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## **Construction Contracts in Oil and Gas Projects**

عقود الإنشاءات في مشاريع النفط والغاز

**By**

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## Abstract

This research is an attempt to discuss construction contracts in oil and gas projects. It is focused on several types of construction contracts that are used in oil and gas industry. It outlines the different phases of an oil and gas project starting from concept, FEED and ending at EPC phase. The research discusses the FIDIC Silver Book which is used for EPC projects that are known as turnkey projects. Every project is experiencing risks of different levels. These risks need to be identified and managed to reduce their effect. Selecting the right contracting method helps in limiting risks the project might experience. Although UAE does not have a dedicated law for construction industry, it supports the freedom of contract principle. This means a bespoke contract, including a FIDIC contract, can be used by the contracting parties as long as its terms and conditions do not conflict with any of UAE mandatory rules. The change management is addressed in terms of variations and extension of time. Reasons causing variations and / or affecting the project schedule are addressed in this research along with the responsible party of these change orders. Moreover, the research discusses the risk allocation based on FIDIC Silver Book and highlights whether all risks are really shifted to the construction Contractor or some of them remain with the Employer. The end of the research discusses the dispute resolution mechanism adopted in FIDIC Silver Book and the mechanism adopted within UAE.

## ملخص

هذا البحث هو محاولة لمناقشة عقود البناء في مشاريع النفط والغاز. فهو يركز على أنواع عقود البناء المستخدمة في صناعة النفط و الغاز. كما أنه يحدد المراحل المختلفة في مشاريع النفط والغاز. يناقش البحث نوع العقود النموذجية التابعة لإتحاد المهندسين (FIDIC) و الذي يستخدم في مشاريع الهندسة والتطوير و البناء (EPC). كل مشروع يشهد مستويات مختلفة من المخاطر لذلك لابد من تحديد المخاطر و التمكن من الحد من تأثير هذه المخاطر. إختيار طريقة التعاقد الصحيحة يساعد في الحد من المخاطر التي قد تواجه المشروع. على الرغم من أن دولة الإمارات العربية المتحدة لا يوجد لديها قانون مخصص لصناعة البناء و التشييد إلا أنها تؤيد مبدأ حرية التعاقد. هذا يعني إن العقود المبرمة بما في ذلك عقود (FIDIC) يمكن إستخدامها من قبل أطراف التعاقد طالما إن الأحكام والشروط لا تتعارض مع أي من القواعد الإلزامية في دولة الإمارات العربية المتحدة. كما يناقش البحث أسباب التغيرات و تأثيرها على الجدول الزمني للمشروع مع تحديد الطرف المسؤول عن هذه التغيرات. و علاوةً على ذلك, يناقش البحث مبدأ توزيع المخاطر على أساس عقود (FIDIC) و يسلط الضوء على ما إذا كانت جميع المخاطر يتم تحويلها إلى مقاول البناء أو أن بعض منها يبقى مع صاحب العمل. في النهاية يناقش البحث آلية تسوية المنازعات على أساس عقود (FIDIC) و الآلية المعتمدة في دولة الإمارات العربية المتحدة.

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## Abbreviations & Definitions:

BOQ	:	Bill of Quantity
CTC	:	Civil Transaction Code
EPC	:	Engineering, Procurement & Construction
FEED	:	Front End Engineering Design
FIDIC	:	International Federation of Consulting Engineers
PMC	:	Project Management Consultancy
LOA	:	Letter of Assistance
UAE	:	United Arab Emirates

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## 1. Introduction:

A contract can be defined as an agreement with outlined terms and conditions amongst two or more parties in which there is the assurance to deliver the subject matter for a benefit referred to as remuneration.<sup>1</sup> Contracts protect the interests of the contracting parties in the event of any unpleasant circumstance. Contracts can be of many types covering any agreements between the parties. It can be sales contract, employment contract or construction contract. There are many factors that distinguish construction contracts from others. These factors are, among others, the length of the project, its complexity and its size.

According to John Uff “the essence of a construction contract is that a contractor agrees to supply work and materials for the erection of defined building or other works for the benefit of the employer. The detailed design of the work to be carried out is often supplied by or on behalf of the employer, but may also be supplied in whole or in part by the contractor. In legal terms there is no difference between a building and an engineering contract, and the term Construction Contract is adopted to cover both”.<sup>2</sup> Construction contracts are one of the most complicated contracts due to their nature and associated risks. All construction projects are subject to risks. A risk can be defined as the possibility of an event that can cause damage or loss. Different construction contracts may encounter risks of different types and / or levels. The FIDIC forms of contracts are useful in construction agreements that are used in the oil and gas projects. FIDIC is considered to bring balance in the interest of the contracting parties especially in the presence of obstacles. Oil and Gas contracts can be divided in to several types based on the contracting parties as well as on the types of the work to be executed.<sup>3</sup> This dissertation classifies the types of contracts on the basis of scope of work. The following types of contracts will be discussed in the dissertation:

- i. FEED and Detail Design contracts which are usually awarded to Consultant Firms.

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<sup>1</sup> JT Nashikar, 'Contract Management' (Academia.edu, 2016) [http://www.academia.edu/14057795/contract\\_system](http://www.academia.edu/14057795/contract_system) accessed 5 January 2016.

<sup>2</sup> John Uff, *Construction Law* (7<sup>th</sup> edn, Sweet & Maxwell 2013) 265.

<sup>3</sup> Toby Hewitt, 'Who Is To Blame? Allocating Liability In Upstream Project Contracts' (2008) 26 *Journal of Energy & Natural Resources Law*, 179.

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ii. EPC contracts which are awarded to EPC Contracting Organizations.

The dissertation will discuss different contractual approaches and look into which contract assures stability in relation to legal relations in the UAE. It is accepted that adopting the most suitable contract minimizes overall costs and enhances efficiency. Additionally, it guarantees that all contract services are tendered under similar terms and conditions. Complex construction projects and asset maintenance in the oil and gas industry are characterized by numerous high risks. These oil and gas projects are also characterized by complexity and capital intensity. In order to develop, sustain and operate these types of projects, governments usually depend on EPC contracts to successfully undertake them. The oil and gas industry is very risky and the risks vary based on different types of contracts used. The contracting method requires professionals to form and to choose agreements that are flexible to cater to project objectives and specific terms and conditions.

The primary objective of this paper is to discuss different construction contracts in the oil and gas industry as follows:

- i. To discuss EPC (Engineering Procurement and Construction) and FEED (Front End Engineering Design) and their influence on projects in the oil and gas industry.
- ii. To discuss the relationship of different contracts and their impact on performance of projects.

Usually there are no concerns when projects are progressing smoothly and payments are being made on time. Any minor contractual disputes are resolved and settled through negotiations and discussions. Conflict happens when issues divert from the normal and original plan. For example, delaying payments or slow progress may result in conflicts. These conflicts are manageable in case of well drafted construction contract. The conflicts are easy to resolve if the dispute clauses are written with sufficient details. According to Mohamed Shafik, there were not many concerns toward the contract's conditions in U.A.E. since contracts were prepared as a formality not as necessity.<sup>4</sup>

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<sup>4</sup> Mohamed Shafik, "UAE Construction Law: A UK Perspective On Payment And Liabilities" (Post graduate, University of Salford 2010)3.

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The dissertation will adopt a doctrinal method of research. This method is selected because doctrine method is the most used methodology in legal research. This method relates with interpretation of law and application of legal doctrines and scholarly commentaries. The dissertation will discuss various contracts in the oil and gas industry. It will also highlight different aspects of different types of contracts used for oil and gas projects and some possible associated risks.

The dissertation will be divided into four key chapters. The chapters are summarized as follows:

**Chapter One – An Overview of the Legal Framework for Construction in United Arab Emirates (U.A.E.)**

This chapter covers the legal system in UAE in relation to construction industry. It discusses U.A.E. CTC including its basis, principles, sources and construction related articles. It also covers a discussion of different types of FIDIC standard contracts that are used in U.A.E.

**Chapter Two – Types of Construction Contracts in Oil and Gas Industry**

Chapter two of this dissertation describes several types of construction contracts that are used for oil and gas projects. It touches on the different contracting methods adopted in oil and gas industry and principles considered in selecting the suitable type of contract. This chapter covers contracts suitable for different phases of the project. It discusses contracts required for the concept phase, the FEED & Detail Design phase and the EPC phase.

**Chapter Three – Change Orders**

Chapter three covers two aspects which lead to change orders i.e. variation and schedule & extension of time. It explains some reasons that will lead to issuance of change orders by the Employer. It discusses the causes of the variations and extension of time with specific reference to FIDIC Silver Book. Also, it covers a discussion on the responsible party of the change orders and their consequences.

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## **Chapter Four – Risks and Dispute Resolution**

This chapter addresses some possible risks that are associated with oil and gas projects. The chapter focuses on allocation of risks in accordance to FIDIC Silver Book and outlines a mechanism to control these risks. It also, covers contracts dispute clauses and resolution with respect to U.A.E. law and FIDIC Silver Book.

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## 2. Chapter One – An Overview of the Legal Framework for Construction in United Arab Emirates (U.A.E.)

### 2.1. U.A.E. Civil Transaction Code (CTC)

U.A.E. legal system is based on the Constitution of the U.A.E. 1971. Shari'ah and the civil law system are the main sources of legislation. Shari'ah is originated on concepts of equity and justice. The essential bases of Shari'ah are Koran and Sunna.<sup>5</sup>

The CTC lists the legislative provisions and the accepted sequence of precedent. In this context, article 1 of the CTC states that “The legislative provisions shall apply to all matters dealt with by those provisions in the letter and in the spirit. There shall be no scope for innovative reasoning in the case of provisions of definitive import. If the judge finds no provision in this Law, he must pass judgment according to the Islamic shari'ah. Provided that he must have regard to the choice of the most appropriate solution from the schools of Imam Malik and Imam Ahmad bin Hanbal, and if none is found there, then from the schools of Imam al-Shafi'i and Imam Abu Hanifa as dictated by expediency. If the judge does not find the solution there, then he must render judgment in accordance with custom, but provided that the custom is not in conflict with public order or morals, and if a custom is particular to a given emirate, then the effect of it will apply to that emirate”.<sup>6</sup>

Whereas, article 2 of the CTC provides that “The rules and principles of Islamic jurisprudence (fiqh) shall be relied upon in the understanding, construction and interpretation of these provisions”.<sup>7</sup> Examples of such principles are listed below:

- The principle of permissibility (Ibahah),
- The principle of bringing ease (Tayseer)
- The principle of removing hardship (Raf' al-haraj),
- The principle of freedom of contract (Hurriyyat al-ta'aqud),
- The principle of good faith (Husen al-nayeah), the principle of ratiocination (Ta'lil),
- The principle of sanctity of contract (Alwafaa bel-ohood).<sup>8</sup>

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<sup>5</sup> Uk.practicallaw.com, "Practical Law" (2016) <http://uk.practicallaw.com/4-501-9686#> accessed 22 February 2016.

<sup>6</sup> CTC Book one, Ch. Part 1 (General Provisions) s. 1 Art 1

<sup>7</sup> CTC Book one, Ch. Part 1 (General Provisions) s. 1 Art 2

<sup>8</sup> Prof. Aymen Masadeh, "Construction Law In UAE" (British University in Dubai, 2014).

