# COMPARISON OF INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS AND GENERAL SPECIFICATION FOR PUBLIC WORKS CONTRACTS FROM RISK MANAGEMENT PERSPECTIVE

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
CIVIL ENGINEERING

AUGUST 2005

Approval of the Graduate School of Natural and Applied Sciences

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# ABSTRACT

## COMPARISON OF INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS AND GENERAL SPECIFICATION FOR PUBLIC WORKS CONTRACTS FROM RISK MANAGEMENT PERSPECTIVE

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August 2005, 117 pages

Contractors have to construct the projects efficiently in accordance with the contract provisions when they accept a contract. All construction projects involve risk and there is no possibility to eliminate all the risks associated with a specific project. Management of risk requires identification and analysis of risk factors. After this risk assessment step, proper response strategies have to be developed so that an optimum risk-reward structure is ensured. Contracts are the grounds where risk allocation schemes between parties are settled and risk-reward mechanisms are defined. Since contractors are usually unable to influence the contract conditions and clauses, they should understand which risks they are retaining under contract conditions. Thus, succesful management of risk requires understanding of contract clauses and identification of secondary risk factors created due to poorly defined contract clauses.

The aim of this thesis is to investigate standard conditions of contract, namely FIDIC and GSPW, which are the most widely utilised contracts by the Turkish contractors, from the risk management point of view. For this purpose an interview form is prepared and interviews are conducted using this structured form. Implications of the contract clauses for the risk management strategy of contractors are discussed based on interview findings. The basic philosophy of FIDIC and GSPW are investigated so that necessary suggestions for the contractors can be made considering the risk allocation schemes defined in these documents.

**Keywords:** Contract Administration, Risk Management, FIDIC, General Specification for Public Works (GSPW).

# ÖZ

## FIDIC VE BAYINDIRLIK İŞLERİ GENEL ŞARTNAMESİNİN RİSK YÖNETİMİ PERSPEKTİFİNDEN KARŞILAŞTIRILMASI

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Ağustos 2005, 117 sayfa

Müteahhitler, bir sözleşmeyi kabul ettiklerinde, projeyi sözleşme şartlarına uygun ve yeterli şekilde tamamlamak zorundadırlar. Tüm inşaat projeleri risk içerir ve belirli bir projeyle ilişkili tüm riskleri ortadan kaldırmanın imkanı yoktur. Risk yönetimi, risk faktörlerinin tanımlanmasını ve analizini gerektirir. Risk değerlendirme aşamasından sonra uygun risk önlem stratejileri geliştirilmelidir. Böylece, en uygun risk getiri dengesi sağlanabilir. Sözleşmeler, taraflar arasındaki risk paylaşım planının oluşturulduğu ve risk getiri dengesinin oluşması için gerekli mekanizmaların tanımlandığı zeminlerdir. Müteahhitler sözleşme şartlarını ve ifadelerini çoğunlukla değiştiremeyeceklerinden, sözleşme şartlarına göre hangi riskleri üstleneceklerini iyice kavramalıdırlar. Bu nedenle başarılı bir risk yönetimi, sözleşme şartlarını anlamayı ve yetersiz tanımlanmış sözleşme şartlarının neden olacağı dolaylı risk faktörlerini belirlemeyi gerektirir.

Bu tezin amacı, Türk Müteahhitleri tarafından en çok kullanılan standart FIDIC ve Bayındırlık İşleri Genel Şartnamesinin, sözleşme eki olduğu durumlarda, sözleşme koşullarının risk yönetimi açısından incelenmesidir. Bu amaçla bir görüşme formatı hazırlanmış ve bu format kullanılarak görüşmeler yapılmıştır. Bu görüşmelerin sonuçlarına dayanarak, müteahhitlerin risk yönetim stratejilerinin farklı sözleşme şartlarına göre nasıl değişmesi gerektiği irdelenmiştir. Bu dokümanlarda tanımlanan risk paylaşım planları göz önüne alınarak ve FIDIC ve Bayındırlık İşleri Genel Şartnamesinin temel felsefeleri incelenerek, müteahhitler için risk yönetim stratejileri üretilmiştir.

**Anahtar Kelimeler:** Sözleşme Yönetimi, Risk Yönetimi, FIDIC, Bayındırlık İşleri Genel Şartnamesi (BİGŞ).

To My Family

# ACKNOWLEDGEMENTS

I want to gratefully thank to Assoc. Prof. Dr. İrem Dikmen Toker and Prof. Dr. Talat Birgönül, without whom I would not be able to complete my thesis, for their unconditional support, patience and tolerance at each step of this study.

I would like to express my appreciation to my family members, my father Adem Usta, my mother Hazan Usta and my brother Erdem Usta, for their endless love and efforts that encouraged me to realize my goals.

I wish to thank to all respondents who are involved in the interview study for their assistance.

I should thank to all my friends, who have believed in me in the way to achieve this study, for their sincere and continuous love.

Finally, I would like to thank to Duygu, from whom I have always received spiritual and remarkable support and who made me feel strong all the time.

