects, but there is need to pay attention to the way how situations are handled because with these parties the company usually has not only one concluded contract.

1.3 Research Questions

Following research questions were set up for accurate clarification of thesis goals.

- Why prefer alternative dispute resolution methods instead of the litigation?
- How solve specific of solutions of typical situations?
- How to prevent claim situations?
- What are the most common causes of claims?
- How to deal with claim situations?

Firstly, these questions will be described in a theoretical way in line with today's literature of dispute resolution problematics. Secondly, the questions will be answered based on a few real claim situations.

1.4 Delimitations

The thesis is focused mainly on the solution of claim situations especially for EPC/turnkey project types, but for comparison, there are briefly described some procedures that are also used in other delivery methods. The work does not describe the way of financing the projects which might have some connection with the way of solving the mentioned cases. It does not directly characterize the specific terms of conditions and contracts.

2 Main Terms

In this part of the thesis, it will be described the theoretical background which is related to the topic of this thesis. This chapter will present terms of construction projects and claim management to a better understanding of the context.

2.1 Construction Project

The term "construction project" means a unique sequence of complex processes. In other words, it is a process that leads to the transformation of the idea given by the investment intention into a workable construction. Every project is unrepeatable and time-bound. (Barron, Barron 2009)

Three primary phases characterize the construction project:

Pre-investing phase/Initiation phase

It starts with the first idea of the investment plan and the realization of the project, which is followed by the decision about the ideal variant and ends with the decision whether to proceed or not with the project. (Barron, Barron 2009)

Investment phase

Besides, this phase is divided into three different parts: Investment preparation, which takes place until the moment in which the project is placed under construction by the contractors. Implementation preparation, which lasts until the start of the work on the building site. Realization of the building, which ends with the verification of all building functions, user training, and commissioning. (Barron, Barron 2009)

Stage of use/operation

It begins with the use of the building/construction work for the purpose it was built for, the operational reliability test and the assessment of how the construction project's objectives were met.

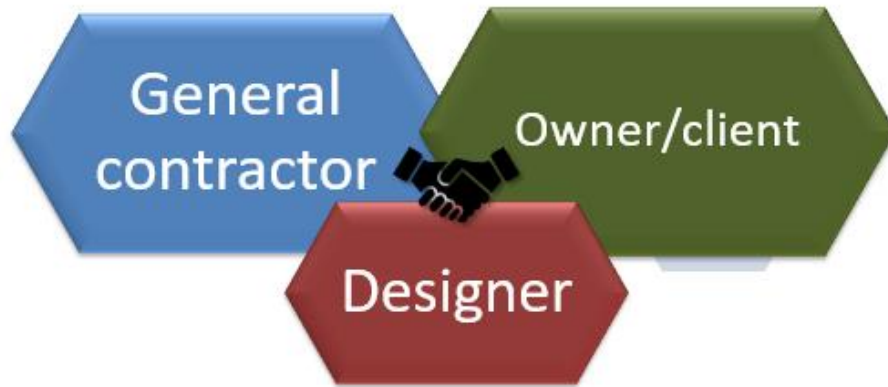
2.2 Stakeholders

Participants in the construction process are called stakeholders. They are commonly divided into internal and external stakeholders, according to their involvement in the project.

The **internal stakeholders** are the participants who are in direct relationship with the project, e.g., employees, ownership or investment. On the picture below are shown the three most

common internal stakeholders of a construction project. The primary three stakeholders are the general contractor, owner, and designer as it is shown in Figure 1. Their brief duties and features are described in the following paragraphs.

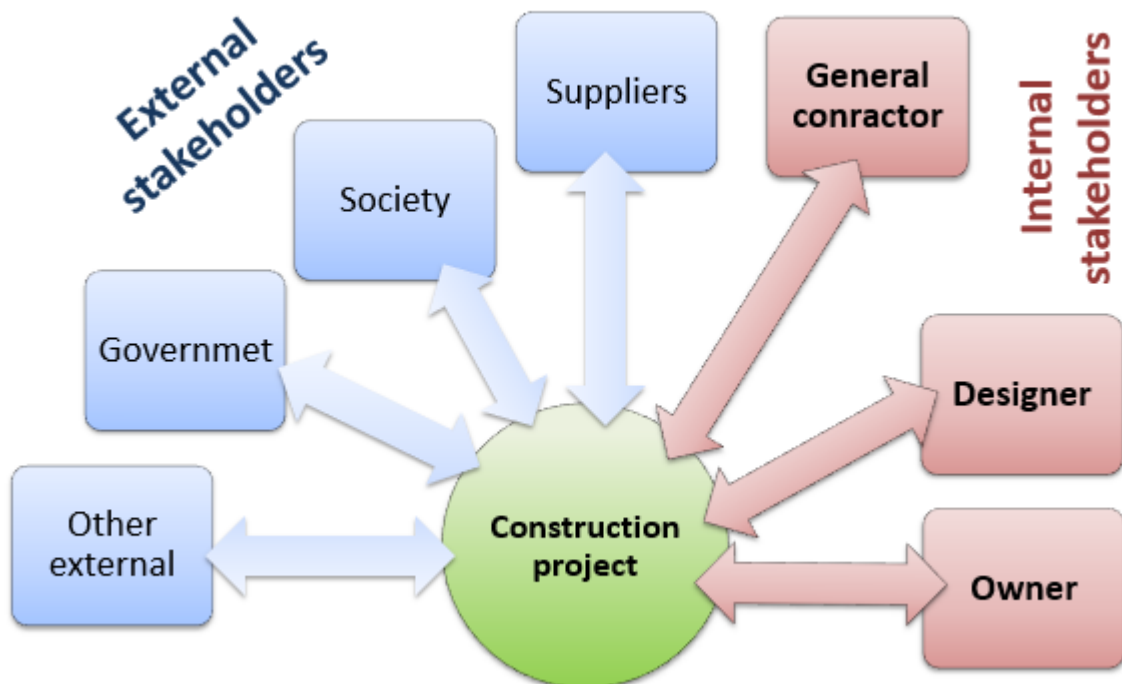
Figure 1 Internal stakeholders



Author, inspired: (Courses lumenlearning 2015)

The **external stakeholders** are those participants who are not directly connected to a project but are somehow affected by activities of the project or company. This group includes e. g. Suppliers of goods, creditors and public groups (Investopedia 2018). These entities and their short specification are showed in the picture below and the following paragraphs.

Figure 2 Stakeholders



Author, inspired: (Courses lumenlearning 2015)

Construction projects involve coordinated activities of many different professionals and specialists to achieve defined goals. The main task is under construction of the project management, whose task is to bring responsible and qualified people into the project and to coordinate their activities so that they can effectively carry out their work.

2.2.1 Project Contractor

Contractor means any natural or artificial person who delivers goods, provides services or performs construction work. It is responsible for the quality of the work done. Qualification prerequisites are presented in the following chapters. (Barron, Barron 2009)

2.2.1.1 Qualifications of general contractor

Verification of qualifications must be ensured in the tender procedure so that entrants who do not have the qualifications are not eligible or have no authority to perform the construction and other required activities. The tenderer proves with these assumptions that he is able to fulfill the subject of the public contract. The contracting authority determines the requirements for proof of qualification. The professional, economic, financial and technical qualifications need to be met for the success in a tender.

Proper knowledge and experience are essential for all contractors. Based on this experience and knowledge, they decide to manage the company and projects, which is unwillingly and directly associated with the claim management. Failures of companies are not normally caused by common environmental problems, such as unfavorable weather conditions, labor problems, inflation or fluctuating markets. The cause of failure is mostly mismanagement. Behind the failure of companies is typically hidden the sequence of bad decisions that can lead to the bankruptcy of the company. To do good business, it is essential to see and study these bankrupt companies. (Schleifer, Sullivan, Murdough 2014)

Qualifying requirements for the contractor vary from state to state. In the following paragraphs are generally described the qualification and requirements of general contractors for public works in the territory of Europe union, which are inspired by the publication (PUBLIC PROCUREMENT GUIDANCE FOR PRACTITIONERS 2015). Similar requirements for contractors could be also used in tendering in the private sector.

Fundamental qualification features:

It is necessary for any contractor to meet these requirements:

- It has not been finally convicted of a criminal offense in favor of an organized criminal group.
- Who has not been finally convicted for a criminal offense, whose facts are related to the subject of the contractor's business according to special legal regulations.
- Whose assets are not in progress or the insolvency proceedings have not been completed in the last three years.
- Which is not in liquidation.
- Which does not have tax debts in the tax records, both in the country of operation and in the country of residence, place of business or domicile of the contractor.
- Who has no sum unpaid on the insurances and penalties for social security and the contribution to the state employment policy.
- Who has not been legally disciplinary punished or has not been legally sanctioned by disciplinary action under special legal regulations in the last three years.
- Which is not in the register of persons with a ban on the performance of public contracts. (In the tender for a public contract)
- Who has not been legally sanctioned for enabling illegal work in the last three years.

Professional qualification features:

It is necessary for every contractor to submit the following documents:

- Recent Certificate of Incorporation
- The document on a business license pursuant to special legal regulations to the extent corresponding to the subject of the contract.
- A document issued by a professional organization demonstrating its membership in this organization.
- A document certifying the professional competence of the contractor or the person through whom it ensures its professional competence.
- A document that demonstrates the ability of the contractor to ensure the protection of classified information according to the appropriate type of protection of classified information when performing a public contract in the field of defense or security.

Economic and financial qualification:

It is necessary for every contractor to submit the following documents:

- The insurance contract, which deals with liability insurance for damage caused by the supplier to a third party.
- The latest balance sheet prepared according to special legal regulations.
- An indication of the total contractor's turnover as determined by special legislation.

Technical qualification assumptions

In order to meet the technical qualification requirements, the project owner may require these documents:

- The list of significant deliveries made by the contractor over the last three years including their scope of work and real time schedule.
- The list of technicians or technical services involved in the performance of the project.
- A description of the technical equipment and measures used by the supplier to ensure quality and a description of the equipment of the contractor for conducting the research.
- Verification of the production capacity control by the contracting authority or by another person on its behalf.
- Samples, descriptions or photographs of goods to be delivered and documents evidencing the quality
- A document that is proving conformity of the required product issued by the competent authority

2.2.2 Owner/Client

The owner of the project is the person who wants to realize the project for the sake of some benefit. Owners could be private or public contracting authority: the main difference between them is in the source of the work financing and the future purpose of the realized projects. (Levy 2009)

2.2.2.1 Private owner

A natural or artificial person who finance the work from own resources or commercial credits. It signs a contract for the work with the contractor. It may not be selected in the tender if it is not required. (Barron, Barron 2009)

2.2.2.2 Public owner

It is mostly an artificial person who wants to realize the project that purpose is the benefit of the public. It signs a contract for the work with the contractor. The source of funding projects is the state or another public budget. The following list shows the public owners primarily:

- The state;
- State contributory organization;
- Semi-budgetary organization;
- Self-governing territorial unit;
- Another artificial person if it is established to meet public interest needs or is predominantly funded by the State or other public entity.

(PUBLIC PROCUREMENT GUIDANCE FOR PRACTITIONERS 2015)

2.2.3 Designer

It is a natural or artificial person (designer or design office). The main task of the designer is to provide vision, drawings, and specifications of the project. The designer may also perform oversight and author's supervision during construction. (Barron, Barron 2009)

2.2.4 Vendors

The vendor is one of the stakeholders whose task is to deliver goods or provide services.

The (Investopedia 2018) specify term vendor as follows: *“The term "vendor" typically is used to describe the entity that is paid for goods that are provided, rather than the manufacturer of the goods itself. It is possible, however, for a vendor to sometimes operate as both a supplier (or seller) of goods and a manufacturer. “*

2.2.5 Parties involved in Litigation

Claimant

It is a person who initiates the claim process and raises a request because it feels damaged. The Cambridge dictionary specifies the claimant like: “A *person who asks for something that they believe belongs to them or that they have a right to.*” (Cambridge dictionary 2018).

Defendant

It is the party of the litigation process which stays against the claimant. The (Cambridge dictionary 2018) specify it as:

“A person in a law case who is accused of having done something illegal.”.

2.3 Fast Tracking

Fast track a project means to work on parts of a project simultaneously and not to wait for completing one to start another one. Work can also be accelerated by adding labor, but it does not go to infinity. From a certain number of workers, the fast-tracking becomes ineffective, and it starts delaying, mainly because of coordination and limited workspace.

The fast-tracking is excellently presented by (Sears, Clough, Sears 2008) that describes it as:

„Fast-tracking refers to the overlapping accomplishment of project design and construction. As the design of progressive phases of the work is finalized, these work packages are put under contract, a process also commonly referred to as phased construction. Early phases of the project are under construction while later stages are still in the design process. This procedure of overlapping the design and construction can appreciably reduce the total time required to achieve project completion. For obvious reasons, fast tracking and phased construction sometimes can offer attractive advantages to the owner and also can be the source of severe coordination problems. “.

3 Contract Life Cycle with emphasis on Claims

The prosperous contractor knows that contract and its price variations may occur and may arise throughout the project. For efficiency in making contract price changes, the contractor must have a well-defined procedure and identify potential changes and monitor them through different degrees of approval processes.

One of the basic principles that a contractor must follow when managing changes of a contract, is no commencing of work beyond the original scope until the authorization has been signed (change order) by authorized persons of the designer and the owner. This written permission is generally referred to an authorization to proceed. When the time schedule is in the approval process and project must continue, it is not practical to wait for this authorization. Therefore, many vendors are forced to start working on a potential change only with verbal permissions. This circumstance increases the importance of maintaining current project documentation, including all valid changes. For documentation of the change, it is necessary to partially modify not only the drawings but also the contractual scope of the work that usually reflects the price and duration of the project. To the change of document, it is needed to use the precise system of forms, which should not be consistent throughout the project. (Levin 1998)

Correct communication between all parties including owner, architect or engineer, general contractor, subcontractors, and suppliers helps to guarantee that this work will be:

1. Done with fewer problems;
2. Completed in time;
3. Built to the satisfaction of the owner, architect or engineer;
4. Profitable for all parties.