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- The CTC is built up based on different sources of law that form the code and put together in certain sequence. In reference to the UAE CTC, the primary sources of the law are:
    1. Legislation.
    2. If there is no legislation or the legislation is silent on a certain issue,
      - Reference shall be made to the Schools of Imam Malik and Imam Ahmad Bin Hanbal.
      - If none, reference shall be made to other schools and the general principles of shari'ah.
    3. Custom provided that it does not clash with public order.<sup>9</sup>

The CTC of U.A.E. comprises of Legislation, Islamic Principle, Custom and Equity. The Civil law is written by legislators and codified in the CTC. In U.A.E., it is not role of the judges to create the law. The judges have the responsibility of interpretation and implementation of the law. In U.A.E. CTC, the judicial precedent is considered a secondary source of the code. This means that the judge is not bound by decisions made on preceding law cases that have similar merits.<sup>10</sup>

In U.A.E. there is an important principle in contracting and that is the Freedom of Contract (Party Autonomy). It is worth mentioning that Construction law is not considered a branch of law similar to criminal law.<sup>11</sup> There is no dedicated law in U.A.E. directed to the construction industry.<sup>12</sup> Rules related to construction can mainly be found in Articles 872 – 896 of U.A.E. federal law No. 5 of 1985 under the CTC. There are numbers of local laws and bylaws that supplement the construction rules under the CTC. Most of these local laws are concerned with governmental construction contracts. In U.A.E., governmental construction contracts are governed by the CTC and this might not be the case under other jurisdictions.

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<sup>9</sup> Prof. Aymen Masadeh, "Construction Law In UAE" (British University in Dubai, 2013).

<sup>10</sup> Uk.practicallaw.com, "Practical Law" (2016) <http://uk.practicallaw.com/4-501-9686#> accessed 22 February 2016.

<sup>11</sup> Mohamed Shafik, "UAE Construction Law: A UK Perspective On Payment And Liabilities" (Post graduate, University of Salford 2010)7.

<sup>12</sup> Mohamed Shafik, "UAE Construction Law: A UK Perspective On Payment And Liabilities" (Post graduate, University of Salford 2010)10.

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The rules of construction under the CTC cover four (4) sections as follows:

- i) Section One: Definition and scope of muqawala
- ii) Section Two: Effects of muqawala
  - Obligations of the contractor
  - Obligations of the employer
- iii) Section Three: Subcontracting
- iv) Section Four: Termination of muqawala<sup>13</sup>

In U.A.E., Construction Contract is referred to as “muqawala”. It is defined under article 872 of the CTC which states that “a *muqawala* is a contract whereby one of the parties thereto undertakes to make a thing or to perform work in consideration which the other party undertakes to provide”.<sup>14</sup>

The Code provides freedom with regard to the supply of the construction materials. The normal approach in *muqawala* contract is that the construction contractor supplies the construction materials in accordance to specifications set by the Employer and install them as shown in the approved drawings. On the other hand, the Employer may wish to procure the construction materials and free issue them to the construction contractor. This approach is advisable if the Employer wishes to minimize the overall project schedule where he will save delivery time of the construction materials. Both approaches are identified in article 873 of the CTC which states that “(1) The agreement in a *muqawala* contract may be restricted to the contractor undertaking to provide work on condition that the employer provides the materials to be used, or that (the contractor) makes use of them in carrying out his work. (2) It shall also be permissible for the contractor to provide the materials and the work.”<sup>15</sup>

Under U.A.E. law, a construction contract is not required to be made in writing. Nonetheless, construction contracts are made in writing, because it can be used as a significant evidence tool in the event of dispute. It is very difficult to visualize a construction contract including all terms and conditions, that is made orally.

Construction contracts are of special nature due to their subject-matter. It is not realistic to believe that a project will always be completed in accordance to the approved

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<sup>13</sup> UAE, "Federal Law No. 5 Of 1985 Under The CTC" (1985).

<sup>14</sup> CTC Book Two, Ch.3 Part 1 (Muqawala) s.1 Art 872.

<sup>15</sup> CTC Book Two, Ch.3 Part 1 (Muqawala) s.1 Art 873.

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construction drawings and specifications. Thus, substantial (or practical) completion will be sufficient. In this context, article 874 of the CTC states that “In a muqawala contract, there must be a description of the subject matter of the contract, and particulars must be given of the type and amount thereof, the manner of performance, and the period over which it is to be performed, and the consideration must be specified.”<sup>16</sup>

The construction contract is a unique in nature. Its uniqueness is represented in the provision of specific remedy in case of breach of the terms and conditions and contractual entitlement in the event of risk occurrence. The construction contracts have several characteristics including:

- Complexity
- Highly technical and varying in expertise
- Involves huge sum of money
- Construction period that last for years.<sup>17</sup>

Under a lump sum contract, the scope of work and price are fixed. Subsequently, the request for additional cost to execute the originally agreed scope of work will not be accepted. On the other hand, additional work instructed by the Employer will eventually entitle the Contractor for a variation in order to recover the costs for the additional works. Under U.A.E. law, the variation in scope of work can be evidenced by any types of proof; i.e. a variation request could be by conduct, oral and / or in writing. Therefore, Employer’s consent of varied work could be proven by minutes of meetings, exchange of correspondence or determination of experts.

Whereas under a re-measurement contract, the final contract price is based on the final quantities executed at site and will be known only at the end of the project. U.A.E. law imposes an obligation on the contractor to immediately inform the Employer of any increase in quantities that will significantly increase the contract price. Failure of the Contractor to do so will result in losing the right to claim for the additional costs to

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<sup>16</sup> CTC Book Two, Ch.3 Part 1 (Muqawala) s.1 Art 874.

<sup>17</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] The International Construction Law Review, 1.

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complete the project. Unforeseen events, Force Majeure and arising circumstances due to third party may be considered as exceptions to the above principle.<sup>18</sup>

It is advisable to have the construction contract written by professionals. As a result, parties will have a well-defined contract without unclear or ambiguous clauses. This therefore, minimizes the probability of getting in to disputes. U.A.E. CTC addresses the interpretation of construction contract in article 265, which states “(1) If the wording of a contract is clear, it may not be departed from by way of interpretation to ascertain the intention of the parties.

(2) If there is scope for interpretation of the contract, an enquiry shall be made into the mutual intentions of the parties without stopping at the literal meaning of the words, and guidance may be sought in so doing from the nature of the transaction, and the trust and confidence which should exist between the parties in accordance with the custom current in dealings.”<sup>19</sup>

## 2.2. FIDIC Standard Contracts

FIDIC, for many years, had developed standard form of contracts that are internationally adopted. FIDIC contracts are recognized and used in many countries on all types of projects.<sup>20</sup> The main aim of FIDIC standard contracts is to fairly allocate risks between parties involved in the Contract. The general rule is that risks are allocated to the one who is capable to control them. This is clearly mentioned by FIDIC who stated “the key ingredient for their success as industry standard lies in their balanced approach to the roles and responsibilities of main parties, as well as the allocation and management of risk”.<sup>21</sup> FIDIC forms of contracts have been drafted to generally suite all cases through the use of General Conditions of Contract. Therefore, they contain a section of Particular Conditions and guidance on the preparation of these conditions.<sup>22</sup> On the other hand, Jonathan believes that there is a deficit between actuality and expectation in some of the FIDIC provisions. This means that the use of term Turnkey in Silver Book does not really reflect the complete transfer of risk to the

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<sup>18</sup> Celine kanakri, 'UAE Construction Sector: Know The Legal Do's And Don'ts | Gulf Business' (Gulf Business, 2015) <http://www.gulfbusiness.com/articles/insights/uae-construction-sector-know-the-legal-dos-and-don-ts/> accessed 9 December 2015.

<sup>19</sup> CTC Book One, Ch.1 Part 1 (Contracts) s.4 Art 265.

<sup>20</sup> Fidic.org, "Why Use FIDIC Contracts? | International Federation Of Consulting Engineers" <http://fidic.org/node/7089> accessed 9 December 2015.

<sup>21</sup> Ibid

<sup>22</sup> Ibid

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Contractor.<sup>23</sup> In FIDIC Silver Book, which is used in EPC projects, and in return of financial compensation, the construction Contractor takes over the majority of Employer's risks.

During execution of projects, it was noted that some projects fall outside the scope of the available FIDIC Red and yellow Books. Therefore, in 1999 FIDIC has published a new suite of four standard forms of contract that are applicable for majority of projects around the world.<sup>24</sup> It is stated that "The FIDIC Silver Book was produced in 1999, in response to a perceived need for a form of contract 'where certainty of final price, and often of completion date, are of extreme importance'. Its publishers also recognized that turnkey projects are popular in project financed deals, where lenders require greater certainty about a project's final costs than is allowed for under contracts that reflect the traditional allocation of risks, such as FIDIC's Red and Yellow Books".<sup>25</sup>

The new set of standard forms of contract produced by FIDIC in 1999 are:

“(a) The Construction Contract (Conditions of Contract for Building and Engineering Works, Designed by the Employer) – General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement, and Dispute Adjudication Agreement, referred to as the ‘1999 Red Book’;

(b) The Plant and Design-Build Contract (Conditions of Contract for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor) – General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement and Dispute Adjudication Agreement, referred to as the ‘1999 Yellow Book’;

(c) The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects) – General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement and Dispute Adjudication Agreement, referred to as the ‘1999 Silver Book’; and

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<sup>23</sup> Jonathan Hosie, "Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?" (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

<sup>24</sup> Fidic.org, "Which FIDIC Contract Should I Use? | International Federation Of Consulting Engineers" <http://fidic.org/bookshop/about-bookshop/which-fidic-contract-should-i-use> accessed 9 December 2015.

<sup>25</sup> Jonathan Hosie, "Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?" (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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(d) The Short Form of Contract – Agreement, General Conditions, Rules for Adjudication and Notes for Guidance, referred to text as the ‘1999 Green Book’.”<sup>26</sup>

In addition to the above mentioned forms, there are several new forms in use since 1999 and they are:

- “The Blue Book: Contract for Dredging and Reclamation Works;
- MDB/FIDIC Contract: FIDIC conditions incorporated in the standard bidding documents of multilateral development banks;
- The White Book: Client/Consultant Model Services Agreement;
- The Gold Book: FIDIC Design, Build and Operate Projects.”<sup>27</sup>

The old set of standard forms of contracts is divided on the basis of the type of the project. Whereas, the new set of standard forms is divided on the basis of who is responsible for the project designs. Although, the 1999 Red, Yellow and Silver books have similarities in several areas, they are in reality three separate and different forms of contract.<sup>28</sup>

As mentioned earlier, there are several FIDIC forms of contract and Employers should select the most relevant form to avoid difficulties in execution of the project at later stage. In order to determine which of contract to use, the Employer shall analyze his requirements as follows:

The FIDIC Red Book is selected if:

- The Employer will be responsible for the design i.e. carrying out the detail design or assigning an Engineer to do so and;
- The assigned Engineer will administer the contract, supervise the construction work and certify the payments and;
- Payments are according to Bill of Quantities or Lump Sum for the work done.

The FIDIC Yellow Book is suitable if:

- The Contractor is going to carry out majority of the detail design in accordance to Employer’s specifications and;

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<sup>26</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 15.

<sup>27</sup> Prof. Aymen Masadeh, "Construction Law In UAE" (British University in Dubai, 2015).

<sup>28</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 16.

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- The Employer's representative manages the contract, supervise the construction work and certify the payments and;
  - Payments are according to completed milestones mainly on Lump Sum basis.

The FIDIC Silver Book is used when:

- The Employer wishes to execute the project on basis of lump sum turnkey and;
- The Contractor takes the full responsibility of the detail design, procurement and construction and;
- The Employer wants to have confidence that the contract value and time will not be exceeded.
- The Employer does not wish to have an Engineer on board.
- The Employer prefers not to get involved in day to day activities.
- The Employer is willing to pay additional cost, in return the Contractor accepts to bear additional risks.<sup>29</sup>

By producing the standard forms of contracts, FIDIC is aiming to achieve pre-set objectives through their statutes and by-laws. Article 2 of FIDIC's Statutes and By-Laws set the organization's objectives as:

- 1- Represent consulting engineering firms globally
- 2- Enhance the image of consulting engineers
- 3- Be the authority on issues relating to business practice
- 4- Promote the development of a global and viable consulting engineering industry
- 5- Promote quality
- 6- Actively promote conformance to a code of ethics and to business integrity
- 7- Promote commitment to sustainable development.”<sup>30</sup>

Independence of the Engineer is an essential aspect of FIDIC forms of contracts. Hence, his role was developed throughout the years to maintain his independence. Additionally, the Engineer shall also be professional and competent.