For general contractors or subcontractors is necessary to understand the life cycle of the contract and changes that may arise in each phase and its relevant requirements and consequences. Chapters 3.1, 3.2, 3.3 and 3.4 describe problematics of individual phases of the contract life cycle in detail.

3.1 Pre-Bid/Bid

In this initial phase, that is also called Pre-bid or bid, the contractor should sensitively deal with available data from owner, architect or engineer, and itself records and books. Data source depends on delivery method. These data originating from the contracting parties must be

checked for completeness if not, the using of bad data could lead to a wrong or mostly undervalued bid. Good knowledge of own record and books is mainly essential to ensure that the income for the project works will cover the indirect costs associated with the project. Insufficient availability of information can lead to the increase of future contractor's changes, that may cause claims or even the contractor bankrupt.

3.2 Contract Award

The process of contract awarding offers an excellent opportunity to influence the procedure of handling with changes and negotiating relevant changes of contract. Examples of contract change options for better handling with changes and resolution of disputes are noted below.

The contract must specify the process that handles the dealing with change orders, or a process that specifies the conditions for increasing, valuing, and declaring change orders. The contract must state, how the change order and the extras will be treated.

For long-term projects, it is advantageous to have force account rates specified in the contract. These rates determine the actual costs of labor, materials, tools and supplies equipment and margins.

The contract may also include a clause that will determine responsibilities of contract parties for a dispute resolution in an alternative way (such as mediation or arbitration).

An excellent way to overcome disputes is the explanation of contract language, that will be dealing with unfamiliar conditions. Poor interpretation of a contract is a frequent source of changes, which usually cause conflicts and claims.

The financial risk could be reduced by negotiation of reducing the retention of specific jobs during the performance of the contract. For example, the reducing of retention on the one half, after the completion of fifty percent of all scope of work or payment of full retention.

3.3 Contract Performance

In accordance with the right execution of the contract, it is also imperative the accounting of all contract activities in line with the managerial information system of the company. Entire contracting activities, procedures, and controls, that will ensure the correct recording to the information system of the company must prepare and well functioned. Every information from the start to the end of the construction contract should be defined by the project manager and

confirmed by company management. (CFMA 1988) shows some items that might be important for the change order process:

- Daily logs;
- Job site diary;
- Project correspondence files;
- Daily reports;
- Project schedules;
- Job site photographs or videos;
- Work order authorizations;
- Separate cost codes in the job system for change order extras, and back changes.

The inability of the project manager to provide any of these items could have a harmful impact on the contractor's capability to determine, get approval and reach changes to the contract. Qualitative data requirements should be included in the contract to prevent disputes. Obtaining of information on the site should be done continuously and if the project manager is not directly responsible for this information, then another employee, who will be responsible for it, should be assigned. The data processed primarily for the change orders should be consistent and in accordance with the company's internal regulations or directly with the relevant work contract.

3.4 Contract Completion

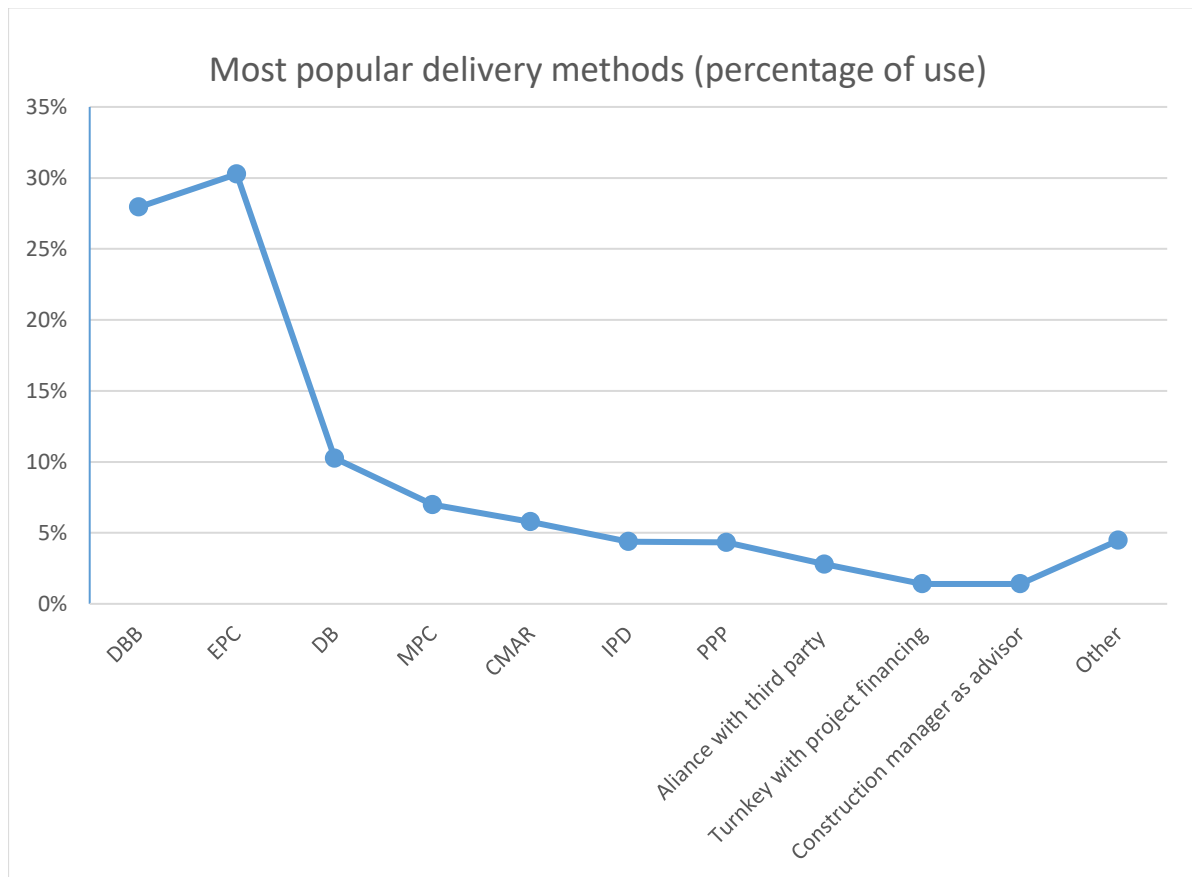
In this phase, the owner and contractor should have to make a clear picture of which works are rightly completed. They should agree on methods for compilation of punch list. Without clear agreeing and dealing with contracting parties, it could be problematical to deal with liquidated damages and provisions. As well the timeframe for solving the failures could be significantly prolonged at the end of the project. (CFMA 1988)

4 Project Delivery Methods

The accurate choice of the project delivery method is essential especially for the proper provision of the contractual and organizational requirements of the project and for meeting the specific needs of the project. The project delivery method specifies a correlation between the level of risk and the level of control over the project. In another meaning, the type of delivery method determines the rights and obligations of individual contract parties (internal stakeholders). (Flintco 2016)

Figure 3 shows the most popular delivery methods and their percentage of use in construction projects of public and private jobs.

Figure 3 Most popular delivery methods



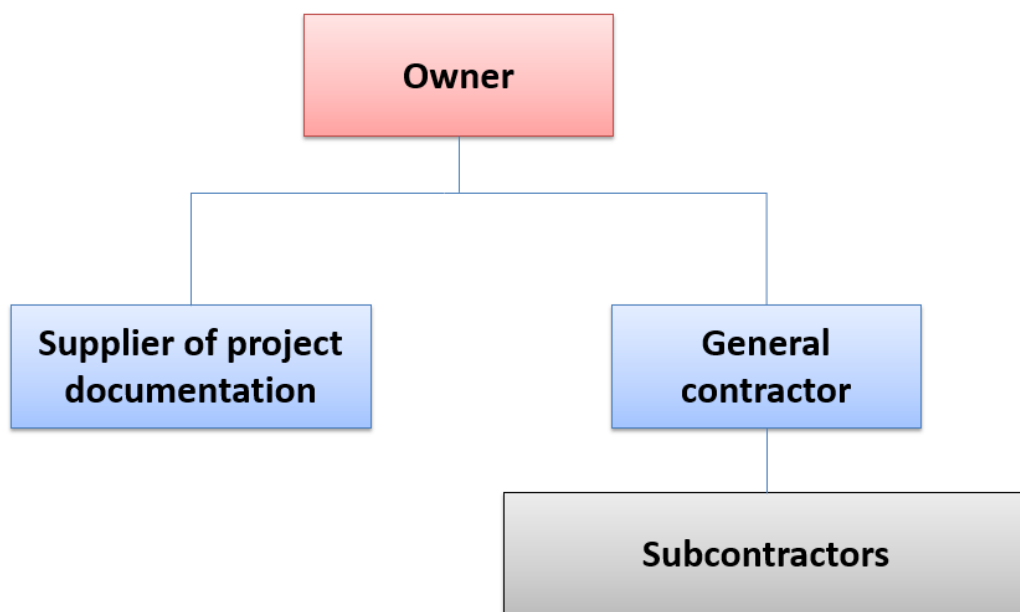
Autor, data source: (KPMG Global construction survey , 2015)

For a better understanding of how the EPC/turnkey delivery method works, there are briefly introduced the other delivery methods. There are presented brief descriptions of methods and their main advantages and disadvantages.

4.1 Design Bid Build (DBB)

In the case of DBB contracts/projects, the owner concludes contracts with two parties. The first person is responsible for the constructing of the project. The second one is responsible for the supply of construction documentation. The general contractor is usually chosen by the tendering procedure as the lowest bid. Primarily due to the complexity of construction projects, the general contractor uses many subcontractors. (Walewski, Edvward Gibson, Jasper 2001)

Figure 4 Design Bid Build



Author, inspired: (Structuretec 2008)

Main advantages

- Every owner, contractor, designer of the construction industry has wealth experience with this delivery method.
- Tendering of general contractor ensures the excellent cost of the project because of the competitive environment of the construction industry.
- The accurate conception of the cost of the project.
- Usually, the price for the work is fixed and unchanging for the basic scope of work.
- The possibility of the well-estimated cost of the project is good for right choice the best contractor.
- The Relative simplicity of the organization of construction in investor scope of view.
- The transfer of risk to the general contractor (in case absence of changes).

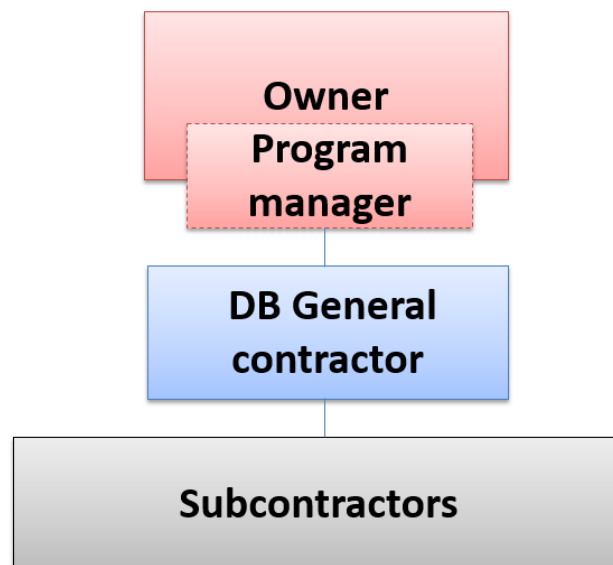
Main disadvantages

- Usually, separate conferencing and negotiating of contracting parties.
- The general contractor does not have the opportunity to use its contribution to improve the economy of the project.
- Problems of inaccurate project documentation or bad-understanding of project documentation (disputes and possible claim situations).
- Unforeseen circumstances that require amendments to the contract.
- The method of construction requires a strict sequence of the project phases and makes it impossible to save time.
- Each change of project requires pricing and term additions to the contract (change orders and amendments main contract).
- The squeeze on the contractor's cost may lead to the use of low-quality subcontracts.
- The high owner's requirements in the field of design organization and approval procedures.

4.2 Design-Build (DB)

In the case of DB projects, the owner concludes the contract with only one person (general contractor) that is responsible for delivery of all project. The general contractor ensures the project documentation and the delivery of all construction works. These general contractors are typically construction management companies that have own design office. In this delivery method is a vast opportunity for optimization between project design and production capacity and abilities of a construction company. The primary owner's advantage is the simplicity of this contracts relationship. He has to deal only with the one contracting party that is responsible for the all project. The company that oversees the whole project is fully responsible for the quality, cost, and timing of work. For all conflicts that may arise between design and construction is responsible for only one overseeing company. The DB company is responsible for the complete project and cannot move any defects to other contracting parties. That is why it is motivated for doing quality design and works. (Delivery Types and Advantages 2014)

Figure 5 Design Build



Author, inspired: (Process Plant Project Delivery Methods 2012)

Main advantages

- Transfer of risks to the general contractor.
- The owner usually knows the total cost of the project at the signing of the contract.
- The owner concludes an only single contract with the general contractor.

- The owner is signing only one contract for delivery of the project.
- Due to the fact that there are only two main contract parties, the communication between them is more straightforward.
- The possibility of active time planning (fast-tracking).