The Silver Book is intended to be used for distinct projects. It is useful to note that although all three books, the 1999 Red, Yellow and Silver Books have the same format;

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<sup>29</sup> Fidic.org, "Which FIDIC Contract Should I Use? | International Federation Of Consulting Engineers" <http://fidic.org/bookshop/about-bookshop/which-fidic-contract-should-i-use> accessed 9 December 2015.

<sup>30</sup> Fidic.org, "STATUTES AND BY-LAW" [http://fidic.org/sites/default/files/FIDIC%20Statutes\\_2014\\_0.pdf](http://fidic.org/sites/default/files/FIDIC%20Statutes_2014_0.pdf) 10 December 2015.

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the Silver Book can be notable for the absence of the 'Engineer'. It is also known by its imbalanced risks allocation, with many risks shifted to the Contractor.<sup>31</sup>

There was a demand for a fixed, lump-sum contract price with no risk of price increase if unanticipated events occur. Employers would usually accept to higher price for the construction work through a fixed, lump-sum contract, as long as risks are allocated to the Contractor and there is assurance that price of the contract will not be adjusted. The Contractor responsibility, under the Silver Book, is a strict liability for design of the work and fitness for purpose of performance. Additionally, he is taken the burden of risk of any error, inaccuracy or omission of any kind that is referred in the Employer's Requirements. Employer's Requirements specify the works with respect to the purpose, scope, design, technical criteria.<sup>32</sup>

The FIDIC forms of contract are considered a re-measurable contract. Therefore, the Employer assumes the risk of additional costs associated with the increase in the quantities of construction materials. In general, governments in the Middle East prefer contracts with lump sum fixed price. As a result, the FIDIC forms of contract were modified to suit this tendency.<sup>33</sup>

Here in U.A.E., many construction contracts are drafted based on FIDIC standard contracts. Employers and Contractors, who are not aware of the law of U.A.E., may assume that their contract provisions will prevail over the provisions of the local law because their contract is based on FIDIC. Both, the Employer and the Contractor, should familiarize themselves with local laws and principles which impact their contractual agreement. In some cases, these local laws and principles will prevail over the contracting parties' terms. It is advisable, to be familiar with rights and obligations under the construction contract in terms of price, damages and termination.<sup>34</sup>

Middle East countries have been using FIDIC forms of contracts since the 1970s. Notwithstanding that the law in the Middle East countries, including U.A.E., who source their law from Shari'ah law and civil law, they have used FIDIC forms of contracts which is based on principles of English common law.

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<sup>31</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 581.

<sup>32</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 582.

<sup>33</sup> Edward Sunna and Omar Al Saadoon, 'FIDIC In The Middle-East' (FIDIC, 2007) <http://fidic.org/sites/default/files/FIDIC%20in%20the%20Middle-East.pdf> accessed 11 December 2015.

<sup>34</sup> Celine kanakri, 'UAE Construction Sector: Know The Legal Do's And Don'ts | Gulf Business' (Gulf Business, 2015) <http://www.gulfbusiness.com/articles/insights/uae-construction-sector-know-the-legal-dos-and-don-ts/> accessed 9 December 2015.

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It is worth to mention that Emirates of Abu Dhabi has officially adopted the FIDIC forms of contracts.<sup>35</sup>

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<sup>35</sup> Edward Sunna and Omar Al Saadoon, 'FIDIC In The Middle-East' (FIDIC, 2007)  
<http://fidic.org/sites/default/files/FIDIC%20in%20the%20Middle-East.pdf> accessed 11 December 2015.

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### 3. Chapter Two – Types of Construction Contracts in Oil and Gas Industry

#### 3.1. Contracting Method

Oil and gas projects are characterized by complexity, international involvement, and size. Thus, it becomes difficult to meet the objectives of the project regarding its anticipated quality, revenue, costs and completion time.<sup>36</sup> Consequently, the process of contracting and the type of contract selected at the early stages influences the progress of the project and its level of success. Contracts are considered tools to allocate tasks, risks and responsibilities. As a matter of principle, the party in a project who is able to control a risk should carry that risk. However, Contractors often carry risks whether they control them or not. As a result, this occurs at a high cost to the Employer.

When it comes to construction contracts, the method of contracting depends on the type of work that needs to be completed. Hence, construction contracts of oil and gas projects have wide and different contracting methods than regular construction projects. An understanding of the project profile is important in understanding the nature of the project. Summary of the project, information about the technologies required, details of the final product and details of desired level of performance are important aspects to consider when selecting method of contracting.<sup>37</sup> In the Middle East, projects could involve different types of contracts.

Regardless the type of contract used, the oil and gas sector requires the contractual agreement to consider several divisions detailing responsibilities, appropriate allocation of risks, scope of works & services, time frame, costs and the market situation.

It is stated that “the form of contract is dependent on the degree of design liability to be undertaken by the contractor. For example, if the employer wishes to specify the overall design, with the contractor being responsible only for detailed drawings, then the contract will need to contain performance requirements only for the elements that the contractor is to design, and these can be accommodated within a relatively conventional construction contract. Conversely, if the contractor is to undertake the conceptual design

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<sup>36</sup> Adedeji Badiru and Samuel Osisanya, *Project Management For The Oil And Gas Industry: A World System Approach* (CRC Press 2013)28.

<sup>37</sup> Mohammad Moazzami, Janaka Ruwanpura and George Jergeas, 'Conversion Method For Applying Convertible Contracts In Oil And Gas Projects', 4th Construction Specialty Conference (2013) [https://www.researchgate.net/publication/280807897\\_Conversion\\_Method\\_for\\_Applying\\_Convertible\\_Contracts\\_in\\_Oil\\_and\\_Gas\\_Projects](https://www.researchgate.net/publication/280807897_Conversion_Method_for_Applying_Convertible_Contracts_in_Oil_and_Gas_Projects) accessed 15 February 2016.

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as well as the details, then there needs to be carefully drafted list of employer's requirements, which may go beyond technical performance".<sup>38</sup>

The selection of contracting strategy is an essential aspect that can determine the achievement of objectives of the project. The selection of contracting strategy depends on the understanding of the project specific characteristics. Employers need to look at the various unique aspects of the project to determine the type of contract that needs to be used.<sup>39</sup> FEED and detailed design contracts are important in oil and gas. Further, EPC contracts have been used for many years involving local and foreign firms.

At the Concept phase of the project, the employer defines his scope of work in line with his requirements. Then the scope of work is tendered to interested bidders along with the Employer's general terms and conditions. After the Concept Consultant draws the overall lines of the project, it moves on to the FEED phase. Based on the Concept phase outcomes and selected preferred option, if more than one option is studied, a more detailed scope of work is defined and issued for tender. Before awarding the FEED contract, the scope of work is refined through technical queries that are raised by bidders and responded by the Employer. In general, at this stage the FEED Consultant / Contractor prepares a basic design as per the scope requirements as well as EPC scope of work and EPC cost estimate for the next phase. At this stage, the Employer has an option either to move to EPC contract or assign a detail design Consultant to execute the engineering details of the scope. If an EPC track is selected, then the EPC contractor is required to subcontract the engineering design to an approved engineering firm. It is worth mentioning that some of EPC contractors have the facilities and capabilities to perform in-house engineering. Therefore, such contractors are invited to bid for the Concept, FEED and Detail Design projects.

It is stated that "The aim of the concept design phase is to confirm viability of the project and to maximize operability and economics. It is also a chance to perform value engineering and process simulations to reduce capital and operating costs. It is a phase where several scenarios are reviewed to optimize the design".<sup>40</sup>

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<sup>38</sup> John Uff, *Construction Law* (7<sup>th</sup> edn, Sweet & Maxwell 2013) 352.

<sup>39</sup> Adedeji Badiru and Samuel Osisanya, *Project Management For The Oil And Gas Industry: A World System Approach* (CRC Press 2013)33.

<sup>40</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] *Construction Law*, 12.

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Similar to other phases of the project, this phase is associated with various risks. For example, the risk of mismatch between the design parameters or chemical composition and the design basis or the specifications remains with the Employer. All the subsequent engineering design is based on the initial data and requirements provided by the Employer. Therefore, if the input data are incompatible then the output of the design will not be useful. The problem may get worse if the Employer proceeds to execute the project. At the time of project handover, the Employer will realize that the final products or quantities do not meet his expectations.<sup>41</sup> Another type of risk that needs to be considered is the assurance of sufficient quantities in the oil and gas reservoirs. The Employer should carry out all tests required to ensure that there are enough quantities and they are commercially worthy before proceeding further. Otherwise, the Employer will not be able to recover the invested capital.

EPC approach utilizes the construction Contractor's design experience to achieve a higher degree of constructability. This approach also, provides an assurance that the project value will not be exceeded which is known as guaranteed maximum price. Since the design and construction is executed by the same firm (EPC Contractor), then the design responsibility relies with the Contractor. This provides an advantage to the Employer over the other contracting methods because the chance of his involvement in any dispute due to design error is eliminated. Although this approach is quicker than other contracting methods due to the overlap between design and construction phases and eliminating several bidding phases, it may be risky to award to the lowest bidder. This is because of the tendency that the Employer be involved in a contract with an incompetent contractor.<sup>42</sup>

### 3.2. FEED and Detail Design Contracts

Front End Engineering Design (FEED) contracts are ones that are utilized after the preliminary feasibility study and conceptual design work have been completed on a proposed project.<sup>43</sup> In any oil and gas project, the completion of feasibility study and the acquisition of relevant approvals from local authorities and / or shareholders give the Employer the opportunity to proceed with tendering the FEED contract. The Consultant

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<sup>41</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] Construction Law, 12.

<sup>42</sup> Jimmie Hinze, *Construction Contracts* (2nd edn, McGraw Hill 2001) 19, 21.

<sup>43</sup> The-eic.com, "The EIC > Eicdatastream > Eicdatastream Glossary > Project Profiles And Contract Types" (2015) <http://www.the-eic.com/EICDataStream/EICDataStreamGlossary/ProjectProfilesandContractTypes.aspx> accessed 3 October 2015.

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assigned to this contract must focus on specific technical requirements and produce technical documents including rough estimates of the cost of the next phase of the project. This stage is before the EPC phase and it involves various studies that intend to understand the detailed technical issues of the project. Companies that complete the FEED contracts need to reflect the Employer's intention and the specific requirements of the project. Therefore, the FEED contract must include several types of deliverables that address different areas of the project.<sup>44</sup> All these deliverables must be completed to avoid any major changes to the scope of the project during the EPC phase. Typically, the FEED contract and related work takes between 6 months to 1 year for large oil and gas projects. It may require less time if the project is of reduced scope and complexity.

During the execution of FEED contract, it is important for the Consultant to maintain close coordination and communication with the Employer to ensure clear understanding of his requirements. It is also important to adhere to the project schedule and completion date to ensure that FEED results are provided on time for the timely start of the EPC phase. In coming section, the main components of the FEED contracts will be addressed.

First, the FEED contract may include a package that deals with specialised technology required for the project. This part of the FEED looks at the amount of technology or applications that need to be implemented in the project. Obviously, this means having a clear understanding of the required applications to be used and required equipment, layout, resources and techniques that will assure achievement of project scope. The level of required technology in any project determines the manpower requirements, implementation time and the cost of the project. At this point, it is important to develop clear picture of the sections of the project that require the specialized technology so that the equipment, and applications can be designed and ordered to reduce overall project schedule.<sup>45</sup> The other important FEED package focuses at the production levels and rates. In oil and gas contracts, it is critical to consider the anticipated levels of production and the equipment, materials, manpower and layouts that are important to support such a level of production.

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<sup>44</sup> The-eic.com, "The EIC > Eicdatastream > Eicdatastream Glossary > Project Profiles And Contract Types" (2015) <http://www.the-eic.com/EICDataStream/EICDataStreamGlossary/ProjectProfilesandContractTypes.aspx> accessed 3 October 2015.