Main disadvantages

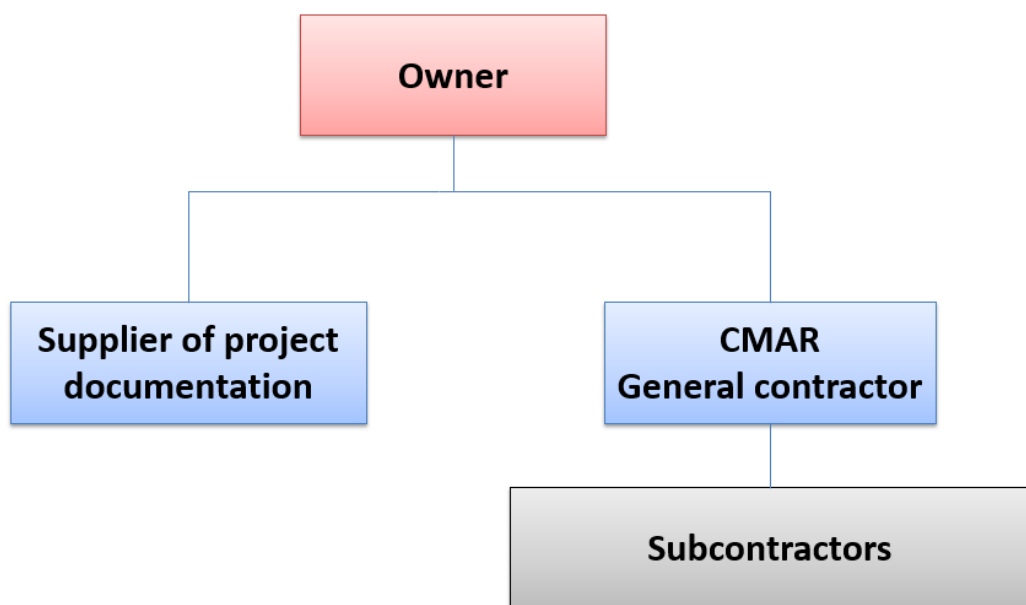
- The owner loses control over the project partially.
- Any requirement that was not specified in the tender documentation could cause the contract amendment.
- Changes initiated by the owner may be relatively expensive in comparison to DBB.
- The owner must be able to formulate and communicate its idea of the project correctly.
- High involvement of experts at the beginning of the project. (cost increase).
- The necessity of a sophisticated study, by which further stages of project documentation are being processed.

4.3 Construction management at Risk (CMAR)

The meaning of this delivery method is providing the professional management of all stages of the construction project for the owner. The General contractor becomes the responsible owner's representative and takes on project risks. Contracting parties conclude habitually a contract with a guaranteed maximum price (GMP) and set a deadline for the project. By this GMP is also agreed on a professional fee for the construction management services. This fee is usually set as a percentage of the cost of the building. This method is increasingly used by public and private clients mainly because it is not so demanding for the owner's qualification and the contractor takes most of the responsibility for the project. The following three responsible persons are usually involved in these types of projects: the owner or its representative, the independent designer-architect and construction manager who is chosen in the selection process.

The CMAR contract includes two agreements. The first one is for coordination and management in the stage of preparation of project documentation and designing and the second one for construction of the building. These agreements include a set of business and technical assignments for the program manager. In the contract, there is usually a clause describing how potential savings will be split between the owner and the general contractor. (Flintco 2016)

Figure 6 Construction management at Risk



Author, inspired: (Process Plant Project Delivery Methods 2012)

Main advantages

- The potential for fast-tracking, shortening of the project schedule.
- CMAR is quite risky method for the owner.
- Allows contractor's innovation.
- Estimates of costs under previous projects.
- Reducing the owner's management skills requirements.
- Working with milestones and a fixed fee is motivating the general contractor.
- The professional expertise of the general contractor.
- Fast transfer of requirements to contractors.
- An active solution of project problems.
- Possibility to make changes in later phases.
- Possibility to use local suppliers and subcontractors.

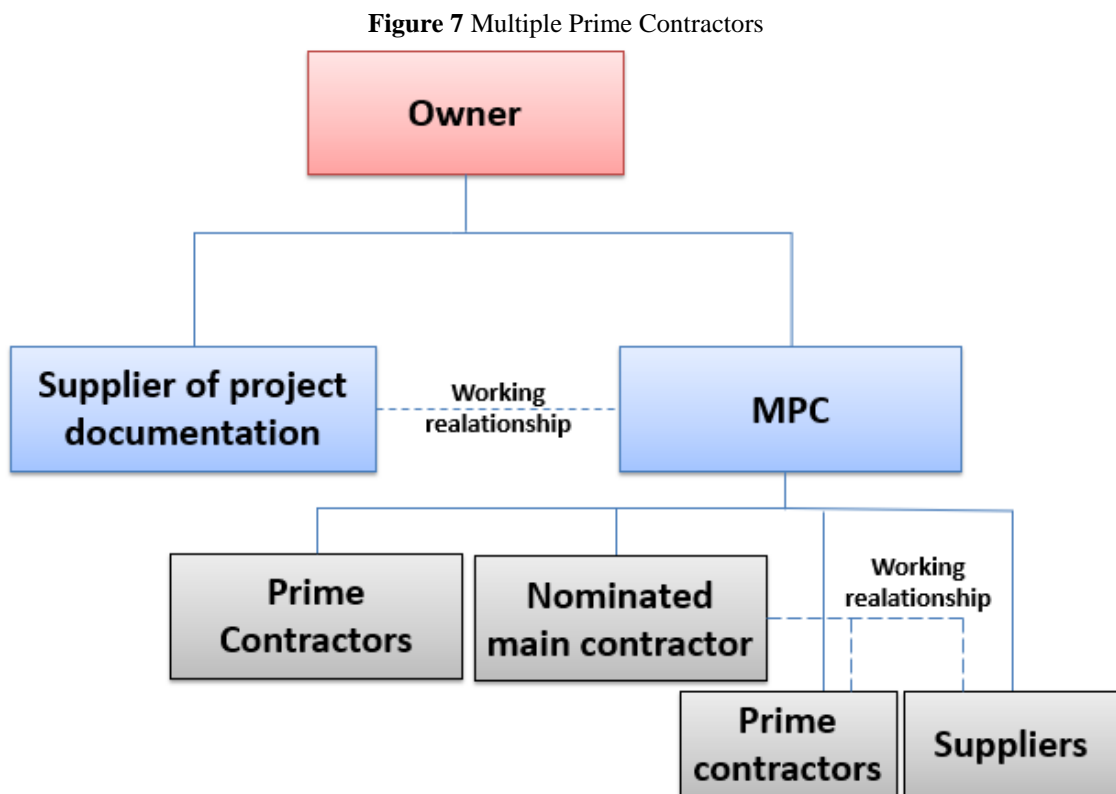
Main disadvantages

- Effective only for vast projects.
- The possibility of quality, price, schedule claims with CM as a general contractor.
- Disputes about changes in the project depending on milestones.
- The owner retains responsibility for the design.
- The general contractor may not come at the same time as a designer into the project.
- Setting up of milestones can lead to a crisis in the project.
- General contractor controls all subcontractors.
- Reduced control of the project owner.
- Expensive potential changes required by the owner during construction.

4.4 Multiple Prime Contractors (MPC)

MPC type of project is dealt with similarly as the traditional design-bid-build system, but the owner uses more direct supplier contracts to avoid a classic situation where the general contractor plays an essential and irreplaceable role.

A skilled owner can coordinate the whole project individually. Responsibility and risk assessment must be obviously identified or transferred to biggest contractors of the project. All project works on the relevant sections of the construction must be properly coordinated by the main responsible contractors. An inexperienced owner delegates these activities to the construction manager (Construction management company) or project manager and advice on all procedures. It is necessary to formulate relationships and responsibilities with consultants in the contract precisely. (Delivery Types and Advantages 2014)



Author, inspired: (Process Plant Project Delivery Methods 2012)

Main advantages

- Reduction in price due to partial removing margins of the general contractor.
- The owner holds and controls all subcontracts.
- Segregation of work areas.

- Direct communication with suppliers.
- The potential for earlier involvement of contractors into the project.
- Supplier selection based on their performance and quality.
- Increased opportunity for local suppliers and subcontractors.
- Chance for fast-tracking.

Main disadvantages

- Increased requirement of coordination.
- The possibility that some works could be duplicated or omitted.
- Increased administrative requirements.
- The final price is not known until the final suppliers are selected.
- Lack of authority.
- Delaying one supplier may lead to a delay in sequential suppliers.
- The potential for many claims between suppliers.
- Higher costs and other change orders.
- Possible bad quality of works.

4.5 Public-Private Partnership (PPP)

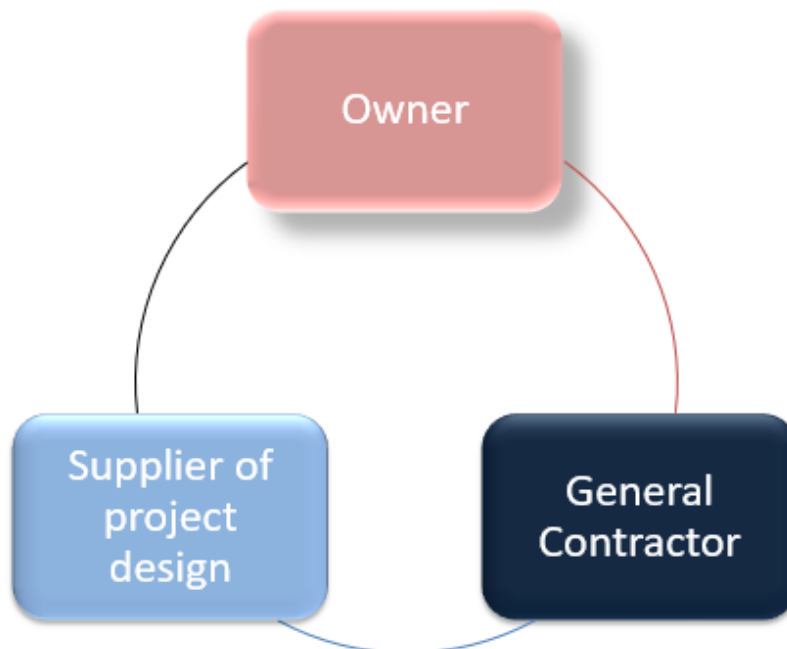
It is not an exact delivery method as the others of Chapter 4. This system defines the primary business relationship between the owner and general contractor, and way of the financing. Public-private partnership (PPP) is closed between parties of the public sector (e. g. government) and a private company. The primary idea of this method is to finance public projects by private investors. Constructing of projects by a partnership of public and private parties ensures finishing of project sooner primary due to the financial engagement of the private company that is responsible for the results of a project. (Investopedia 2018)

4.6 Integrated Project Delivery (IPD)

IPD is a modern delivery method that essence is the organizational and timely involvement of building managers and critical business contractors together with the owner and designer into the project. The selection of the suppliers is done on the basis of qualifications and not by reason of lowest price. The approach of key suppliers', together with the team of designers and the owner in the early stages of the project, is valuable to the project and the balance of relationships.

The IPD is an attempt to contractually reflect the relationships and efforts that are possible only if the project team cooperates as an integrated team to complement the design and construction of the project. The integrated project team has similar motivation to achieve the same goals that were agreed at the start of the project. Owner's responsibility is to assemble the leading roles of the partners and the roles in the management already in the initial stages of the project, ideally in the feasibility study of the project. (Delivery Types and Advantages 2014)

Figure 8 Integrated Project Delivery



Author, inspired: (Process Plant Project Delivery Methods 2012)

Main advantages

- Early involvement of key stakeholders.
- Reduced requirements for owner managerial skills.
- Considerable coordination of all participants.
- Minimum of owners error.
- Active solution to project problems.
- Allows innovation.
- Possibility to make changes in later phases.
- Potential for fast-tracking.
- The possibility of using local vendors and suppliers or subcontractors.
- Small disputes of all participants.
- Good price and time estimating.
- Flexibility in choice of materials, construction or construction methods.
- Higher quality of the project.

Main disadvantages

- It may be difficult to formulate an agreement.
- The selection of the project team is difficult.
- The absence of accurate cost estimates.
- Lack of experts.
- System failure extensively depends on the behavior of individuals.
- Uncertainty if co-operation is more advantageous than realization in a competitive environment.
- Court proceedings have not yet tested IPD contracts.

4.7 Engineering Procurement Construction Management (EPCM)

Engineering Procurement Construction Management (EPCM) is the professional providing of comprehensive services for the construction of a project, that includes design, procurement, construction management, and project coordination. This type of delivery method is used in cases where the traditional ones cannot work well, because the scope of work is unclear or quantifying of risks is very difficult, and it is complicated to determine how much should the contractor earmark to address this issue. (Delivery Types and Advantages 2014)

In this delivery method, the owner and the general contractor conclude a contract which subjects are the coordination and construction management services. Contracts with other subcontractors and suppliers for delivering specific services and activities are concluded separately. For the sake of clarity, the schema of EPCM is showed in Figure 9.

In line with (Process Plant Project Delivery Methods 2012) this method is useful to use in cases where:

- New or proprietary technologies are used;
- In places with specific sit or country risks;
- When the owner has already the good-functioning delivery team of contractors and suppliers.