<sup>45</sup> Adedeji Badiru and Samuel Osisanya, *Project Management For The Oil And Gas Industry: A World System Approach* (CRC Press 2013) 13, 67.

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This is an important part to be satisfied with because it has impact not only on the overall costs of the project but also the revenue that the project is likely to provide. The production rate is important and it may depend on the investment in advanced technologies to maximize the production with as little resources as possible. The next FEED part that needs to be addressed is the specification of materials to be used in the project. The materials to be used in a project differ according to the purpose of the project. The FEED engineers have to consider the technologies and production levels discussed above and identify the required materials. This is important so that they can recommend the best materials for the desired production level and to be integrated with other FEED parts. Not all materials are compatible with each other, hence specific requirements and unique features of the project may require special materials.

FEED contracts also have included industry standards and policies that have been set in the country. In U.A.E., the oil and gas sector has unique guidelines. The oil and gas sector is regulated by authorities. The FEED contract considers regulations regarding oil and gas production, materials, and equipment requirements. Therefore, the FEED contract ensures that the project meets the requirements established in regulations and policies of the country. This ensures that any issues, disputes, and challenges related to regulations are avoided throughout the project lifecycle. The FEED also identifies any assumptions, unique aspects and potential problems to proceed with the project. FEED contract will mark such items as important so that when the EPC contract is being developed, the Employer can take note of these items. Ultimately, the FEED contract must cover the following as minimum activities: project specifications, design basis, define major interfaces, safety and health rules, preliminary models, equipment list, equipment layout plans, and next phase scope of work.<sup>46</sup> The other deliverables include project schedule, estimated cost of the project and the technical drawings such as Process Flow Diagrams (PFDs).

Once the FEED contract has been fully executed and accepted by the Employer, the project can proceed to the Detailed Design Contract. The detailed design contract is performed based on the results of the FEED phase. Detail design contract aims to further define, develop and detail every aspect of the project to provide detailed descriptions and design. Detailed design contracts convert the FEED results into an

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<sup>46</sup> Frederick B. and Plummer Jr., *Project Engineering: The Essential Toolbox For Young Engineers* (Butterworth-Heinemann 2007) 51.

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engineering design that can be executed and specifically tailored to the specifications of the Employer. The contractor has to work closely with the equipment fabricators and suppliers. The contractor can also work with the installation sub-contractors to closely manage the contractual and technical interfaces.<sup>47</sup>

The detailed design phase may develop several descriptive models and documents to show the different options of implementing the technical requirements of the project. The development of CAD (Computer Aided Design) has greatly benefitted the oil and gas projects. CAD programs can ensure optimization and better understanding of the different sections of the project. Additionally, the ability to build models using 3 dimensional (3D) facility of the CAD program provides engineers with an opportunity to graphically and clearly represent sections of the project. This approach has proved efficient in taking the results of the FEED phase and converting them into clear and specific scope of the EPC project. The outcome of the detailed design phase can differ from project to project considering the initial requirements and the output of the FEED phase. These outcomes may include the following: required materials, technical considerations, operating philosophy, specifications, pre-commissioning and commissioning procedures, operating parameters, testing and routine maintenance.

According to Jimmie, the design-bid-build (FEED and Detail Design) contracts have certain characteristics (advantages). These advantages can be summarized as follows:

- 1- The Employer gains from the competitive market;
- 2- The Employer is being impartial;
- 3- The process presents the fundamentals of the free market philosophy.

Whereas the disadvantages of the design-bid-build (FEED and Detail Design) contracts may include one or more of the following:

- 1- Final costs cannot be determined until the detail design is completed;
- 2- Bids which exceed the Employer's estimated budget may consider a risk of proceeding with the project;
- 3- The detail design is usually prepared without construction expertise involvement;

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<sup>47</sup> Genesis Oil and Gas Consultants Ltd, "Detailed Design - Realise - Asset Lifecycle Services - Services - Genesis Oil And Gas Consultants Ltd" (2015) <http://www.genesisoilandgas.com/Services/Asset-lifecycle-services/Realise/Detailed-Design/> accessed 4 October 2015.

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- 4- Errors or omissions in the detail design may result in costly change orders;
  - 5- This approach is not suitable for complex projects.<sup>48</sup>

### 3.3. EPC Contracts

The EPC contracts are also known as Turnkey contracts. In principle, they mean that the Contractor is responsible to provide all necessary requirements to deliver a certain purpose. The idea behind the EPC contracts is to make the Contractor responsible for the Engineering design whether it is executed in-house or assigned to a Consultant Engineer, then construct the work and install the equipment as recommended in the design. After that, commission the facility and make it ready for startup on the agreed completion date. At the end, hand over the facility to the Employer ready for operation.<sup>49</sup>

In oil and gas projects, it is critical to deliver the project on time and within budget. It is also important to hand over the facility to the Employer with the capability of meeting the designed production levels. By investing a huge capital, the Employer is expecting to complete the project on time with the required quality to start generating revenue.<sup>50</sup> This importance is referred to in clause 8.2 of the General Conditions of the FIDIC Silver Book.

EPC Contracts, as the name suggests provides a single-point agreement with a Contractor to undertake necessary, engineering, procurement, and construction activities.<sup>51</sup> With such a contract, the scope of work includes engineering design, the supply of equipment & materials, installation & construction and commissioning of the facilities. The Contractor is also responsible for other tasks in the project such as training of Employer's staff, start-up, and all acceptance testing activities as per the end user requirements. Therefore, all necessary tasks are handed over to the Contractor and all required data / resources are provided, so the Contractor can give a 'turnkey' project / system to the Employer after completion.

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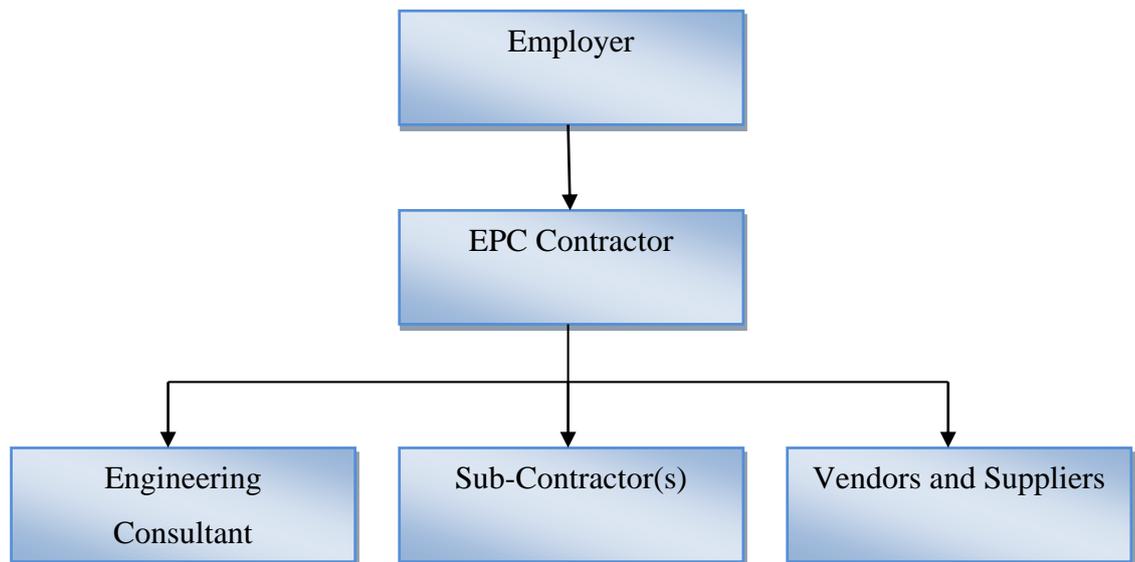
<sup>48</sup> Jimmie Hinze, *Construction Contracts* (2nd edn, McGraw Hill 2001) 117.

<sup>49</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

<sup>50</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

<sup>51</sup> Adedeji Badiru and Samuel Osisanya, *Project Management For The Oil And Gas Industry: A World System Approach* (CRC Press 2013)316.

With an EPC Contractor, the Employer has a central point of contact, responsibility, communication and coordination for the said project. The Contractor must deliver a complete project at the agreed cost and date. The project is also required to be in accordance to the agreed performance levels as determined by the requirements provided to the Contractor. Due to the fact that the Contractor acts as a single-point of control, the risks in EPC type contracts are meant to be allocated and transferred to the Contractor.<sup>52</sup> This often leads to higher contract prices so that contingencies and mark-up are included to protect against the risks that may be encountered by the Contractor. There are substantial risks that accrue to Contractors and these risks may be related to increases in cost, time extension, potential losses and performance issues.



**Figure 1: An EPC type contract structure.**

In these types of contracts, the Employer's job is to administer the contract and ensure that work is being executed as per the contract terms and conditions. Interfacing with the Contractor requires proper management of responsibilities, communication & coordination to ensure that all tasks and activities are addressed and completed on time. As shown in the figure above, the EPC Contractor has to work with the Employer and

<sup>52</sup> Professional Management, "Professional Project Management Education: Contract Clauses In EPC Oil And Gas Projects: A Case Study Of The Pearl Development Project" (*Professionalprojectmanagement.blogspot.com*, 2009) <http://professionalprojectmanagement.blogspot.com/2009/10/contract-clauses-in-epc-oil-and-gas.html> accessed 4 October 2015.

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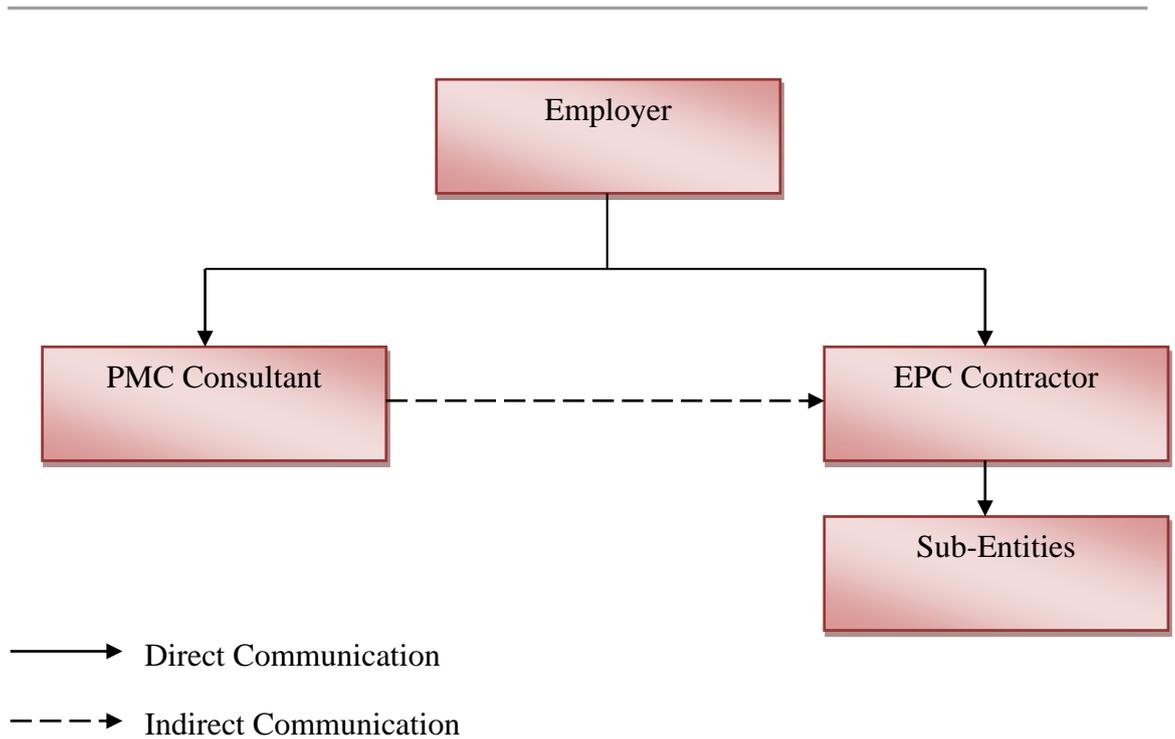
several sub-entities in order to execute activities and tasks related to the project. It is the responsibility of the EPC Contractor to ensure that all the sub-entities engaged on the project are aware of the set conditions. They must comply with the set requirements and delivery schedules.<sup>53</sup> EPC type contracts have several characteristics and the main ones are listed below:

- a) Single point of responsibility for the design, procurement and construction.
- b) Full responsibility of the EPC Contractor for communication, coordination and work completion.
- c) The project price and completion date are guaranteed.
- d) Clear assignment of liabilities, obligations and most of risks are assumed by the EPC Contractor.
- e) Higher contract price comparing to other contracting methods.
- f) EPC contracts can have less completion schedule due to overlap of the design and procurement activities.