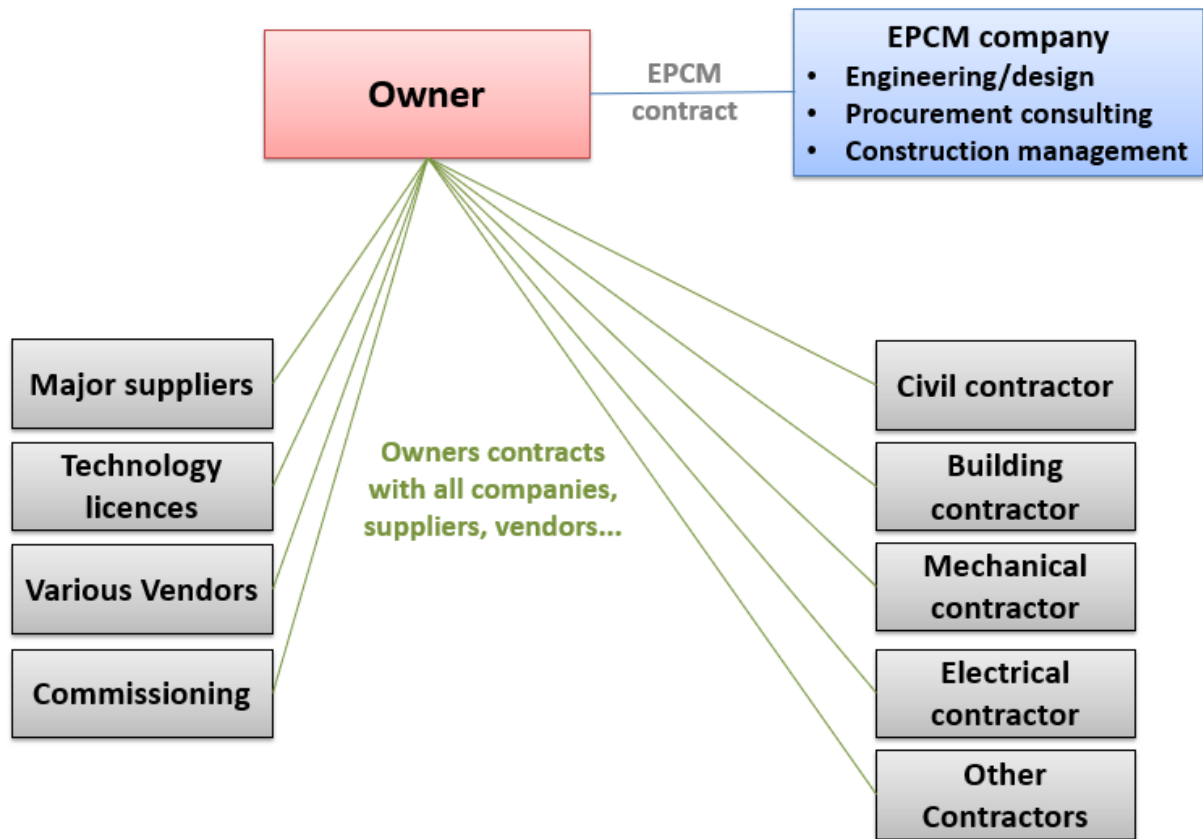
This method became widely used in the last 10-15 years, mostly because it is initially driven by contractors who become increasingly sophisticated in their risk analysis and propose a risk-free margin. Thanks to the enormous popularity of this method, companies that specialize in negotiations between owners and contractors began to emerge.

4.7.1 Comparison with EPC

In general, it is assumed that the cost of a project with the EPCM delivery method is lower than that of the EPC. Widely, because of the minimization of the costs of a general contractor who does not re-sell all the works to the owner. No “coordination” margins are added to each item, due to the direct contracts between the owner and the contractors or suppliers.

However, the EPCM is suitable for owners who have experience in this field. In this method, the risk is passed on to the owner more directly due to the concluding of direct contracts between him and individual project parties.

Figure 9 Engineering Procurement Construction manager



Author, inspired: (Walewski, Edvward Gibson, Jasper 2001)

Main advantages

- EPCM reduces the price of the project if the owner accepts costs, schedule, dispute, and performance risks.
- EPCM handle and organize all design, purchase, and construction as the owner's representative from design conception to commissioning.
- With EPCM delivery method is possible to use fast-tracking.
- The big advantage is that the general contractor profits more than the owner because of specializing in a market of a specific field for unique buildings.
- The advantage of the EPCM contractor is in-depth knowledge of the industry and the experience with the realizations, which reduces the risk of failure of the project.

Main disadvantages

- EPCM contractor probably has a low responsibility for the design of the project, no construction responsibility and low or none responsibility for performance.
- EPCM has slight or no responsibility for extension of the costs or delays of subcontractors and suppliers.
- The owner ought to have secured management and administration of contracts, permits, and claims for the duration of the project by the specialized project staff (project managers, engineers, legal).
- Due to the conclusion of a contract with all parties individually, disputes between them are more likely (e.g., structural design or construction defects).
- EPCM contractor is the owner's consultant only.

4.8 Engineering Procurement Construction (EPC)

For this delivery method is typical that the owner usually concludes only one contract with the general contractor. The general contractor ensures all project activities. His responsibilities include each task from design to commissioning. This delivery method is also called “Design and Construct”. The specific activities of general contractor are: the whole project design, equipment, and materials procurement, legal level of the project, construction, engineering, test operation and put the entire construction into operation, and in some cases maintenance. The Engineering Procurement Construction system has become used for projects of many industries, especially for the manufacturing industry. (Delivery Types and Advantages 2014)

As already mentioned in the first paragraph, the EPC is a shortcut for Engineering-Procurement-Construction. On these types of the project could work more than one contractor. They may agree on cooperation and could delivery project in groupings that are called Joint Ventures. (O’Neal, 2016)

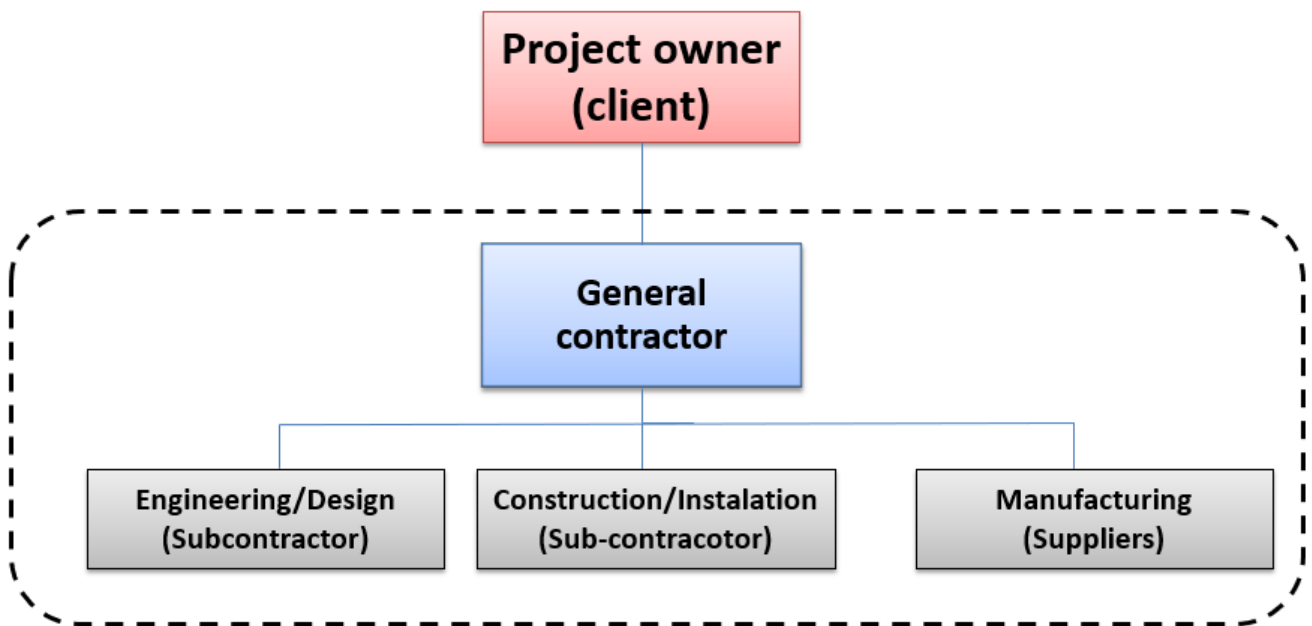
The EPC project is made up of many interrelated activities and processes, which requires a great deal of effort and financial commitment of the contractor. Many subcontractors and suppliers of the entire construction process, that are common for construction projects, making the work of the general contractor considerably complicated.

The contractor is responsible for the whole project, and his job is to ensure all the requirements of the owner. The (Levy 2009) describes the complicated process of the general contractor as follows: *“the process by which the needs, wishes, and desires of an owner or developer are defined, quantified, qualified into clear requirements which will be communicated to the builders or contractors.”*

In order with this delivery method, the general contractor ensures design, procurement of all equipment and building materials, services as “turnkey project” where the price of the project is mostly defined as a lump-sum price. The initiation phase of the project starts with an initial planning and engineering works that define the scope, schedule, and cost of the project. The initial costs can be completed for approximately 1% to 3% of total installed costs. (O’Neal, 2016)

The EPC delivery method gives the great opportunity to contracting parties to tailor the most favorable achievement of all project goals. This generally leads to the creation of a value-based synergic process. The EPC types of projects ensure a reduction of project risk for the owner. It achieves the desired results and maximizes the cost-effectiveness of the entire project.

Figure 10 Engineering Procurement Construction



Author, inspired: (Process Plant Project Delivery Methods 2012)

Main advantages

- The owner has only one contact party of the project.
- The general contractor is answerable for all project (design, engineering, and construction).
- The general contractor is entirely responsible for all costs, time schedules, and performance.
- Project with this delivery method could be well fast-tracked.
- The general contractor ensures performance warranty of the project.

Main disadvantages

- The owner has deficient control over the project.
- Owner's possibility to interfere with procurement and construction issues is very low.
- If the owner has committed a significant interference, the contractor may request a change of work or is no longer subject to performance warranties.
- The owner must pay risk fee for performance warranties and schedule warranties.

4.8.1 Conclusion

The EPC system is in any case one of the most straightforward ways to the most advantageous and top quality contracts. It is helpful for flexible completion schedules and for the highest security standard that are the best for the perfect delivery of the project.

The inherent responsibility of the integrated EPC team basically brings success. The owner finds out that the product, which he received, is in line with his demands and will secure the highest return on investment.

5 Claim Management

The claim is a dispute between two or more contract parties that could not be solved by negotiation or another common business method. In (CFMA 1988) is claim described as:

“amounts in excess of the agreed contract price that a contractor attempts to collect from the owner, customer, or other parties due to the latter group's caused delays or errors or to unforeseen costs.”.

Mostly, the objects of disputes are contracted price or change of schedule. The creation of a claim is a situation when the scope of the work is changed. The scope of work is defined in the contract that documents the contractual relationship between the supplier and the owner in writing. The contract is extended by amendments based on change orders or other records of change of scope of work signed by the relevant persons. (Levin 1998)

Some disputes may last for years until a solution is reached. This may mean that the financial viability of some contracting parties may be less than the time required to settle the dispute. Long-term disputes are mostly linked to increased legal fees, a reduction in cash flow, and an increase in the length of time that this dispute needs to be spent, which could be used to increase the productivity of other activities. The primary priority should be that all means should be used to resolve disputes promptly. It is best if there are no disputes. Unusually long-lasting litigation is particularly undesirable. (Best, De Valence 2002)

Chapter 5 describes possibilities how to deal with claim situations and ways how to standardize these process in construction or project management company.

5.1 Change Order

The change order is a document that specifies price and duration of a new workflow that was not described in the documents by which drawings, sketches, addendums, bulletins, and specifications were processed. (Lambeck, Eschemuller 2009)

Under (Levin 1998) application for change may be initiated by one of these persons or for the following reasons:

- 1) Owner;
- 2) An architect or another design consultant;
- 3) Unforeseen conditions (e. g. Soil conditions different from presented boring protocols);
- 4) Urban governance requirements;

- 5) Missing request for information;
- 6) Inconsistencies in the proposal;
- 7) Latent conditions;
- 8) Potential coordination issues with equipment provided by the owner;
- 9) Acceleration vs. plan;
- 10) Damage caused by insured events (hurricanes, tornadoes, earthquakes);
- 11) Changes in equipment or finishing works that were entered initially but are no longer manufactured.

These causes specify the origin of the claims. If there are any others, it will be related directly or indirectly with these.

5.1.1 Processing Change Orders

In many cases, the design team makes the drawing, specifications determining the changed scope of work and other necessary documentation. These documents are then supervised by general contractor team composed usually of project manager and responsible persons from purchasing department (not if the author of the documentation is general contractors company). Then estimate the project team or specific estimating department compose a fundamental estimation of the change order. It follows confirmation of change order by subcontractors who will perform the work. Subcontractors affected by the change will prepare their change order, which includes indirect costs and profit. Finally, these documents are checked by the general contractor, if they are in line with the costs that the subcontractor offered in the original bid. (Levin 1998)

If the costs are justified and submitted, the general contractor adds to them his margins which, according to (Lambeck, Eschemuller 2009), consisting of:

- Total costs associated with the change;
- Costs assigned to the estimation and purchase department;
- Over time that may be required by an inspector or laborer;
- All permissions that may be required;
- Extension of the rental facility;
- Costs for insurance;
- Bond Costs;
- General overheads;
- Fees.

These margins could be added to the change order just in case if the new work was part of the original bid documents. The total change order is attached to the change request, and then the authorized person approves everything. The most important thing is recording to change order request form any extension of time that would be necessary to complete the work. The authorized person is obliged to sign the request form before commencing any work.

5.1.2 Rejection of Change Order Costs

In cases when authorized party disagrees with the submitted costs, the general contractor is required to perform the work according to the provisions of the contract. On the other hand, to avoid any future claims, the costs and any delays must be resolved. An alternative solution would be to finish the work on a time and material basis with a non-exceeded fixed price.

The project manager and the superintendent should have to record and check daily logs of the time that is necessary to complete the work together with invoices of the material. Moreover, the general contractor has to discuss with subcontractors who perform the work that if they could do works on time and do not produce a low-quality product. If there is enough time, the team compound of representatives of general contractor and designer analyze and estimate alternative methods for doing lower cost work (instead of that, which was initially agreed).

To establishing a well-organized, well-functioning and complete change and claims order program, the general contractor company essentially needs the exact and precise history of each change. To guarantee that this history exists and is updated, the relevant form should be prepared each time when arises potential claim situation or change order is recognized. These forms should be created and updated by the project manager and his project team. Such a record will ensure that all essential background data are documented and that the necessary steps are taken. (Lambeck, Eschemuller 2009)

5.1.3 Back Charges

In constructing industry, the term back charges signify charges for work done, performed works and costs incurred by one contracting party (very often the general contractor) and should be performed or incurred by another contracting party (subcontractor or supplier). Usually, costs for back charges are not billed separately, but they are deducted from the total sum that is owed under the purchase order or contract of the subcontractor.

In order with (CFMA 1988), the most typical and usual back charges are from the general contractor to suppliers or subcontractors because of budget items as:

- unloading equipment or materials;
- clean-up;
- punch list completion;
- repair of imperfect work;
- use of the equipment of the general contractor.

There are also comparable back charges from subcontractor to the general contractor and from the general contractor to the owner, which are mostly become to change orders or extra work orders as an alternative of back charges because they require approval or agreement before recovery is assured. After the completion of the contract, but before the final payment to the subcontractor or the supplier, the final amount will be settled between the general contractor and the subcontractor or the supplier. Disagreement with the back charge can cause claim situation. (CFMA 1988, p.. 1085)

5.2 Basic Procedures for Claims and Change Order Administration

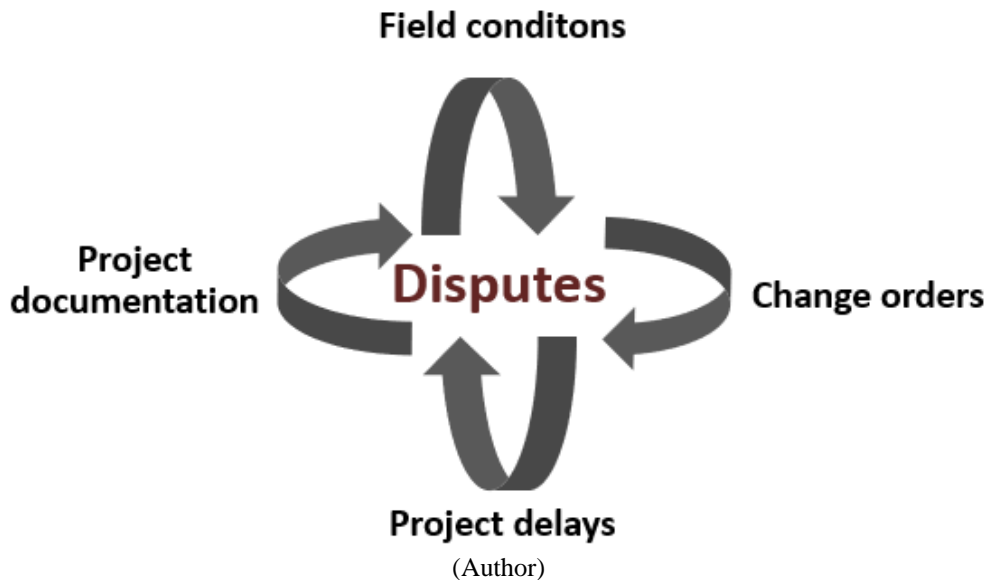
In order to secure and minimalize chances of satisfactory and valuable return of claims and change order, the general contractor must use systematic procedures and methods for managing all claims and change order situations. In the list below are the most critical procedures for administration of claim and change orders that are inspired by (Levin 1998).

- Contract knowledge-ability to recognize and identify changes;
- Notification;
- Systematic and accurate documentation;
- Analysis of time and cost impacts;
- Pricing;
- Negotiation;
- Dispute resolution and settlement.

5.3 Why Claims Arise?

Generally, claims arise primarily because of the difficulty and complexity of construction projects and the high number of stakeholders. The reasons for arising claims are not easy to identify every time, whenever in this chapter will be attempting to identify these reasons by the related literature. Figure 11 briefly illustrates four primary reasons, “Why do claim arise?”

Figure 11 Basic reasons of arising claims



(Hadikusumo, Tobgay 2015) specifics reason for arising of claims as:

“When one party believes that the other party has not met the contractual obligations or expectations and that they deserve monetary and/or time compensation, they may submit a claim.”

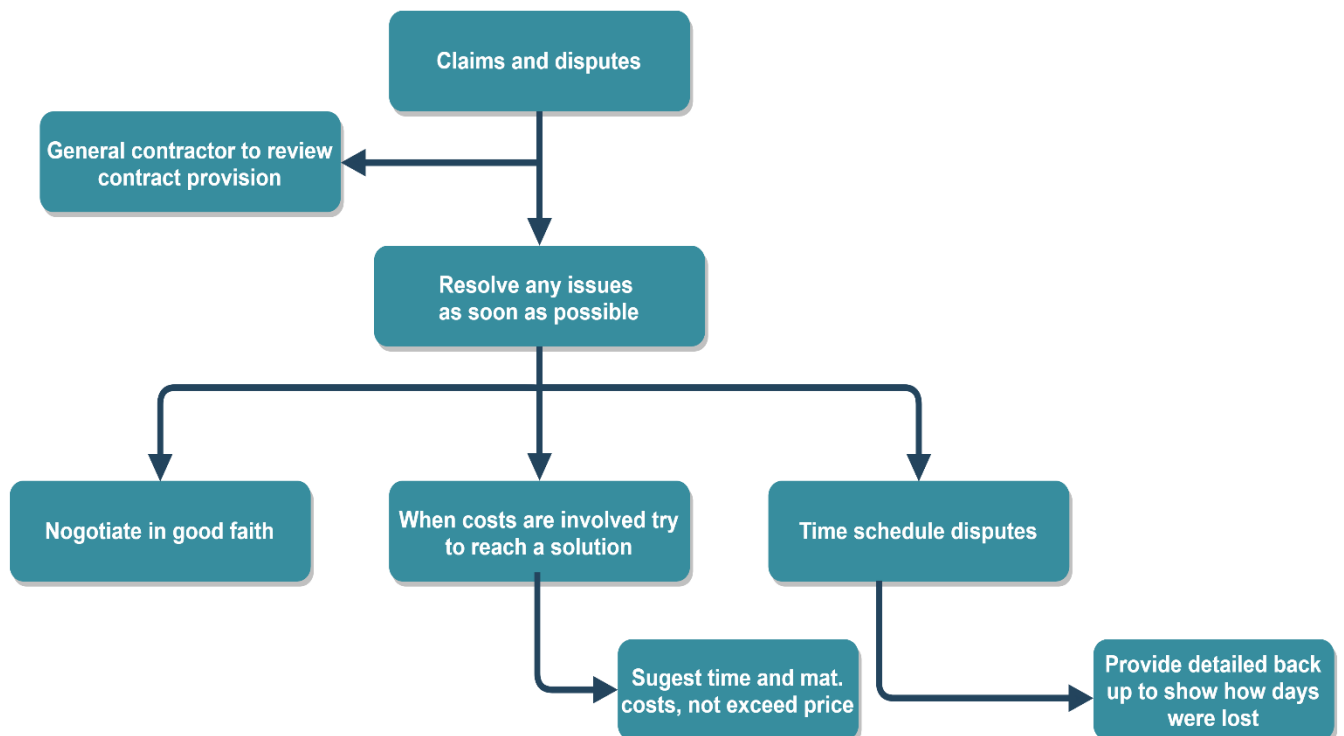
Changes in the project arise primarily for the following specific reasons, which are inspired by (Lambeck, Eschemuller 2009):

- 1) The project documentation provider is a team of people who can, for various reasons, commit mistakes, so that some items in the project may be missing or vaguely defined. This causes the general contractor to make cost changes due to missing or incomplete information. From the client's position, the general contractor is fully responsible for the control of the project documentation and agrees to its accuracy.
- 2) The requested information could not be detected in time.
- 3) A construction contract has been violated.
- 4) The contractor may have a different interpretation of the contract than the investor.
- 5) The investor does not accept the cost of the change sheets.

- 6) The construction site status differs from the situation described in the project documentation.
- 7) Changes are made to an already approved plan.
- 8) Construction needs to be accelerated and thus costs increase.
- 9) Substitution of materials without the consent of the investor.
- 10) The municipality asks for changes that lead to the creation of supplier's change sheets. The Contracting Authority leaves negotiations for changes from the municipality to the general contractor.
- 11) During construction, accidents can be affected by the timing and hence cost increases.
- 12) There is a shortage of construction materials for the project on the market, or the suppliers with the required qualifications do not have sufficient capacity to meet the obligations.
- 13) There are jurisdictional disputes between union trades.
- 14) Additional safety requirements are required after the project is started.

In the flowchart (Figure 12), it is shown the possible right way how to deal with possible claim situations. The best way to resolve the dispute is the agreement of the parties. Litigation settlement should only be considered as a last resort.

Figure 12 Flow chart of claims and disputes



Author, inspired: (Lambeck, Eschemuller 2009)

5.4 Parts of the Project with the Greatest Potential to Arise Claims

Some parts of the construction process are more susceptible to claims than others usually because of the ambiguity of these potentially problematic areas. Chapters 5.4.1, 5.4.2, 5.4.3, and 5.4.4 show and describe and several key areas that have to be deal with to minimize claim situations.

5.4.1 Project Documentation

Construction documents shall involve all drawings, specifications, appendices, sketches, and bulletins that receive the general contractor for the purpose of execution of the project. The interpretation of construction documents is a source of primary disputes which, in the case of EPC projects, arise between the general contractor and its supplier of project documentation unless it makes construction documentation by itself. It is essential that a thorough inspection of all construction documents is carried out as soon as it is received. (Lambeck, Eschemuller 2009)

Upon completion of the check of construction documentation, the design team is requested for the answer of relevant questions in a timely manner. The general contractor should be aware of the fact that they have purchased building documents and are co-responsible for not found mistakes. The "Silent" approach of the contractor is not recommended and can lead to costly disputes and possibly higher costs (removal of the product and/or equipment). Thorough control at the beginning of the process will not identify all potential problem areas, but it will help minimize potential misunderstandings and hence future claims. (Sears, Clough, Sears 2008)

5.4.2 Foundation Condition of Construction

The problematics of subsurface information and foundations of buildings is one of the most common areas with the great potential to the creation of changes of scope of works and arising of claims. It is because there is a big problem with getting quality and all-around information of soil condition on a building site.

All-showing survey to find out any possible variations in the foundation conditions would be nonsensically expensive, so there are frequent changes in the method foundation of buildings. The actual foundation conditions can be markedly different from those found in the building site during the start of works. These conditions can be entirely different because they are detected only by few soil pits. (Sears, Clough, Sears 2008)

In order of these problems, the way how to deal with unexpectable foundation condition must be stated in the contract or the contract terms. It may happen, when there is no mention of this problematics, that individual responsibility could fall to the general contractor. When different foundation conditions are found, besides informing the owner, it is also needed to prepare an estimate of costs to indicate how the costs would be met with new foundation conditions.

Furthermore, the updated time schedule should be arranged to show prolongation caused by subsurface condition survey. The relevant an actual time schedule would specify the extra time needed to deal with changed conditions. (Lambeck, Eschemuller 2009)

5.4.3 Change Orders

Modifications to the contract, which include the change of time or costs of a project, are formally documented by change orders. These modifications could change the contract (scope of works, schedule, original costs) by adding, deleting, or editing the work. They may be initiated by the owner, contractor or designer. The amount of the change is negotiated by the parties based on the contract. The procedure of processing change orders is very time-consuming for the general contractor. All change orders must be printed due to their contractual nature. (Sears, Clough, Sears 2008)

The approval of verbal requests for future change orders is unacceptable. In order the right submits costs of the change order, there must be stated a description with the drawings, sketches, and specifications. It is necessary to include to the change ordered the direct and indirect costs that should contain the price of general conditions, bonding, fee, insurance, security service, transport. It is typical that disputes usually come out because of cost and time schedule delays related to the request for change.

Therefore, it is essential to provide as much detail as possible. In the same way as the site conditions, if a change in order causes a delay, it must be included in the time schedule, which will be necessary for the total cost.

It is necessary to get signed for all cost submittals of change orders by the owner or his authorized representative. If it is not possible to get a total agreement with the change order, it is at least good to try to negotiate the approval for some part of changes. Uncompleted approve of the change order is better than none, but negotiations have to continue until the final change order is signed. Although, it is good to know that the bargaining power of the general contractor decreases when the project ends. (CIOB 2014)

5.4.4 Project/Construction Delays

Every severe delay of the project should be noted in writing form including a modified time schedule. It is necessary that the project team update the time schedule throughout the project in the same way. Unexpected conditions as abnormal weather condition, strikes or material shortages should be directly given in to the time schedule, including written description. If the owner requirements cause the change plans or even delay time schedule, the owner must be notified immediately. The owner must submit and approve the new time schedule. In cases when the owner does not accept it, the contractor should get the appropriate reason for refusing. For complex projects where the critical path method (CPM) schedules are used, all changes should be reflected in the activities that are affected by them. It is important to note the impact on the critical path and all affected parties must be informed of these changes. All circumstances and their consequences must be logically considered in the change. In some cases, a person called a planning consultant is hired for this activity. (Lambeck, Eschemuller 2009)

5.5 Accelerated Projects and their Timetables

Accelerated works are usually requested by the owner because of earlier start using of the building/construction. For using of accelerated schedule requested by the owner is necessary to do a full cost analysis of this change and present it to the owner for the confirmation before starting of this change. In line with (Lambeck, Eschemuller 2009) the cost analysis of change should include the following features:

- Costs for overtime workers;
- Material expedition;
- The administrative costs of reviewing and evaluating the timetable and purchasing the material;
- Costs of subcontractors;
- Bonds and insurance costs that need to be added to increase costs;
- Charges associated with increased costs;
- Modifications to the general conditions costs;
- Costs related to the use of mechanical equipment for building site on an overtime basis;
- The duration of preparing of new accelerated time schedule. (The general contractor should check if it is practical to create accelerate time schedule according to the remaining time of the project.).