Because of several sub-entities in this type of contracts, it is important to pay attention to management and coordination activities. Proper management and coordination procedures have to be adopted and followed. The procedures have to determine the point where the responsibility of the Employer ends and where the point of responsibility of the Contractor begins. Even though most of the responsibilities remain with the Contractor, the Employer has to manage the project either through his own resources or by assigning a Consultant to provide a PMC (Project Management Consultancy) services to complete such task. The PMC Consultant can offer services that include review of technical deliverables, supervision, advice and management & technical assistance. In such an arrangement, the coordination and communication in the project can be described through the figure below.

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<sup>53</sup> Professional Management, "Professional Project Management Education: Contract Clauses In EPC Oil And Gas Projects: A Case Study Of The Pearl Development Project" (*Professionalprojectmanagement.blogspot.com*, 2009) <http://professionalprojectmanagement.blogspot.com/2009/10/contract-clauses-in-epc-oil-and-gas.html> accessed 4 October 2015.



**Figure 2: A PMC involvement structure.**

The PMC may offer advance services to the Employer and such a firm may be allowed to indirectly deal with subcontractors. The Employer may require the PMC to help in defining of scope of work, finalizing of project schedule and determining of project needs. Ultimately, the PMC Consultant brings in expertise in the area of project management to help the Employer interface, communicate and coordinate with the EPC contractor. Otherwise, the Employer can use his resources in the completion of these tasks. EPC type contracts are very common in the Middle East in oil and gas.

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## 4. Chapter Three – Change Orders

### 4.1. Variations

A variation can be defined as any deviation in a contract from the agreed scope of work, duration, quality and terms & conditions. It is not accurate to assume that the variation is always positive and to the benefit of the Contractor. It is possible to experience a negative variation which may work to the benefit of the Employer. As an example, this occurs when the Employer reduces the awarded scope of work or quality of certain aspects of the project. Usually, Employers give themselves the right to add, delete or revise the work or any part of it during any time of the project life. In case of variation, the total agreed price and / or duration need to be re-considered accordingly. Such modification is issued through a negative variation order.

In certain mega projects, there will be a requirement of different skills, equipment and materials which may not be available with one EPC Contractor. Therefore, the Employer will assign different EPC packages (Process package, utilities package and infrastructure package) to different EPC Contractors. The Employer has to define battery limits to each EPC Contractor to avoid clashes between the different EPC Contractors. Having said that, the Employer has to closely monitor and coordinate the interface between these Contractors to guarantee correct and smooth transition of information among the different packages.<sup>54</sup> Any failure of passing the required information among the different EPC Contractors will eventually cause a chaos, delays and certainly claims which require to be managed through variation orders.

Employer's failure to provide input data to facilitate the engineering design and / or the procurement process will affect the EPC Contractor's performance. Providing accurate data and on time to the EPC Contractor will help in smooth execution of the project and keep the blame of delay away from the Employer. Moreover, the Employer is expected to review and approve the technical documents and drawings within certain duration. Usually this duration is specified in the contract or in the planning package. Not being able to approve the technical documents and drawings within the agreed period will unnecessarily prolong the engineering phase and subsequently the overall project schedule will be extended. In such circumstances, the Employer assumes the

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<sup>54</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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responsibility for the delay occurred. Thus, the new completion date will have impact on the budget of the EPC Contractor. To keep manpower and equipment at the construction site for longer period than anticipated will cause an additional cost to the EPC Contractor which will require to be covered through a variation.

Sub-clause 5.2 of the Silver Book emphasizes that Employer has the right to review all technical documents including calculations and drawings. Also, the sub-clause does not require the Employer to approve these technical documents. Additionally, sub-clause 5.8 keeps the risk and responsibility of correctness of the technical documents with the Contractor, even though these technical documents were reviewed and approved by the Employer. According to GAEDE, a combination of both sub-clauses (5.2 & 5.8) may expose the Employer to claims for interference.<sup>55</sup>

Sub-clause 5.8 [Design Error] of the Silver Book states “If errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the Contractor’s Documents, they and the Works shall be corrected at the Contractor’s cost, notwithstanding any consent or approval under this sub-clause.”<sup>56</sup>

One of the EPC contract principles is the guarantee of the contract final price. Therefore, it is the preferred choice of many Employers. The guarantee of the price is clearly mentioned in Sub-clause 4.12 [Unforeseeable Difficulties] which provides that “Except as otherwise stated in the Contract

- a) the Contractor shall be deemed to have obtained all necessary information as to risk, contingencies and other circumstances which may influence or affect the work;
- b) by signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; and
- c) the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs”.<sup>57</sup>

As mentioned earlier, under the FIDIC Silver Book, EPC Contractor takes full responsibility of the entire engineering design. The detail design during the EPC phase is based on the FEED executed at earlier stage and passed to the EPC Contractor during tendering stage. The point of contention is who assumes the design liability of the initial

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<sup>55</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] *The International Construction Law Review*, 483.

<sup>56</sup> Nael, Bunni, *The FIDIC Forms of Contract* (3rd edn, Blackwell, 2005) 585.

<sup>57</sup> Sub-Clause 4.12 [Unforeseeable Difficulties], *The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects)*.

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design work? Is it the Employer whom the FEED was undertaken on behalf of him or the EPC Contractor who is been asked to take full responsibility of FEED as part of the tendering requirement. The FEED is considered the basis for the detail design. Meaning, during the detail design, the initial design work is being elaborated and detailed in a way it can be constructed. The problem starts when the initial design contains a mistake or a change is required to be made during the execution of the detail design. This could trigger a dispute between the contracting parties. The Employer could argue that the change is a development of the initial design and it is the responsibility of the EPC Contractor to carry out this change in order to meet the objective of the project. On the other hand, the EPC Contractor will challenge by arguing that the initial design was conducted on behalf of the Employer and he has no control over it.<sup>58</sup> In such situation, it is advisable to request the EPC Contractor to prepare and issue FEED Endorsement Report. In this report, the EPC Contractor will review the initial design and check correctness and completeness. Also, it will highlight to the Employer any discrepancies in the initial design which will influence the detail design and the procurement process. Hence, it will have cost and time impact on the EPC project. By this, the Employer will be advised in an earlier stage whether a design change is anticipated or not. Then, the Employer will have the opportunity to evaluate such change and decide on possibility of accommodating this change. Of course, any change introduced will have to be covered by variation order.

Sub-clause 5.1 [General Design Obligations] of FIDIC Silver Book states “The Contractor shall be deemed to have scrutinized, prior to the Base Date, the Employer’s Requirements (including design criteria and calculations, if any). The Contractor shall be responsible for the design of the Works and for the accuracy for such Employer’s Requirements (including design criteria and calculations), except as stated below.

The Employer shall not be responsible for any error, inaccuracy or omission of any kind in the Employer’s Requirements as originally included in the Contract and shall not be deemed to have given any representation of accuracy or completeness of any data or information, except as stated below. Any data or information received by the Contractor, from the Employer or otherwise, shall not relieve the Contractor from his responsibility for the design and execution of the Works. However, the Employer shall

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<sup>58</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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be responsible for the correctness of the following portions of the Employer's Requirements and of the following data and information provided by (or on behalf of) the Employer:

- a) Portions, data and information which are stated in the Contract as being immutable of the responsibility of the Employer,
- b) Definitions of intended purposes of the Works or any parts thereof,
- c) Criteria for the testing and performance of the completed Works, and
- d) Portions, data and information which cannot be verified by the Contractor except as otherwise stated in the Contract.”<sup>59</sup>

Sub-clause 5.1 shifts the responsibility of the Employer's Requirements and design of the works to the Contractor. The Contractor is deemed to have carefully examined these Requirements. This sub-clause works as Employer's disclaimer for liability for any error, inaccuracy or omission in the Employer's Requirements. These exceptions show that the Contractor cannot totally be held responsible for Employer's errors in performance criteria and definitions of the works because they were within the Employer's control.<sup>60</sup>

Item (d) of sub-clause 5.1 above provides relief to the Contractor if the information and data provided by the Employer cannot be verified. In both civil law and common law jurisdictions, a party should not be relieved from its error or fault. However, the Silver Book shifts away the concept of risk should be undertaken by the party who is best to control it and the Contractor is expected to take the risk of the Employer's mistakes. Moreover, the Employer does not bear any responsibility if he fails to disapprove any work. This disapproval shall not constitute approval of the work and shall not waive the Employer's right to reject the work. This is related to the defective work and any other work that is not in accordance to the Contract requirements. In summary, the Employer has authority without responsibility.<sup>61</sup>

However, the rejection by the Employer of earlier approved design, materials or work, will require a re-work. Obviously, this re-work will constitute of time and cost. In a

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<sup>59</sup> Sub-Clause 5.1 [General Design Obligations], The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects.

<sup>60</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] The International Construction Law Review, 392.

<sup>61</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] The International Construction Law Review, 481.

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typical EPC contract, the change in law entitles the Contractor to submit a variation order in the event that the change has resulted in additional time or cost to the works. The relevant article states that “Any changes in the laws, rules and regulations introduced by the government after the effective date of this Contract shall, where applicable, be implemented by CONTRACTOR. Should these changes affect the execution and/or cost of the Works in any way, the affected party shall be entitled to initiate a Variation Order .....).”<sup>62</sup>

The Contractor has an overall obligation to complete the work as defined in the scope of work. This means that the Contractor shall supply all services and materials required for the execution of the work. Non-compliance with this obligation will result in loss of payment for work not completed, recovery of rectification costs, apply liquidated damages or termination of contract.<sup>63</sup>

#### 4.2. Schedule and Extension of Time

Extension of time is a mechanism included in the contract to provide flexibility to different milestones of the project. It facilitates the work and the contractual relationship between the Employer and the Contractor in case of changes or variations are introduced to the originally agreed scope of work. Without extension of time clause, argument may raise and lead to dispute and disagreement especially if the delay is attributed to the Employer. Therefore, it provides a relief to the Contractor against liability for liquidated damages, if he fails to complete the project on time. Under the FIDIC Silver Book, the Contractor is not obliged to mitigate the cause of delay to be entitled for extension of time. This provision need to be amended to encourage the parties to closely manage and control activities to mitigate delays. If the initial design requires changes more than a design development, then this contributes to a formal variation. Moreover, the interruption or delays caused by another EPC Contractor may slow the project progress. Thus, this will influence the Contractor’s progress and may prevent him from achieving the time for completion. Hence, Contractor will be entitled or extension of time and this is not in line with the purpose of EPC / turnkey contracts.<sup>64</sup>

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<sup>62</sup> Sub-Article [Changes in Law], EPC Contract.

<sup>63</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] The International Construction Law Review, 393.

<sup>64</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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FIDIC Silver Book Introductory Note indicates that this type of contract is not suitable where the Employer's intention is to closely monitor and control the Contractor's work or review the construction drawings. On the other hand, the FIDIC Silver Book gives some control of project's completion to the Employer. The Employer controls different aspects such as Determination, Contractor's General Obligation, Quality Assurance, Contractor's Documents Contractor's personnel, etc.<sup>65</sup>

There are factors may have effect on the EPC Contractor's work and commitment. These factors could be one or more of the following:

- i- Factors within the EPC Contractor's organization, or
- ii- Factors from the Employer, or
- iii- Factors from a third party.