5.6 Specific Actions to Minimize Claim Situations

The contractor must do everything in his power to minimize the need to initiate the change procedure. However, it may happen that, whatever the details of the claim, the claim may occur. The following checklist, inspired by publication (Lambeck, Eschemuller 2009) can be used to minimize claims.

- 1) An overall inspection of all construction documents.
- 2) Get the explanation of all unclear items.
- 3) Continuous review of the approved time schedule.
- 4) Get approvals for all time schedules by the owner.
- 5) Ensure that all the equipment supplied to the owner and the finished works are included into the time schedule.
- 6) Make sure of fully understanding of any construction document language that requires the general contractor to comply with local code requirements (as opposed to what may be in the drawings).
- 7) Archive and keep all supervision reports.
- 8) Provide all supervision results in an easily read format.
- 9) Take photos of the progress of a project (with stamps).
- 10) Updating RFI protocols with requests and responses (and relevant data).
- 11) Ensure that daily logs are up-to-date and detailed.
- 12) Keep shop drawing logs ready for use. Ensure that proper approved data are recorded.
- 13) Archive written instruction and logs to the subcontractors.
- 14) Allow the bid leveling sheets ready for use with the sign-off by the subcontractors.
- 15) Have updated correspondence (and emails) addressed to the owner and developer with their answers.
- 16) Watch and keep all weather reports and especially when it seems that extraordinary weather conditions could happen.
- 17) Timesheets for all businesses must be up to date.

- 18) Archive all details of all change orders and signed documents assigned by the authorizing party of the owner or developer.
- 19) Pay attention to proper keeping of copies of all field memos and telephone conversations.
- 20) Perform all site survey and let them authorize by relevant consultants.
- 21) Archive all original and additional soil reports.
- 22) Study construction projects and situations of similar law cases.
- 23) Take a good look and know all the details of the contract.
- 24) Realize the security program with the person responsible for its implementation and monitoring.
- 25) Ensure that all correspondence, reports, logs, and schedules are handled correctly for easier access.
- 26) Supply associated leveling sheets for all subcontractors.
- 27) Be aware of the use of a mix of performance specifications and detailed specifications.
- 28) Store entirely confirmed requests and copies of checks of the owner.
- 29) Create a team concept of cooperation with the owner, architect, consultants and general contractor.
- 30) Prevent any opposing relationships with subcontractors, the design teams, and especially with the owner.
- 31) Before starting work, make sure that all project participants (owner, architect, consultants, and general contractor) took a survey of the site. All issues should be raised by the general contractor and followed by a written summary requesting the clarification of the points submitted.
- 32) Assign responsibilities and a specific timetable to distinguish all open items.

5.7 Claims and Dispute Resolution Methods

Most of the dispute resolutions solved by litigation take a long time. In the construction industry, primarily because of the dynamics of projects, it is common to use dispute resolutions that are faster and does not need classical court resolution, e.g., arbitration or mediation. These processes are much more efficient and exceptionally generally private.

Dealing with these alternative dispute resolution methods has to be adequately described in contracts which closes the general contractor and the owner or other contracting parties. For the purpose of the reducing judge resolutions of disputes, because these processes are so compelling, many courts have enacted processes that order parties to court-ordered arbitration or court-ordered mediation. However, due to the proper protection of the processes guaranteed by the courts, parties are entitled to proceed to litigation if they wish so. (Mincks, Johnston 2011)

Some areas of the building process are more sensitive to claims than others, usually due to the ambiguity of these potential problem areas. (Schleifer, Sullivan, Murdough 2014)

Chapters 5.7.1, 5.7.2, 5.7.3, 5.7.4, 5.7.5 and 5.7.6 briefly describes most used alternative dispute resolution methods. The chapter 5.7.7 presents the process of litigation.

5.7.1 Partnering

The purpose of this method of dispute resolution is that each contracting party chooses its representative who will be part of the dispute review team. This dispute review team that is folded of representatives of each contracting party assess the conditions of the dispute. Because all parties are involved in the current construction process, they should have good knowledge of the resolved dispute. The decisions reached by this committee are usually non-binding. Another factor that needs to be considered is that each party has its own opinion that can lead to a bias that may affect the recommended decision. Partnering is one of the most effective and fastest alternative dispute resolution methods. In most of the cases can be disputes resolved almost promptly. (Lambeck, Eschemuller 2009)

5.7.2 Checklist of Disputes

Each contracting party (e.g., general contractor and owner) chooses an external construction specialist to establish an expert team. These two experts then chose an external chairperson. The crew cooperate and create a checklist of disputes in concert. They then periodically meet, for example, once a month to control and resolve all emerging changes. The frequency of these meetings depends on the complexity of the project. These people are mostly chosen from specialists of the construction field, and so they have extensive experience in this field. Thanks to their knowledge and experiences, they understand solutions and impact of disputes for contracting parties. (CIOB 2014)

By regular meetings during the project, the expert team can effectively evaluate all available information and check the conditions on the site. The expert team is usually paid in order of contract. Decisions over a checklist are usually non-binding. The checklist of disputes is an effective remedy to resolve all disputes.

5.7.3 Mediation

This dispute resolution method is directed by mediator which is voted by contracting parties from the field of specialist of the construction field. The task of the mediator is not to make final decisions. His mission is to help contracting parties to find solutions to problems that are acceptable for both sides. The mediator does not know all circumstances and detail of the dispute, but this is often useful, primarily because of the duration of the dispute resolution. (CIOB 2014)

Each of the contracting parties prepares position papers, that describe the solving problem, for better mediator understating of dispute issues. This is a procedure where the mediator looks for answers for an understanding of the situation of each contracting party. The task of the mediator is to solve some of the disputes by the detailed negotiating. Mediation is not binding unless the Contracting Parties otherwise agree. Mediation can usually be completed in two to three days. In the case of huge projects with many problems, it may take a week or more, but that is unusual. (Lambeck, Eschemuller 2009)

5.7.4 Conciliation

This method of dispute resolution called conciliation is similar to mediation, but the conciliator has a more active function in this process than the mediator. The conciliator must have proper knowledge of laws and requirements of dispute resolutions. Conciliator presents his opinion on the circumstances surrounding the dispute. He attempts to convince contracting parties of their views, and he will try to get the parties to an agreement that will be in line with the parties' rights and obligations under the contract. The conciliation is expected to be slightly shorter than mediation because the conciliator can focus the attention of parties on problems and manage the process in a way which the mediator could not use. Common conciliations could be finished in few days (even one or two days), but as with mediation, in sizable projects, the size of the number of problems grows proportionately, and solution of conciliation could last more than one week. (CIOB 2014)

5.7.5 Arbitration

The agreement of arbitration is usually part of standard civil engineering contract. Term arbitration means a private process where no one has the right to know about disputable matters or decisions expect if the contracting parties agree in a different way.

The decision of the arbitrator is definitive and binding and can be executed in many states under the New York Convention. Arbitrators, like judges, have to be independent and impartial. Every arbitrator must be objective and independent, as a judge. The person performing the profession of arbitration is usually selected specialists in the construction field. Arbitration works almost the same way as mediation, only the decision of the arbitrator is binding. The person executing an arbitration is ought to follow the rules of the contract and common laws, to provide a fast and sufficient solution to each problem given to jurisdiction. (Schleifer, Sullivan, Murdough 2014)

According to the arbitration agreement, the contracting parties could specify legislation which defines the responsibility of arbitrator in necessary procedures or follow other rules that are described in (CIOB 2014) as:

“The arbitrator's powers are set by a legal instrument. In the case of domestic disputes, it is common that it is the only arbitrator, but in international disputes, it is more common for each party to appoint its arbitrator and to appoint an arbitrator or arbitrator and create a three-member tribunal.”

The process of arbitration may last for a very long time and could be very expensive, according to the management skills of the arbitrator. It could be cheap and fast in ordinary situations of arbitrating. Usually, nothing can stop the one contracting party from altering its case and having to pay the costs of the other party. The arbitrator has the general jurisdiction of a judge to obtain evidence of proof of oath, surrender of evidence, discovery, et cetera. He is in powers to order the contracting party to pay the costs of the preliminary questions and may decide, who is ought to pay his fees, and whether, the party that loses has to pay the costs of the winning party partly or wholly, with or without interest and on what basis. The duty of the arbitrator is to state the reasons for his decision if one of the contracting party asks. (CIOB 2014)

5.7.6 Mini-trials

Dealing with disputes of the construction field is not always straightforward. It usually includes a lot of tasks and hundreds of documents. Therefore, disputes in construction projects could last a very long time, and they are also much costly. Accordingly, some construction managers and other industry executives who are contracting parties of construction contracts suggested the creation of a mini-trial process.

The mini-trial is a shortened procedure, that is usually carried out with the participation of the chief financial officers (CFO) of both disputing parties and their advocates. The mini-trial is based on the expectation that if the two CFOs listen, an advocate of the other party, the prevailing opinion will be agreed. In the process of mini-trial, each contracting party presents one reason why the dispute should be resolved in their favor. Advocates do a presentation of the legitimacy of the requirements, which runs as a monologue. Then each party summarizes the facts and CFOs settle their claims and reach an agreement, or the result of the dispute is decided by an independent person similar to the mediator. (CFMA 1988)

5.7.7 Litigation (Judge resolution)

Litigation is a method of dispute resolution governed by civil courts. In order with its huge-time consumption, it should be the last option for resolution of disputes. Generally, every person has the right to use this method for dispute resolution. One of the most severe disadvantages of this method is that judges usually do not have good technical knowledge. However, there exist some experts or courts specialized for the construction field litigations. Even though, there is a possibility for judges to consult problems with experts, that many parties require.

Although the court is in charge of state and the judge is an employee of the state, litigation is basically very costly method. Habitually, the reason for this is difficult rules of process, that can be often used by reluctant and slanderous parties to postpone the case of litigation for years when the case would amend to their benefit.

Litigation is a public procedure (justice must be considered and be done), and the public is instigating to participate in proceedings to learn about the issues at dispute. Judges must state the reasons for their judgment and the most important ones are published and noted in the law reports.

(CIOB 2014)

This method has to be excluded wherever possible. In case the other methods do not function, then this would, of course, be the last option. It should be noted that litigation has many disadvantages, some of them show (Lambeck, Eschemuller 2009) and are listed below.

- Huge pay-outs of lawyers and the costs of courts;
- The time required by the general contractor's personnel to be involved in discovery, depositions, and court procedures;
- The time that money may be tied up;
- Loss of potential interest on the money that is bound in a dispute;
- No guarantee of a positive outcome;
- The construction industry is a complex field, and judges should not have the technical ability to classify a dispute resolution truly.

5.8 Clauses Related to Damages

In cases, where the law could not offer a dispute resolution method that would secure and assure compensation of damages on the breach of a contract, the regulation of terms and conditions or contract regulations will allow the contracting parties to limit recoverable damages or remove some types of damages. Usually, the most common damage limitation clauses are termed “no damages for delay,” the waiver of consequential damages clause, and the liquidated damages clause. (Mincks, Johnston 2011)

5.8.1 No Damages for Delay

In this clause is contractor limited to extend schedule due to delays caused by the owner or delay caused by outside forces, that are also called force majeure. The contractor is not entitled to compensation for damages, only to the time schedule extension. In contracts with subcontractors, this clause limits subcontractors in the same clause where the general contractor caused the delay. These clauses are most effective in cases where the scope of work changes only a little for a relatively minor sum of money that can be caused because of owner-caused delay. It means that these clauses prevent from collecting damage prevents contractor for rational delays or types of owner-caused delays that are common in the project contracting. If the delay is the main or intentionally caused by the owner, the clause is not likely to be enforced.

For a case called "No damages for delay," the extension of the timetable is the only remedy under the contract for any delay caused by any reason or event. The Contractor acknowledges such an extension of time to his sole remedy under this Agreement and agrees to no claim for damages of any kind for delays caused by any act or omission of the owner. The conditions for non-price changes are usually stated in the contract or are negotiated between the parties. This clause is usually used for only small-scale changes. (Mincks, Johnston 2011)

5.8.2 Exceptions to the enforceability of No Damage for Delay Clause

Although most of the tribunals enforce these provisions, they tend to be strictly interpreted. The current solution is not always as simple as it seems and (Mincks, Johnston 2011) explain this situation in this way:

" Most courts begin with a presumption that these clauses are valid so long as they are clearly drafted. As noted above, however courts will generally construe no damages for delay class strictly, because they are exculpatory in nature and because the consequences of enforcement can be very severe. "

5.8.3 Waiver of Consequential Damages

This clause limits the contractor to a time extension in the event of owner-caused delay or delay form outside force such. The acknowledgment of this type of increasing duration of the project limits cannot cause claim for damages, because the cause of the claim situation is evoked by any activity or inactivity of the owner, which was directly related to the reason of the arising of a claim. (Mincks, Johnston 2011)

6 Case Studies in the scope of EPC/Turnkey Projects

Chapter 6 presents three problematic situations of dispute resolution of EPC projects. It is describing solving these cases. The particular case studies will show some disputes of company Fluor which is one of the world's largest company in the field of engineering and construction. The company provides services in these areas: oil and gas, industrial and infrastructure, and power plants of public and private projects.

This part of thesis present and describe the way of solving and developing dispute resolution of company's cases. The analysis of each case will try to find the best alternative solution to this situation. It will describe the way how to solve it in context with the description of the problems solved in the previous parts of the thesis.

6.1 Brief description of Fluor Corporation

The company provides services in these areas: oil and gas, industrial and infrastructure, and power for public and private owners. Fluor was established in 1912 in California. Initially, it works in only oil, the gas industry, and coal and iron ore mining, but over the years diversified its activities into the construction management and then it became the core business of the company. Since 1990, the company has also been engaged in activities such as equipment rentals and staffing or nuclear waste clean-up projects and other environmental work. The company has participated in projects directly related to Manhattan Project, reconstruction after the Iraq War, recovering from Hurricane Katrina and constructing the Trans-Alaska Pipeline System. (Fluor annual report 2017)

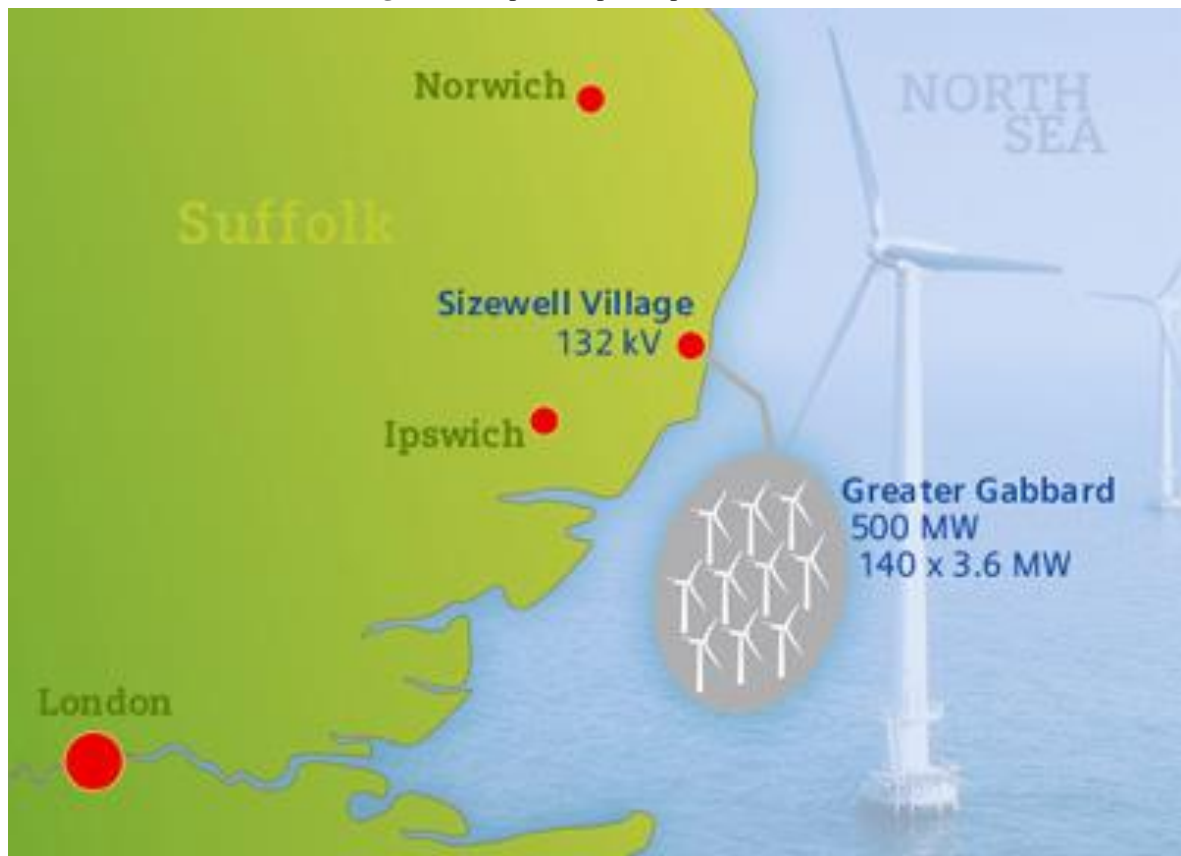
Fluor provides project using a delivery method that includes **engineering, procurement, fabrication, construction and maintenance** (EPFCM) companies, providing innovative and integrated solutions to government and private sector for clients in diverse industries. In addition to the EPCM, as discussed in Chapter 4.8, the company creates additional added value. Labels its projects as EPCFM where “F” is the designation for the fabrication. Thus, the company also makes its own fabricates for using on, not only theirs, construction projects. (Fluor annual report 2017)

6.2 The First Case Study: Fluor versus ZPMC

6.2.1 Basic Information about the First Case Study

The cause of this dispute is the quality of delivered constructions that include fabrication of steel monopiles for an offshore wind farm in south-eastern England (Figure 13 **Map of the power plant's location**). The claimant is company Fluor (mentioned above), and the defendant is company ZPMC (Shanghai Zhenhua Port Machinery Company) with activity focused on heavy-duty equipment manufacturer, in particular, ship to shore container cranes. (Case No: HT-2014-000190 2018)

Figure 13 Map of the power plant's location



(Siemens 2009)

6.2.1.1 Greater Gabbard offshore wind farm

The Greater Gabbard project was done at the cost of about \$1.05m (20.1m CZK). These costs do not include the grid connection. The powerplant can produce up to 1,900kWh every year, that is enough for power supply of 530,000 homes. Like any wind turbine, of course, it reduces the proportion of emitted carbon oxides into the air by million tonnes per year. (SSSE.com 2018)

Figure 14 Greater Gabbard offshore wind farm



(www.power-technology.com 2016)

On the beginning, the project was developed by Greater Gabbard Offshore Winds Limited, which closed a joint venture among companies Fluor and Airtricity. Fluor has contracted parts including design, supply, installation, and commissioning of the plant.

6.2.2 Description of Problematics of the Case Study

This case study deals with a dispute on a vast project which includes the performance of fourteen dozen wind power plants for the public owner (Greater Gabbard Offshore Winds Limited - GGOWL). One of the suppliers, which will play a significant role in this study, is named (Shanghai Zhenhua Port Machinery Company – ZPMC). The general contractor of the project is (Fluor). The subject of the contract with ZPMC and Fluor is to deliver steel parts of turbines for power plants.

The specific part of the structure for arising of this dispute was bad fabricated steel monopile and transition pieces. After the delivery of these parts, it turned out to be poorly fabricated, and the welds of many of parts were cracking or would crack in the future. This poor-quality delivery caused delays of works on this part of the structure and therefore the delay of the whole project. These obstruct caused the extent duration of the project and a proportional increase of an indirect cost that includes primarily costs for overheads. Therefore, Fluor requested

reimbursement of these “extra” overhead and other costs, that incurred because of prolongation of the construction period, at 4% of the original costs.

Company Fluor stated that at any time when a company expends a direct cost, it expends indirect costs throughout the project. The Fluor company has demanded that even further costs include overhead and profit, VAT, interest, and losses on currency conversion.

Under judge decision, Fluor was not quite right, and the court describes the situation as follows:

“Although a claim for overhead and profit had been mentioned, in neither the Re-Amended Particulars of Claim nor its Closing Note did Fluor put forward a figure for this or identify the heads of claim or items to which either overhead or profit should be added. VAT and interest were left to be dealt with (if not agreed) as consequential matters in the usual way. A claim in respect of currency conversion had been adumbrated by Fluor, but no particulars of that claim had been given.” (Case No: HT-2014-000190 2018).

Figure 15 Greater Gabbard offshore wind farm 2



(Geplus 2010)

ZPMC comment the claim situation and relying on the *Emden's Construction Law* that says:

It is possible to claim overheads in this type of situations, but Fluor could not do it here. The contractor has to prove that, if there were no breach of contract, his employees would otherwise be engaged for other work activities, thereby contributing to fixed overheads (such as head office costs). Also, the loss of the possibility of repayment of this contribution to its overheads may be a legitimate claim.

To win the dispute, the contractor must prove that he would have been able to do another job, or that other jobs would have effectively employed his labor. The contractor may request reimbursement of the cost of extending the rental of the site facility by proving of using it elsewhere. To obtain a claim for extra overhead costs. The contractor has to show that could use on other projects or rent it. He must specify and prove „*any depreciation of the plant which has resulted from the intensified or prolonged use*” otherwise the claim could be reduced.

Which means, if the subcontractor's lags will cause a delay in the completion of an additional three months, the contractor may claim the overhead costs for an extended duration of the project. This will be valid only if he can prove that he could move his workforce during a delay to another profitable work.

ZPMC did not accept this description of lost profits for other activities and also judge added that he does not agree with these statements based on Emden's law. He describes that head office overheads of Fluor were not extended only because of this project for its duration. For this situation showed this example: “*assume a contractor employed six accountants, whose activities concerned the administration of the business generally and were not project related.*”.

Fluor has not dealt with these conclusions during the litigation. In continuation of the process, it still claimed 4% of the original costs as compensation for the damage caused by the delay. In the year 2009, the cost of Fluor on this project was £374.735m. That is almost 57% of all activities of the company for the whole year. Sum of all overheads for that year was approximately £22m. Overheads for the project of GGOW was 57% or £12.645m.

Fluor, according to continuous judicial opinions, has to identify the amounts its claims as compensation for overheads. The court's request was to determine the increase of the specific items of budget mentioned in the dispute. The judge then gave the company ZPMC an opportunity to comment on Fluor's calculations.

The judge than presented these facts: Fluor got more money as compensation for certain infrastructure project-specific overheads in the amount of £1.3m, and total overheads were

therefore £14m. The amount of £14m is nearly 4% of £374.735m. The judge did not want to admit this fact.

The 4% value was a cost-to-cost ratio that did not show anything about the extent of the increase in spending due to a breach of contract by the ZPMC. While the judge assumed that Fluor could cause increased overheads due to a breach of contract by the ZPMC, he was not prepared to „To pluck a figure out of the air” (*Case No: HT-2014-000190* 2018).

The claim after lengthy litigation in 2018 almost after nine years failed.

(*Dispatch 212* 2018)

6.2.3 Summary of the Dispute

Finally, it is listed here a quick overview of what the solution to the dispute was all about.

- Fluor was the general contractor of owner GGOWL, one of their subcontractors for steel was called construction of turbines, ZPMC.
- Supplier ZPMC delivered terrible quality products.
- It has delayed project works.
- The Fluor company claimed for this delay compensation for the overheads and other costs.
- ZPMC refused to do so, and the entire case began to be dealt with in court.
- Fluor specified this claimed amount of money as a ration 4% of all project overheads.
- The judge did not want to accept the claimed amount of money stated only on this ratio.
- Another explanation of the price was not accepted for its poor explanatory power.
- All process of judge resolution lasts almost nine years until a final court decision was reached.
- The opinion of the judge was dissenting. Fluor failed the litigation.

6.2.4 Recommendations to Prevent

The most straightforward way of preventing these types of disputes is choosing of the proven supplier. This contractual partner should have previous experience with similar works. It is preferred to cooperate with subcontractors, with whom, the general contractor has a previous positive experience. Another method to ensure the delivery of good quality products is to inspect the quality lists by a certified person.

A good way how to prevent disputes raised from lack of a contract is to study the contracts and law conditions of similar projects. If the company would like to reimburse costs for overheads or lost profits, as in this case, it is necessary to secure these things in relevant paragraphs of a contract.

6.2.5 The Conclusion of the First Case, Fluor versus ZPMC

Fluor company has made much effort and financial resources to win the litigation. However, the company Fluor lost the dispute. The judge resolution lasted almost nine years (from 2009 to 2018), and the claims of the company were rejected.

If the parties had agreed to a lower amount for incurred damages, or the Fluor had used the better-backed data, the Fluor company could have won the court case. Also, if a lower amount is claimed, the entire court process would not have to go through the company and pay for it.

Assumptions that have been stated in previous chapters has been confirmed; the litigation is not the best way how to solve disputes. In order of judicial resolution of dispute situations mainly due to the length of the process, the dispute resolution should be wholly avoided and chose an alternative way of dispute resolution or resolve the dispute by negotiating.

6.3 The Second Case Study: Fluor versus GGOWL

6.3.1 Brief Introduction of GGOWL

Greater Gabbard Offshore Winds Ltd (GGOWL) is the company that was established due to developing, constructing, and operating of the offshore wind farm in southeast of England. The GGOWL and obviously project of the power plant were developed of a partnership between companies RWE Innogy and SSE.

6.3.2 Description of Problematics of the Case Study

This case study deals with the dispute of the company Fluor and Greater Gabbard Offshore Winds Limited (GGOWL) on the same project as in the first case study.

The disagreement between parties above arises from the fact that the Greater Gabbard Offshore Winds has demanded Fluor, the general contractor of a wind turbine farm project, to refurbish and future more do tests of its turbines.

The additional works, which were not necessary to do (in the opinion of general contractor), has caused extra costs for Fluor and has extended the duration of their activities in the most exposed phase of the project. The company, therefore, demanded compensation of £ 300 million (\$ 477 million). The GGOWL was reluctant to pay this amount.

David Seaton, that date chairman and CEO of Fluor made the following statement of this case: *“Fluor delivered a quality project, and we are extremely disappointed with this unexpected decision, especially considering recent statements that acknowledge that all 140 turbines are commissioned and exporting electricity, and the overall performance is more than 10 percent ahead of the client’s expectations,”* (Newsroom Fluor 2010).

Nevertheless, the company can go back and ask for an amount that would potentially exceed Fluor's claim, as confirmed by Paul Coffey, responsible person of GGOWL.

“We have installed monitoring equipment on the structures that we believe are defective to ensure they are only run to the extent it is safe to do so. All 140 foundations and 140 turbines are installed, with more than 125 generating power including some on defective structures”, he said.

He also comments the case and says, that resolving the dispute would likely take the form of formal arbitration. Fluor expected that Greater Gabbard Offshore Winds' counter-proposal would be taking part in the same year when Fluor required extra payments. (*Windpower* 2009)

The dispute was closed by agreement or arbitration between mentioned parties. Unfortunately, the details and the exact result of the company's negotiations were not published. GGOWL general manager explained the situation by statement listed below.