The qualification and efficiency of the EPC Contractor's employees are essential for executing the work in a timely manner. Any delay in assigning an Engineering Consultant to handle the design of the project or delay in executing the design internally, if engineering capability is available with the EPC Contractor, will eventually delay the completion of key aspects of this phase and hence delay the start of the procurement process. In addition to that, during procurement stage the EPC Contractor may engage low-priced vendors to reduce the procurement cost and maximize his profit. This strategy may have direct impact on the project quality and completion time. These vendors either will not be able to deliver the ordered materials on the agreed time or will deliver them with technical deviations and less quality. Because of this, the Employer insists that the EPC Contractor should approach only pre-approved vendors.

Input data are important to execute and finalize the detail design. Project schedule could be prolonged due to unavailability of input data or delay in providing them to the EPC Contractor. Furthermore, uncertainty of project objectives will result in putting the whole or part of the scope of work on hold. As a result, the EPC Contractor will be entitled for extension of time.

Interruption to the project progress may occur due to behavior of a third party. The interruption has many scenarios, for instance, government authorities, vendors or other

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<sup>65</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] The International Construction Law Review, 409.

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Contractors. Most of the time, these scenarios of interruption are unforeseen and not predictable. However, some times the EPC Contractor is not aware of government procedures that are essential to start or complete his work. This non-awareness does not exempt him from bearing the responsibility of the delay. Additionally, lack of close coordination with other Contractors, who exist at the same location, might affect the progress of work and put the EPC Contractor in unpleasant situation.

Sub-clause 4.1 [Contractor's General Obligations] of FIDIC Silver Book, provides that the Contractor to submit methods which he proposes to execute the works. If the Employer does not agree with the execution methods, he might issue instruction to the Contractor to adopt certain methods. This may be considered as interfering in the Contractor's execution methods which may sound not appropriate for an EPC project.<sup>66</sup> If Employer's preferred methods require longer execution time, then the project schedule should be revised to reflect a new completion date.

The interference of the Employer extends beyond the changes of the technical documents and method statements to inspection of the works. The inspection is seen by the Employer as a way to make sure that the work was executed in accordance to the scope of work and Employer's Requirements. On the other hand, it is seen by the EPC Contractor as additional way to introduce changes which may slow down the project progress.

The Contractor is required to provide details of the subcontractors that he plans to use throughout the project. However, the Silver Book does not state whether the Employer can approve the subcontractors. Sub-clause 4.5 [Nominated Subcontractors], addresses the issue of nominated subcontractors. This sub-clause does not oblige the Contractor to engage Employer's nominated subcontractors. This freedom is warranted if the Contractor raised reasonable objections as soon as practicable and supported with particulars. This exception opens the door for arguments on phrases like "reasonable", "as soon as practicable" and "particulars".<sup>67</sup>

While reviewing the technical documents, the Employer may provide comments that change the proposed design. Also, may introduce changes in the execution strategy or construction method statements. If failure occurs at later stage due to these changes,

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<sup>66</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] *The International Construction Law Review*, 482.

<sup>67</sup> *Ibid.*

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who will be held responsible? Is it the Employer who introduced these changes or the EPC Contractor who incorporated these changes?<sup>68</sup> The delays in completion of works are borne by the Contractor under the FIDIC Silver Book. This is due to the fact that the Contractor is responsible for the project and construction management and is best able to control the risk of completion on time. The time for completion is covered in sub-clause 8.2 [Time for Completion] of the FIDIC Silver Book, which states “The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

- (a) Achieving the passing of the Tests on Completion, and
- (b) Completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections]”.<sup>69</sup>

Although the Contractor is responsible for the timely completion of the project, there are certain cases where the Contractor will not be responsible for delays. These cases are addressed in Sub-Clause 8.4 [Extension of Time for Completion]. It is stated that “The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor’s Claim] to an extension of Time for Completion if and to the extent that completion for the purpose of Sub-Clause 10.1 [Taking Over of the Works and Sections] is or will be delayed by any of the following causes:

- (a) A Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure],
- (b) A cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions, or
- (c) Any delay, impediment or prevention caused by or attributable to the Employer, the Employer’s Personnel, or the Employer’s other Contractors on the Site.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Employer in accordance with Sub-Clause 20.1 [Contractor’s Claim]. When determining each extension of time, the

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<sup>68</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] *The International Construction Law Review*, 483.

<sup>69</sup> Sub-Clause 8.2 [Time for Completion], *The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects)*.

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Employer shall review previous determinations and may increase, but shall not decrease, the total extension of time”.<sup>70</sup>

Item (b) of the Sub-Clause 8.4 can be interpreted to cover other grounds for extension of time under the Silver Book. Some other possible grounds for time extension are:

- Delays caused due to failure to give access to the Contractor to the Site within the agreed time,
- Delays due to archaeological discovered on the Site,
- Delays caused due to changes in technical standard, laws or regulations,
- Delays caused due to Employer’s instructions to change or detail the tests or to conduct additional tests,
- Unforeseeable delays caused by public authorities,
- Delays due to Employer’s instruction to suspend the work provided that the suspension was not because of Contractor’s fault,
- Delays due to suspension of work by the Contractor because of Employer’s failure to make payment,
- Delays caused by Force Majeure event,
- Delays due to occurrence of Employer’s risks.<sup>71</sup>

Above grounds will not only grant extension of time, some of them will also have cost impact. The Contract price might be revised based on these grounds, although the Contractor did confirm sufficiency of the contract price.

In comparison with 1999 Yellow Book, grounds that do not entitle the Contractor an extension of time under the Silver Book are as follows:

- “Sub-clause 1.9: Errors in the Employer’s Requirements;
- Sub-clause 4.7: Setting Out;
- Sub-clause 4.12: Unforeseeable Physical Conditions.”<sup>72</sup>

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<sup>70</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] *The International Construction Law Review*, 399.

<sup>71</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] *The International Construction Law Review*, 400.

<sup>72</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 586.

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The FIDIC Silver Book does not warrant extension of time to the Contractor for Exceptionally Adverse Climatic Conditions or Unforeseen Shortages in the availability of Goods or Personnel due to epidemic or Government actions.<sup>73</sup>

Liquidated damages provisions in the Silver Book are provided in case of non-performance of the Contractor. Liquidated damages work as a relief to the Employer and allow him to receive the liquidated amount without referring to court or arbitration. From positive point of view, the liquidated damages clause provides incentive to the Contractor to complete the work on time. The delay is counted from the date of completion until the date of the taking over certificate. However, there is a cap for the maximum amount that can be claimed under liquidated damages. It is important to bear in mind that the liquidated damages are the only damages that can be taken from the Contractor.<sup>74</sup>

Limitation of liability clauses are formed of two parts. The first part is the mutual waiver of liability by each party for any indirect or consequential loss. There are exceptions to this waiver such as to indemnities and Contractor's loss of profit. The second part is the financial cap on liability. In general, the total liability of the Contractor shall not exceed the contract price. In the two parts, the Employer is not assured to obtain what he aimed for when he awarded the Contractor the work based on FIDIC Silver Book. The direct loss such as replacement of work or cost of repairs could be recovered through the delay damages.<sup>75</sup>

Construction contracts usually include liquidated damages clauses. These clauses are valid and enforceable in U.A.E. with some exceptions. However, the Employer and the Contractor should bear in mind that the court has the power to re-evaluate the damages upon the request of one of the contracting parties. In such situation, the party requesting the re-evaluation of damages has the burden to proof the actual damages caused to the other party. Irrespective of any contractual agreement, compensation for exact damages,

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<sup>73</sup> Robert Knutson, "Articles On FIDIC Contracts And Agreements | International Federation Of Consulting Engineers" (*Fidic.org*, 2016) <http://fidic.org/node/6159> accessed 19 January 2016.

<sup>74</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] *The International Construction Law Review*, 406.

<sup>75</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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loss of opportunity, moral damages and loss of profit can be claimed under U.A.E. law.<sup>76</sup>

The completion date of the project is a key milestone that needs to be focused on. The project may not be completed within the agreed schedule due to different causes. However, the EPC Contractor has to control these causes to mitigate the shift of end date. Moreover, the EPC Contractor has to design the facilities as described in the scope of work and within the time frame allowed for the Engineering phase. This is to warrant that the procurement phase starts as scheduled and the selected materials are within the budget.<sup>77</sup>

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<sup>76</sup> Celine kanakri, 'UAE Construction Sector: Know The Legal Do's And Don'ts | Gulf Business' (Gulf Business, 2015) <http://www.gulfbusiness.com/articles/insights/uae-construction-sector-know-the-legal-dos-and-don-ts/> accessed 9 December 2015.

<sup>77</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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## 5. Chapter Four – Risks and Dispute Resolution

### 5.1. Risks in Oil and Gas Construction Projects

The main principles of risk allocation were first discussed in 1973 by Max Abrahamson. These principles were considered the ground rules for equitable and fair allocation of risks in construction projects. These principles are:

- Risks are within party's control,
- Party can transfer risks,
- Economic benefit of risk controlling lies with the same party,
- Placing a risk upon a party is in the interests of incentive, efficiency and innovation,
- Upon occurrence of risk, the same party shall take the loss.

However, the above mentioned principles were developed and proposed in four wider principles as follows:

- Which party is best to control the risk and its consequences?
- Which party in best position to foresee the risk?
- Which party can bear the risk?
- Which party suffers or benefits from the occurrence of the risk?<sup>78</sup>

One aspect of having written contract for construction projects is the distribution of risks between the parties. Also, it attempts to identify who bears what risk and the consequences of that risk. In theory, the risk should be allocated to whom is best to control it. However, practically, in oil and gas industry the risks are generally shifted to the Contractor.<sup>79</sup>

As stated in earlier chapter, the construction contract should contain a clear language with regard to risk allocation. If the construction contract is silent or contains weak description of allocation of risks, then the above principles may provide guidance to a judge or arbitrator.

The concept of risk allocation is based on the principle of the ability to control the risk and its consequences. If a risk cannot be avoided, then it has to be mitigated and if it is

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<sup>78</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] The International Construction Law Review, 9.

<sup>79</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] Construction Law, 9.

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not possible, it has to be transferred. The willingness of a party to accept the risk transfer generally relies on the following:

- Level of control it has over that risk;
- How familiar it is with that risk;
- The need for remuneration;
- How much it is worth to accept the transfer of that risk.<sup>80</sup>

It is very important to use simple and clear words in writing the risk allocation clauses. It is advisable to make sure that the contract is integrated in terms of legal rules of the governing law and scope of work including technical documentations. The harmony between different parts of the contract is a risk remains with the Employer throughout the contractual period and cannot be shifted to another party. The FIDIC Silver Book is an exception to this principle, where section of Employer's Requirements shifts the liability of errors from the Employer to the Contractor.<sup>81</sup>

There are different factors that influence the extent of risk allocation to the Contractor under EPC contract. These factors include the availability and strengths of completion guarantees from the Employer. In case that the Employer could not provide to the financier, if different than the Employer, guarantees that the project will be completed on time, then he needs to allocate the risk of completion to the Contractor.<sup>82</sup>

It is argued that the market pressure affects the willingness to accept risks included with EPC contracts. When the economy is booming, it results in a high demand of petroleum products. Subsequently, it will push the oil price in to new high levels and this will encourage the oil producing countries / companies to invest more money to increase the oil production. This market pressure impacts the willingness of assuming higher risks through the involvement in EPC contracts. On the other hand, during decreased demand circumstances, Contractors may have less appetite for risks and this means that the EPC strategies are no longer attractive due to several and high risks involved. The decreased demand situation may lead to engagement of the Contractors in contracts consist of two stages. The first stage is reimbursable FEED contract where the Contractor becomes more confident on the scope of work, the anticipated cost and duration. Then the

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<sup>80</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] Construction Law, 10.

<sup>81</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] The International Construction Law Review, 7.