Iwan Tukalo, General Manager at GGOWL, commented conclusion of the situation:

“The agreement between GGOWL and Fluor is a positive development, bringing to an end the contractual dispute between the two parties. It is also encouraging that the wind farm has performed well since it was energised, and our focus remains on ensuring it is a safe, efficient asset that makes a significant contribution to achieving the UK’s targets for renewable energy.”.

(Offshorewind 2012)

The dispute was solved in the same year when began without using litigation as a method of resolution.

6.3.3 Summary of the Dispute

- At the end of the project, doubts about the quality of the monopiles carried out by GGOWL.
- During the year 2011, GGOWL decided to carry out Fluor's tests to check monopiles with which Fluor did not entirely agree.
- After testing, it was found out that 52 of the 140 were defective.
- These tests have disrupted the time plan, and Fluor requested and £300 million as compensation.
- However, this amount was not paid to Fluor, but both parties reached an agreement. Details of the settlement were not disclosed.
- The dispute was solved in the same year when it began without using litigation as a method of resolution.

6.3.4 Recommendations to prevent

One option of the preventing this situation could be the formulation of accurate control and test plan by contracting parties. The test plan prevents the unexpected testing that could cause prolongation of a project. The statements define testing should be adequately characterized in the contract.

Another way to avoid this situation is to do the work so that the owner would not have reason to request an extra test of constructions.

In conflicts, where the primary task is the quality of the work done, it is necessary to properly document the construction tests in order to have no owner's doubts about the quality.

6.3.5 The Conclusion of the Second Case, Fluor versus GGOWL

Despite the considerable complexity and significant financial commitments, the case was solved quite easily. This example has shown that if alternative dispute resolution is used to resolve the problem, and the conflict is not solved through a court procedure, it can be concluded relatively quickly and without much financial difficulty.

For these disputes, it is essential to solving them quickly. Considering, the companies could direct their efforts to other projects and problems. Long-term judicial resolutions are not just a wasting of time and money to pay direct costs bounded with litigation. Moreover, the company loses opportunities to engage employees on other projects, because they are busy resolving the issues of litigation.

6.4 The Third Case Study: Fluor versus Westinghouse

6.4.1 Brief Introduction of Westinghouse Electric Company

Westinghouse Electric Company is an American nuclear power company founded in 1998 by the Westinghouse Electric Nuclear Power Division. The original Westinghouse was founded in 1886, but it was restructured at the end of the 1990s. Its primary business is the construction of nuclear power plants and the supply of nuclear fuel. Interestingly, Westinghouse was a fuel supplier for the NPP Temelín till the year 2010.

Figure 16 MGN, Georgia Powerplant



(media.graytvinc 2010)

6.4.2 Basic Information about the Third Case Study

The Fluor company was a subcontractor of Westinghouse at many projects of construction or refurbishment of nuclear power plants across the US. Fluor company has much experience with the nuclear power industry because it has been doing it for over 70 years.

The dispute of these contracting parties arose after the bankruptcy of the original companies of the Westinghouse corporation company and the restructuring of these enterprises.

6.4.3 Description of Problematics of the Case Study

In this court process, the claimant was company Fluor, and demandant was Westinghouse company. Fluor required \$262 million for creditor claims because the general contractor of the nuclear project (Westinghouse) has unpaid him work costs resulting from canceled contracts. To resolve creditor claims, Westinghouse said the global engineering and construction firm Fluor had greatly exaggerated what should be allowed to withdraw from the bankruptcy estate.

The essence of the dispute emanates from contracts of subcontracts between the two parties where Westinghouse has concluded agreements with Fluor for assistance in nuclear reactor projects at the Alvin W. Vogtle Electric power plant near Augusta in Georgia and the Virgil C summer nuclear power plant near Columbia, South Carolina. The construction of these nuclear power plants has become technological advances and the first modern projects of this type in the US, Since the 1970s.

In connection with the massive overrun and years of delays, Westinghouse was forced to file a bankruptcy petition. The owner of the V.C. Summer power plant has therefore decided to cancel the power plant contract with Westinghouse and hired another company to complete the project. Despite these facts, Westinghouse and Fluor continued their work a few months after Westinghouse declined. Fluor received more than \$750 million for its work.

(*Law360*, 2018)

Westinghouse now declare that its subcontractor is attempting to parlay a general unsecured claim as it written in (*Law360*, 2018) “*claim for approximately \$60 million worth of prepetition work into a claim of \$337 million based on a purported to right to terminate the underlying agreements and collect additional monies under the contract terms.*”

Fluor calls for these "termination payments" on the basis of unpaid pending charges, for which he did not have a guarantee. The counsel of Westinghouse said: "*Fluor's claim is limited to amounts actually earned prepetition. Any recovery or liability more than that amount is expressly barred.*“ (*Law360*, 2018) Despite these objections, the Fluor company was still behind its claim.

Westinghouse landed in bankruptcy in March 2017. The parent Toshiba Corp. announced that the unit would have booked \$ 6.1 billion to exceed the cost of its constructions of two nuclear reactor sites in the US. (*Law360*, 2018)

The whole process began to be resolved in litigation. Due to the lack of evidence that the claims of Fluor are justified in the bankruptcy process, the claim was rejected.

6.4.4 Summary of the Dispute

- Fluor has been a subcontractor for Westinghouse on many nuclear power plants across the US.
- Fluor has attacked Westinghouse because of its unpaid labor costs resulting from canceled contracts.
- Since the firm on which the creditor claim was bounded was in bankruptcy, it had no other option and started the Fluor Litigation.
- The Fluor claimed \$ 262 million as compensation.
- A total of \$ 262 million seemed to Westinghouse to be exaggerated.
- Due to the lack of evidence that the claims of Fluor are justified, the claim was rejected.

6.4.5 Recommendations to Prevent

The best way how to solve these types of cases is to prevent their creation, but this solution is not possible to do every time. This resolution is not always feasible mainly because of lack of time and vast complexity of construction projects.

The convenient approach of solving is to avoid work with companies that are not in good condition or threaten to bankrupt. The contract must resolve the possibility of the bankruptcy of the owner. Close attention must be paid to checking and as well requiring timely payments from the owner.

6.4.6 The Conclusion of the Third Case, Fluor versus Westinghouse

The unexpected bankruptcy situation of the company of this size is hard to hide. If there are some hints of insolvency, it is necessary to do activities to prevent harmful impacts or to mitigate future adverse impacts. Waiting without interference that the dispute will be solved somehow is not appropriate.

However, it is difficult to avoid the comparable situation with a contracting party that is in danger of bankruptcy. This was the case of the company's bankruptcy that was otherwise stable, and it was hard to predict that this would happen.

7 Conclusions of Thesis

This master thesis was dealing with the theoretical background of claim management in the construction industry. The greatest attention was paid to EPC/turnkey projects. Explained methods of dealing with claim situations concluded how to standardize these process in construction or project management companies. The issues of the claim management were defined by related literature. However, these issues are still evolving. Therefore, it is necessary to use the knowledge of nowadays disputes or own know-how in dispute resolution.

7.1 Conclusions and Summary of Chapters

The first chapter described the aim and delimitation of the thesis. The second chapter briefly characterized individual persons involved in the construction process (stakeholders), their required abilities and qualifications, and other essential terms used in the thesis.

The entire life cycle of the project with emphasis on solving the claim situations in the individual phases was defined in chapter three. There were shortly presented phases of the projects from the Pre-bid to the Contract competition.

The fourth chapter was dedicated to the most used delivery methods in the construction industry. The research provided an understanding of how the system of the EPC/turnkey works and its main advantages and disadvantages. For comparison, further delivery methods were mentioned.

The fifth part was focused on the claim management. There were gradually described basic terms of claim management: reasons why claim arise, their analysis in the line of used literature, parts of projects with the highest potential to arise claims, accelerated projects, specific actions to minimize claim situations and methods of dispute resolution. The sixth chapter was aimed at three case studies of real construction projects.

7.2 Conclusions of Case Studies

The sixth chapter analyzed specific case studies that were afterward evaluated in order with knowledge of previous chapters. The analysis of each case study contained a description of the whole problem area, the description of the case and its problematics and in the final chapters (6.2.4, 6.2.5, 6.3.4, 6.3.5, 6.4.5 and 6.4.6) were stated recommendations for preventing and conclusions. The case studies presented and agreed assumptions that were stated in the initial part of the thesis. Results of case studies were primarily inspired by chapters 3 and 5 of this thesis and conclusions professional journals or court cases.

7.2.1 The Conclusion of the First case study, Fluor versus ZPMC

The dispute of the case study arose from the poor quality of delivered products by the subcontractor to the general contractor. As it was written in the previous chapters, the most straightforward way of preventing these types of disputes is choosing of the proven supplier. This contractual partner should have previous experience with similar works. It is preferred to cooperate with subcontractors, with whom, the general contractor has a previous positive experience. Another method to ensure the delivery of good quality products is to inspect the quality lists by a certified person. A good way how to prevent disputes raised from lack of a contract is to study the contracts and law conditions of similar projects. If the company would like to reimburse costs for overheads or lost profits, as in this case, it is necessary to secure these things in relevant paragraphs of a contract.

Fluor company has made much effort and financial resources to win the litigation. However, the company Fluor lost the dispute. The judge resolution lasted almost nine years (from 2009 to 2018), and the claims of the company were rejected. If the parties had agreed to a lower amount for incurred damages, or the Fluor had used the better-backed data, the Fluor company could have won the court case.

7.2.2 The Conclusion of the Second case study, Fluor versus GGOWL

This case presented dispute resolution in the quality of delivered works. Parties of conflict were the owner GGOWL (as defendant) and the general contractor Fluor (as claimant). One option of the preventing this situation could be the formulation of accurate control and test plan by contracting parties. The test plan prevents the unexpected testing that could cause prolongation of a project. The statements define testing should be adequately characterized in the contract. Another way to avoid this situation is to do the work so that the owner would not have reason

to request an extra test of constructions. In conflicts, where the primary task is the quality of the work done, it is necessary to properly document the construction tests in order to have no owner's doubts about the quality.

Despite the considerable complexity and significant financial commitments, the case was solved quite easily. This example has shown that if alternative dispute resolution is used to resolve the problem, and the conflict is not solved through a court procedure, it can be concluded relatively quickly and without much financial difficulty.

For these disputes, it is essential to solving them quickly. Considering, the companies could direct their efforts to other projects and problems. Long-term judicial resolutions are not just a wasting of time and money to pay direct costs bounded with litigation. Moreover, the company loses opportunities to engage employees on other projects, because they are busy resolving the issues of litigation.

7.2.3 The Conclusion of the Third case study, Fluor versus Westinghouse

The dispute between general contractor Fluor and owner Westinghouse was caused primarily by the bankruptcy of the owner. Recommendations of the third case were presented in 6.4.5, and they are described as follows.

The best way how to solve these types of cases is to prevent their creation, but this solution is not possible to do every time. This resolution is not always feasible mainly because of lack of time and vast complexity of construction projects. The conventional approach of solving is to avoid work with companies that are not in good condition or threaten to bankrupt. The contract must resolve the possibility of the bankruptcy of the owner. Close attention must be paid to checking and as well requiring timely payments from the owner.

The unexpected bankruptcy situation of the company of this size is hard to hide. If there are some hints of insolvency, it is necessary to do activities to prevent harmful impacts or to mitigate future adverse impacts. Waiting without interference that the dispute will be solved somehow is not appropriate. However, it is difficult to avoid the comparable situation with a contracting party that is in danger of bankruptcy. It was the case of the company's bankruptcy that was otherwise stable, and it was hard to predict that this would happen.

7.3 General Conclusions, Proposals to Proceed

The most important conclusion of this thesis, which appears throughout the chapters, is that the best resolution of disputes is negotiating. In cases where negotiating fails, it is desirable to use some alternative dispute resolution method described in chapters 5.7 and 5.8. The very last option for solving disputes should be the litigation, mainly because of its high time and financial difficulty.

In the initial part, there were formulated research questions (chapter 1.3). Within the thesis, all the research questions were answered using a theoretical description of the solution based on the studied literature (see chapters 2, 3, 4 and 5) and the analysis of real dispute resolutions (see chapter 6).

The first case proved that the litigation is the worst dispute resolution. The entire process lasted almost nine years, and the claimant (Fluor company) did not win the court case. Moreover it lost plenty of money and time.

The second case study presented claim situation between the general contractor (Fluor company) and the owner (GGOWL) which primary arose due to the poor quality of works and bad test plan. The dispute resolution lasted less than one year because it was used an alternative method of dispute resolution.

The third case focused on the situation where the owner bankrupted. In such cases, it is usually the only solution the litigation. Company Fluor lost the court case. It was probably because of the overestimation requirements of the claim. Otherwise, well-functioning companies could easily bankrupt due to the combination of several circumstances, and therefore it is difficult to avoid cooperation with them.

The analysis of the claim management does not finish with the end of this thesis. This work gives incentives for further study to a broader extent than it was described on these pages. As well as there are not existing two same projects, there are no two same claims or disputes. Therefore each case must be evaluated individually, and it must be solved according to all appropriate circumstances. In literature or practice, we can find many examples of other disputes and learn from their solutions to find the answer to our disputes. As it has been said at the beginning, with each relationship, whether contractual or not, the disputes arise, and these cases need to be solved.

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List of Abbreviations

CEO	Chief efficient officer
CFO	Chief financial officer
CFMA	Construction Financial Management Association
CMAR	Construction management at Risk
DB	Design Build
DBB	Design Bid Build
EPC	Engineering Procurement Construction
EPCM	Engineering Procurement Construction manager
GGOWL	Greater Gabbard Offshore Winds Ltd.
IPD	Integrated Project Delivery
MPC	Multiple Prime Contractors
NPP	Nuclear power plant
PPP	Public-private partnership
US, USA	United States of America
RFI	Request for information
ZPMC	Shanghai Zhenhua Port Machinery Company