<sup>82</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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contract can be converted in to a lump sum EPC contract. This arrangement can be concluded through a single contract that has the mechanism to convert the FEED reimbursable contract to a lump sum EPC contract. Otherwise, the Employer and the Contractor may have a separate FEED and EPC contracts. Thus, the Employer will have to have enforceable terms in the first contract to ensure that the Contractor will enter in to a lump sum EPC contract with all its risks without any re-negotiation of EPC contract terms and conditions.<sup>83</sup>

The idea of EPC contracts is to provide the Employer with single point of responsibility. This approach is attractive because it will push away the difficulties in deciding who might be at fault, when unpleasant event occurs.<sup>84</sup> According to Bunni, “The allocation of risks to various parties in a contract has a significant impact on the type of contract form that one might appropriately use”.<sup>85</sup> In certain cases, the single point of responsibility is not feasible. Jonathan suggests that “if the third party company which owns the technology license is not the same company that undertakes the work under turnkey terms, there is an obvious difficulty in obtaining a single-point responsibility wrap under one contract from one EPC Contractor”.<sup>86</sup> This scenario will cause interface clash if the technology did not work as it was supposed to. The Employer may shift this risk to the EPC Contractor by assigning him the responsibility of procuring the technology and interface with the third party and be responsible of its performance.

The site difficulties are of different types. The difficulties could be of relocating or crossing underground utilities and / or pipelines. It is very important to initially identify the types and number of underground utilities. The number of the crossings and the depth of the underground utilities will significantly have effect on project’s cost and schedule. The underground utilities can be detected through topographical survey work. This activity will exactly determine the type, depth and size of the underground utilities and pipelines. Another type of site difficulties is the type of the soil of the construction site. Geotechnical investigation is usually conducted to analyze the different layers of the soil in terms of types and stiffness. This is required to safely design the foundations

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<sup>83</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

<sup>84</sup> Ibid.

<sup>85</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] *The International Construction Law Review*, 7.

<sup>86</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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and perform technical calculations. Also, the type of soil will determine the depth and method of the construction. For example, laying steel oil / gas pipeline through a salty soil will require additional precautions to protect the pipeline from corrosion and extend the life of its service. Regardless the type of the site difficulties, the cost and time of the project may get affected and one of the parties has to be ready to take that risk.

Test of foreseeability is a tool used to evaluate unforeseen ground conditions. Both FIDIC Red and Yellow Books adopt the foreseeability test. The Employer guarantees the accuracy of the data that were extracted during FEED and provided to Contractor during the tendering for EPC stage. In such situation, the Contractor is responsible for interpretation of such information. In terms of allocation of risks of physical conditions under the FIDIC Red and Yellow Books, the Employer carries such risks if they could not have been foreseen by experienced Contractor. However, in FIDIC Silver Book, this risk is been dealt with differently. While the Employer provide the data to the Contractor, the Contractor is responsible for verifying and interpreting these data. Moreover, the Employer does not warrant the sufficiency and / or the completeness of the provided data. Thus, the risk of site conditions is allocated to the Contractor. In this case, the Contractor should be allowed sufficient time to satisfy himself to contingencies and risks of the site conditions. Alternatively, the investigation of site conditions could be undertaken in the FEED phase on reimbursable basis.<sup>87</sup>

The unforeseen ground conditions are covered in sub-clause 4.10 [Site Data] of FIDIC Silver Book that states “The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer’s possession on subsurface and hydrological conditions at the site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come in to the Employer’s possession after the Base Date. The Contractor shall be responsible for verifying and interpreting all such data. The Employer shall have no responsibility for the accuracy, sufficiency or completeness of such data, except as stated in sub-clause 5.1 [General Design Responsibilities]”.<sup>88</sup>

With regard to site conditions, there are two scenarios. The first one is to shift the risk of site conditions to the Contractor. In this case, the Contractor will increase his price

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<sup>87</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

<sup>88</sup> Sub-Clause 4.10 [Site Data], The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects).

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and include a contingency to account for the unforeseen. If difficulties are encountered at site, then both the Employer and the Contractor will be in a win-win situation. However, if normal terrain is experienced, then the Employer would pay for costs never incurred. Conducting site investigation by Contractors incurs time and money. Contractors, during bidding stage, usually are not given enough time and chance to review and confirm the provided data. The Employer is the party who sets the deadline for the tender submission and usually it is not enough period. It is not practical to make all the Contractors (bidders) to carry out the same thing at the same time (site investigation). Additionally, it is not fair to other Contractors who did not win the project to spend time and money to satisfy themselves with site conditions. Practically, the oil and gas fields are considered restricted areas and the Contractor is not allowed to mobilize to site and carry out any physical work, including site surveys, unless he is engaged through official signed contract. The signed contract is the basis for Letter of Assistance (LOA) which will be used to apply for security passes and work permits. Nevertheless, even if a signed contract is not required, the process of obtaining LOA and security passes are lengthy and time consuming. According to Joseph “The attribution of risk to the contractor regarding site data essentially requires every bidder (assuming, for example, a project which includes works of underground construction) to conduct its own subsurface and hydrological study of the site conditions before being able to develop an appropriate tender offer”.<sup>89</sup> It is inefficient to make each bidder to conduct the survey instead of relying on single site survey prepared by the Employer.

The FIDIC Silver Book states in its Introductory Note that “These Conditions of Contract for EPC/Turnkey Projects are not suitable for use in the following circumstances:

- If there is insufficient time or information for tenderers to scrutinize and check the Employer’s Requirements or for them to carry out their designs, risk assessment studies and estimating (taking particular account of Sub-Clause 4.12 and 5.1).
- If construction will involve substantial work underground or work in other areas which tenderers cannot inspect.

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<sup>89</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] The International Construction Law Review, 394.

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FIDIC recommends that the Conditions of Contract for Plant and Design-Build be used in the above circumstances for Works designed by (or on behalf of) the Contractor”.<sup>90</sup>

The situation gets more complicated when the Contractor does not include a contingency to account for site unforeseen or include little. As a result, the project may end up in a mess because the Contractor will be less capable of performing due to shortage of cash. As matter of fact, it is difficult to price for unforeseen. All Contractors, involved in the bidding, are aiming to submit the lowest price to win the project. Hence, each one will be reluctant to include high contingency in order to keep the price as low as possible.

The second scenario is to remain the risk of site conditions with the Employer. The Employer may conduct site investigation and provide the data to the Contractor or allow for cost in the provisional sum of the BOQ to be used if difficulties encountered at site. This approach is more beneficiary to the project and maintains the control of the Employer over the project.

According to GAEDE, there are several provisions that do not clearly state the shift of risks. He also suggests that if the Contractor encounters unforeseen conditions that will result in significant impact on cost and time, the Contractor will argue the unfairness of shifting such risk and will search for solutions to avoid or minimize the financial consequences. The Contractor may base his argument on sub-clause 5.1 (d) and claim that the Employer did not allow sufficient time to verify the site data provided by the Employer before submitting the bid. Alternatively, the Contractor may claim that the encountered ground condition was circumstance or exceptional in order to implement the Force Majeure provision including sub-clause 19.4 that allows for recovery of cost and time.<sup>91</sup>

It is supported by Joseph that the exception in 5.1 (d) consists of a language that may create uncertainty and ambiguity as to what data cannot be verified by the Contractor. It is suggested to detail this sub-clause by providing a list of data from the Employer’s Requirements that cannot be verified by the Contractor. Perhaps this will limit the

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<sup>90</sup> [Introductory Note], The EPC and Turnkey Contract (Conditions of Contract for EPC Turnkey Projects).

<sup>91</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] The International Construction Law Review, 489.

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claims of the Contractor on the basis that the information in the Employer's Requirements could not be verified.<sup>92</sup>

Employer's risks are covered under sub-clause 17.3 of the Silver Book. Obviously they are less than the Red Book and do not include the followings:

- "Use of occupation by the Employer or any part of the Permanent Works, except as may be specified in the Contract.
- Design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible.
- Any operation of the forces of nature which is unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions."<sup>93</sup>

It could be logical that the risks addressed in the Employer's Requirements under the FIDIC Silver Book are allocated to the Contractor. However, the transfer of the last two risks quoted in Sub-clause 17.3 is substantial and should alert the parties that high risk means high contingency cost. Honestly, contingency in such situations could only be theoretical since even an experienced Contractor may not be able to make a realistic risk assessment of the exceptional forces of nature.<sup>94</sup>

Jonathan believes that, in practice, the allocation of risk is frequently changing. Based on the market condition, the risk may increase or decrease to the Contractor. Decreasing the risk is by shortening the list of liabilities of the Contractor. The Employer's Requirements include provisions and notes on design drawings which need to be considered by the Contractor because it forms part of the contract and it may increase the Contractor's responsibility. Some of these provisions require fixing the design or confirmation from equipment vendor.<sup>95</sup> When there is a high demand and limited supply by vendors on certain equipment, the Employer may face resistance from the

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<sup>92</sup> Joseph Huse, 'Use Of The FIDIC Silver Book In The Context Of A BOT Project' [2000] *The International Construction Law Review*, 392.

<sup>93</sup> A H GAEDE, 'The Silver Book: An Unfortunate Shift From FIDIC's Tradition Of Being Evenhanded And Of Focusing On The Best Interests Of The Project' [2000] *The International Construction Law Review*, 500.

<sup>94</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 587.

<sup>95</sup> Jonathan Hosie, 'Turnkey Contracting Under The FIDIC Silver Book: What Do Owners Want? What Do They Get?' (FIDIC, 2007) <http://fidic.org/sites/default/files/hosie06.pdf> accessed 11 December 2015.

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Contractor to assume full responsibility. Hence, risk transfer can be agreed provided that sufficient compensation or contingency is in place.<sup>96</sup>

Although the FIDIC Silver Book is based on turnkey principle and shift of risks to the Contractor, there are risks that remain with the Employer such as Force Majeure. This is the approach of all FIDIC forms of contracts with reference to Force Majeure. Both cost and time impact resulted from Force Majeure remain with the Employer. The Force Majeure clause could be amended to list and define what is to be considered Force Majeure. This will eliminate any possible ambiguity in interpretation of this clause.<sup>97</sup>

This clarity, to some extent, has been considered in standard local oil and gas EPC contracts. The article defines the Force Majeure event and its causes. It also lists what to be considered as Force Majeure event and what is not. The article states that “Any delay in, or failure of, performance by either Party to this Contract shall be excused and shall not constitute default, if and to the extent that such delay or failure results from causes beyond the reasonable control of and without fault or negligence of the Party whose performance is so affected. Such causes, hereinafter referred to as "Force Majeure", shall include without limitation:

- a) National strikes, lockouts, and other industrial disturbances (but excluding strikes or other industrial action occurring solely among the employees of CONTRACTOR);
- b) Fires, floods, storms, earthquakes, landslides, and other natural physical disasters; and
- c) Wars, blockades, insurrections, riots, and revolutions.

Force Majeure shall not include:

- a) Financial distress of either Party, and
- b) Late delivery of materials or equipment or late performance by a Sub-contractor unless such late delivery or performance is itself caused by Force Majeure”.<sup>98</sup>

It should be noted that to consider a Force Majeure event, it has to cause a delay or prevention in performance of any of the parties. The article imposes an obligation on the parties to take all reasonable measures to remove the cause of Force Majeure or mitigate

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<sup>96</sup> Ibid.

<sup>97</sup> Ibid.

<sup>98</sup> Article [Force Majeure], EPC Contract.

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its effects. The Force Majeure case will continue as long as the circumstances causing it continue to exist.

Another type of risks associated with oil and gas projects is Payments and cash flow. On time payments are essential for any project to maintain a positive cash flow. Payments could be on milestone basis or based on percentage completion. Regardless the payment method adopted in the contract, the Contractor should progress the work on time in order to be entitled of on time payments. This will guarantee a positive cash flow in the project which will allow him to pay his employees, vendors and sub-contractors on time. On the other hand, the Employer shall not delay the payment when it is due or reject the Contractor's invoice due to disagreement of the invoiced amount or simple mathematical error. Employer's intransigence in acceptance of the invoice may complicate the situation and cause a negative cash flow to the Contractor. This may result in deficit of the Contactor which will jeopardize the project. Oil and gas projects involve procurement of large number of materials and equipment which are usually very expensive. Hence, it is not practical to reimburse the Contractor for the procurement upon arrival or installation of the materials. Interim payments based on the progress of the procurement process will help the Contractor to fulfill his commitments.<sup>99</sup>

The close out and project acceptance is the most phase causes problems in oil and gas projects. It is a time when the Contractor rushes for completion trying to recover a delay, the punch list is being prepared, getting ready for commissioning and start-up. This period is critical for both parties who are focusing on hand-over and acceptance of the project. During this stage, equipment may fail the performance test and it will take long time to find out whether the failure is due to faulty equipment or due to incorrect commission and start-up of the equipment. Moreover, failure of equipment during the warranty period may cause a dispute between the Employer and the Contractor as who is responsible of the failure. Is it because of shortfall in the design, faulty component or lack of maintenance of the equipment? The issue gets worse if the equipment failure requires facilities shutdown for repair.<sup>100</sup>

It is argued that the exposure to risks in construction fields is higher than any other location. For a given project, the possible risks should be listed and analyzed with

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<sup>99</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] Construction Law, 21.

<sup>100</sup> Vincent Hooker, 'Major Oil And Gas Projects - The Real Risks To EPC Contractors And Owners' [2010] Construction Law, 22.

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specific reference to that project and surrounding circumstances. The process of identifying and analyzing risks is referred to as Risk Management and it is done in a form called Risk Register. After identifying the risks, they shall be classified in chronological way where the risks are grouped as pre-construction, during construction, post-construction. Upon identifying risks, the Employer has to determine whether these risks are of high, medium or low levels. Also, has to decide whether these risks are acceptable or not and if acceptable can they be mitigated. Then, the Employer has to decide on retaining the identified risks or transferring them to other parties such as insurer or Contractor.<sup>101</sup>

After risk identification process, it is time to identify which party can best control it based on duties under the contract and works to be executed. It is important to decide whether another party can control, prevent or manage that risk. If the other party is identified, then both to decide whether sharing the allocation of risk and its consequences is a preferred approach or not.<sup>102</sup>

## 5.2. Contracts Dispute Clauses and Resolution

Typically, the main sources of disputes in construction contracts are poor definition of scope of work, unsuitable contract type and lack of coordination and communication.<sup>103</sup> Most if not all construction contracts, contain clauses for dispute resolution through arbitration. Disputes in construction contracts are inevitable. However, many of the disputes are resolved through negotiations. When negotiations fail to settle the dispute amicably, the parties would either proceed to arbitration or litigation. There are also alternative dispute resolution methods considered such as Dispute Board. FIDIC Silver Book adopts the Dispute Board mechanism as first step in settlement of a dispute. The Dispute Board can be one of the following:

- Dispute Review Board;
- Dispute Adjudication Board;
- Combined Dispute Board.<sup>104</sup>

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<sup>101</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] *The International Construction Law Review*, 7.

<sup>102</sup> Nael Bunni, 'The Four Criteria Of Risk Allocation In Construction Contracts' [2009] *The International Construction Law Review*, 10.

<sup>103</sup> Bryan Shapiro, 'TRANSFERRING RISKS IN CONSTRUCTION CONTRACTS' (Shapiro Hankinson & Knutson, 2013) <http://www.shk.ca/wp/wp-content/uploads/2013/02/Transferring-Risks-in-Construction-Contracts-BSS.pdf> accessed 1 April 2016.

<sup>104</sup> Nael Bunni, *The FIDIC Forms Of Contract* (3<sup>rd</sup> edn, Blackwell 2005) 604.

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As stated earlier, U.A.E. is a civil law jurisdiction and provisions related to construction contracts are codified in the CTC. It should be noted that some of these provisions are mandatory and the contracting parties have to derivate the contract terms out of them. This is required if the parties seek enforcement in the U.A.E even if their contract is subject to foreign law. The same is applicable if arbitration committee or a foreign court is competent to rule on their dispute. Therefore, regardless whether application of a foreign law to a local construction contract or submission of disputes to an arbitration committee / a foreign court, some provisions of U.A.E. law will prevail. The issue of foreign law will not arise if the dispute is referred to international arbitration. U.A.E. courts will enforce the international award as applicable to the Convention on the Recognition and Enforcement of Foreign Arbitral Awards 1958 (New York Convention) as long as it does not violates a rule of public order, moral or Islamic Shari'ah. In principle, contracting parties can agree to refer their disputes to local / foreign arbitration or UAE court / a foreign court. U.A.E. courts may accept to hear the dispute of the parties if the dispute falls within the courts' jurisdiction and there is a legal relation to the U.A.E., despite of the any agreement to refer the dispute to foreign court or international arbitration.<sup>105</sup>

Arbitration is recognized in the U.A.E. legal system and it is important to be familiar with the laws and procedures that affect the issue of enforcement of arbitral awards. On the other hand, adjudication is not recognized in the U.A.E. as a mechanism of dispute resolution even if a FIDIC contract was used as the contractual agreement. According to Edward Sunna “the parties should assess their project and decide on the dispute resolution mechanism that would be best suited to their particular needs. For example if the parties intend to have an enforceable award in the event a dispute arises, then a Dispute Boards may not be appropriate. Arbitration results in an award by a tribunal that is enforceable at law. Determinations made by Dispute Boards are not enforceable at law as such, although they may become contractually binding on the parties”<sup>106</sup>

One aspect is important to be aware of when using international standard contract and that is termination of contract. The termination can be by agreement of the parties or unilateral. Both ways are possible under U.A.E. law, provided that there are clear

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<sup>105</sup> Habib Al Mulla and Celine Kanakri, 'Legal Issues Relating To Construction Contracts In The United Arab Emirates' (*Baker Mckenzie*, 2015) [http://www.bakermckenzie.com/files/Uploads/Documents/EMEA/ar\\_uae\\_constructionprojectsguide\\_Oct15.pdf](http://www.bakermckenzie.com/files/Uploads/Documents/EMEA/ar_uae_constructionprojectsguide_Oct15.pdf) accessed 17 January 2016.

<sup>106</sup> Edward Sunna, 'HOW CAN DISPUTE BOARDS BENEFIT YOU?' [2007] Westlaw Gulf, 3.

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contractual clauses on termination. For the termination to be valid there should be a notice period and it should be served unless agreed otherwise. Upon termination of a construction contract, the entire contract is considered as nonexistent. This means that U.A.E. law provisions will govern all aspects of the dispute regardless of any agreed provisions in the terminated contract. Hence, restitution will be evaluated and awarded. In case restitution is not possible, evaluation of the compensation will be based on unjust enrichment.<sup>107</sup>

The oil and gas projects are of complex nature and may involve several parties with relevant interfaces. Some of these projects involve multi-national parties, consortium and other joint relationships.<sup>108</sup> Therefore, a concern to the Employer is how to prevent the risk of multiple proceedings and what remedies the Employer will have in case the project is jeopardized. It is advisable to provide in the contract the possibility of Joinder of Parties. This will ensure that relevant disputes raised out of more than one contract can be brought before and resolved in a single forum. Hence, this method will prevent overlap proceedings, delays, risk of conflicting decisions and additional costs. Many of the contractual dispute clauses are drafted considering involvement of two parties in a contractual relationship. Thus, these clauses need to be re-drafted to suite involvement of more than two parties.<sup>109</sup>

As mentioned earlier, the oil and gas contracts are modified version of the EPC Silver Book. Therefore, many clauses were revised to be applicable to U.A.E. market. As an illustration, a standard article in a typical domestic oil and gas EPC contract states “All applicable laws, rules and regulations of ..... shall apply to CONTRACTOR's business, equipment and personnel engaged in performance of the Works”.<sup>110</sup>

Since the Dispute Board mechanism is not available in U.A.E., oil and gas contracts provide a standard clause for arbitration as alternative mechanism to litigation. The clause states “All disputes and controversies arising in connection with the performance or interpretation of this Contract which cannot be settled amicably shall be finally settled by arbitration carried out according to the then existing Rules of Conciliation and

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<sup>107</sup> Celine kanakri, 'UAE Construction Sector: Know The Legal Do's And Don'ts | Gulf Business' (Gulf Business, 2015) <http://www.gulfbusiness.com/articles/insights/uae-construction-sector-know-the-legal-dos-and-don-ts/> accessed 9 December 2015.

<sup>108</sup> PATRICK BOURKE and AMANDA GREENWOOD, 'Solving Multi-Party Dispute' (Construction Management Guide, 2009) <http://www.cmguide.org/archives/1522> accessed 2 April 2016.

<sup>109</sup> RALPH BUSCH, 'CONSTRUCTION CONTRACTS FOR OFFSHORE FARMS' [2014] The International Construction Law Review, 436.

<sup>110</sup> Sub-Article [Laws, Rules and Regulations], EPC Contract.

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Arbitration of the International Chamber of Commerce (except as varied by this Article) by three arbitrators. COMPANY and CONTRACTOR will each appoint one arbitrator within two weeks from the date of written request by either Party to the other to refer the dispute to arbitration. The two arbitrators so appointed shall agree on a third arbitrator, or in the case of disagreement, either Party may apply to the Chamber of Commerce and Industry to appoint the third arbitrator. The arbitration shall be held in ..... and its proceedings shall be conducted in English. The decision of the arbitrators shall be final and binding on the Parties and any decision rendered may be submitted to any court having jurisdiction over the dispute for judicial enforcement of the decision.”<sup>111</sup>

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<sup>111</sup> Article [Arbitration], EPC Contract.

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## 6. Conclusion

The purpose of this paper was to discuss construction contracts in the oil and gas industry. In this regard, the paper sought to meet objectives namely, to discuss the different aspects of FEED, detail design and EPC contracts and as well as their influence on oil and gas projects. Additionally, it discussed the relationship of different contracts and their impact on the project performance. Also, it sought to assess some of the risks involved in these types of contracts and the role of risk allocation in reducing disputes.

As previously mentioned, change orders have impact on contracts in terms of variations and project schedule. The impact may result in direct and indirect costs and entitlement of extension of time. If this impact is not addressed properly, it may lead to dispute between the Employer and the EPC Contractor. With respect to risks involved in oil and gas contracts, it is clear that these contracts are subject to a wide range of risks of different levels and allocated to different contracting parties. As matter of principle, these risks need to be allocated to the party who is best able to control them in order not to jeopardize the project success. It was noted that the FIDIC Silver Book was introduced as a response to Employers need to have a single point of responsibility in contraction contracts with the ability to absorb more risks. Additionally, it supposed to be used for EPC projects with certain purposes. The main risks noted include: scope of work, ground conditions, Force Majeure, completion on time, payments, failure of equipment and market conditions.

A risk register has to be developed to identify and analyze possible risks that might be encountered throughout project life. In order to mitigate the identified risks, the contracting parties must take suitable measures. One of these measures is fair allocation of risks even if the contract has already assigned such risks. Unfair allocation of risks leads to disputes between the contracting parties and put the whole project at risk. As a result, it is fair to conclude that fair allocation of risk has a major role in preventing disputes and successfully mitigate and resolve such risk in case it occurs. Therefore, the main role of risk allocation is to improve project performance and avoid arbitration / litigation costs.

The discussion has also indicated that for an oil and gas project to be successful, several factors have to be considered. The main factors are: well defined scope of work, project

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objectives, realistic project duration, risks analysis, flexibility of contracting parties and committed project cost. As discussed earlier, failure to consider these factors while selecting contracting method may result in using of an inappropriate contract which may eventually impact the success of the project.

Contract administration, legal characteristics, and regulatory considerations may differ from country to country. However, basic characteristics of EPC contracts and their nature are similar. They provide a single point of responsibility and execution for all engineering, procurement, and construction activities of an oil and gas project.

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