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| | |
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| **AGC** | Associated General Contractors |
| **CECC** | Civil Engineering Contracts Committee |
| **CICA** | Confederation of International Contractors' Associations |
| **CIB** | Construction Industry Board |
| **CII** | Construction Industry Institute |
| **CM** | Construction Management |
| **CRMS** | Construction Risk Management System |
| **EIC** | European International Contractors |
| **FIDIC** | Federation of International Consulting Engineers |
| **GSPW** | General Specification for Public Works |
| **ICC** | International Chamber of Commerce |
| **ICE** | Institution of Civil Engineers |
| **PMI** | Project Management Institute |
| **PRM** | Project Risk Management |
| **RC** | Relational Contracting |

# CHAPTER 1

# INTRODUCTION

It is known that many Contractors lose money due to poor management of risk. Management of risk requires identification and analysis of risk factors. After this risk assessment step, proper response strategies shall be developed so that an optimum risk-reward structure is ensured. Contracts are the grounds where risk allocation schemes between parties are settled and risk-reward mechanisms are defined. Thus, successful management of risk requires understanding contract clauses and identification of secondary risk factors created due to poorly defined contract clauses.

The aim of this thesis is to investigate standard conditions of contract, namely FIDIC and GSPW, which are the most widely utilized contracts by the Turkish Contractors, from the risk management point of view. Implications of the contract clauses for the risk management strategy of Contractors will be discussed based on interview findings. The basic philosophy of FIDIC and GSPW will be investigated so that necessary suggestions for the Contractors can be made considering the risk allocation schemes defined in these documents. For this purpose, thesis is organized in 7 chapters.

In the second chapter, important issues related to contract administration are explained since the risks are allocated to contracting parties through contract conditions. This chapter gives necessary steps to successfully manage the contractual elements of a construction contract. Types of contracts and relationships between contracting parties are explored. At the end of the chapter,

issues such as claims between contracting parties and tools for contract administration are mentioned.

In the third chapter, principles of project risk management for the Contractors are covered. In this chapter, how the Contractors build a construction risk management system is discussed. Moreover, risk management strategies for Contractors are proposed. Finally, risk allocation schemes in contracts are explored so that risks can be managed successfully.

In the fourth chapter, general information about the FIDIC and GSPW contracts are given.

In the fifth chapter, the aim of the interviews is given and the administration and contents of the interviews are mentioned.

In the sixth chapter, research findings are organized under main headings. Role of the Engineer and the obligations of the Employer and the Contractor under the conditions of FIDIC and GSPW are discussed from the risk management point of view. Risk allocation between Employer and Contractor is explained under both contract provisions. Besides, suggestions that are beneficial for the Contractors are discussed. Finally, basic differences of the conditions of FIDIC and GSPW contracts with respect to risk allocation scheme are mentioned.

This thesis also includes an appendix at the end of the main text. In Appendix A, a sample of the interview form related to the research study can be found.

# CHAPTER 2

# CONTRACT ADMINISTRATION

The general Contractor in today's construction world has an important and responsible function to perform when he accepts a contract. The basic construction contract is between the Employer and the Contractor, and it is the Contractor's duty to produce the building or facility in accordance the plans and specifications. One (or both) usually retains an Engineer to interpret and clarify the contract plans in a fair, impartial manner (Shively, 2000). The parties of a construction contract, the Employer and Contractor, are a society with a complex set of interrelated relationships requiring cooperation and collaboration to coordinate time, resources, and communication. The main goal of the contracting parties is to execute works in accordance with contract provisions within specified time and planned budget (Harmon, 2003).

The general Contractor in today's construction world has a very difficult and important function: to execute satisfactorily all accepted contracts. The Contractor must take an Employer's ideas and turn them into reality. These ideas are usually in the form of drawings and specifications. The basic construction contract between the Employer and the Contractor calls for the Contractor to construct a building or facility in accordance with these plans and specifications. It is very important that both the Contractor and the Employer have the same understanding of these documents (Kreitzberg, 2000).

The term contract is defined as ‘an agreement between two or more parties, sometimes written and enforceable by law’. The term administration is defined as ‘the management of affairs’. As mentioned in the definitions of the contract and administration terms, the contracting parties, the Employer and the Contractor, should be aware of all activities involved in a proper contract administration and importance of it for successfully completion of the construction project. This chapter outlines the necessary steps to successfully manage the contractual elements of a construction contract. Firstly, organization for the contract administration and contract relationships will be examined. Then, types of contracts will be given in the following sections. Next, contract components will be discussed. Finally, administration tools for Contractors and conflicts and claims between contracting parties will be explained in detail.

## 2.1. Organization for Contract Administration

Shively (2000) argues that Employer is not in the business of construction. At the project inception they often establish a project office which is charged with the task of controlling the project. From this office, the initial bidding, negotiation and administrative and contractual follow-up are conducted. It is vital that the individuals assigned by the Employer to administer the construction contract be experienced and well qualified in the areas of both contracts and construction. As Harmon (2003) states, though the Contractor and Employer are interdependent upon one another, since the objective of having a project successfully constructed is a mutual objective, the Employer has the power and can effectuate change to increase the satisfaction of both parties.

The Employer assigns a project manager, field representative, and clerical assistants to administer the general contract according to its requirements. These people interact with the various departments of the general Contractor, including estimating, purchasing, accounting and special services. The general Contractor maintains a contract-administration office that performs many of the same functions but also focuses on subcontracts. The typical Employer-Contractor-

Architect-Engineer, organization chart is shown in Figure 2.1 (Kreitzberg, 2000). In those situations where a construction manager (CM) is involved in the project, three of the most common Employer-Architect-Engineer-CM organizational relationships are illustrated.

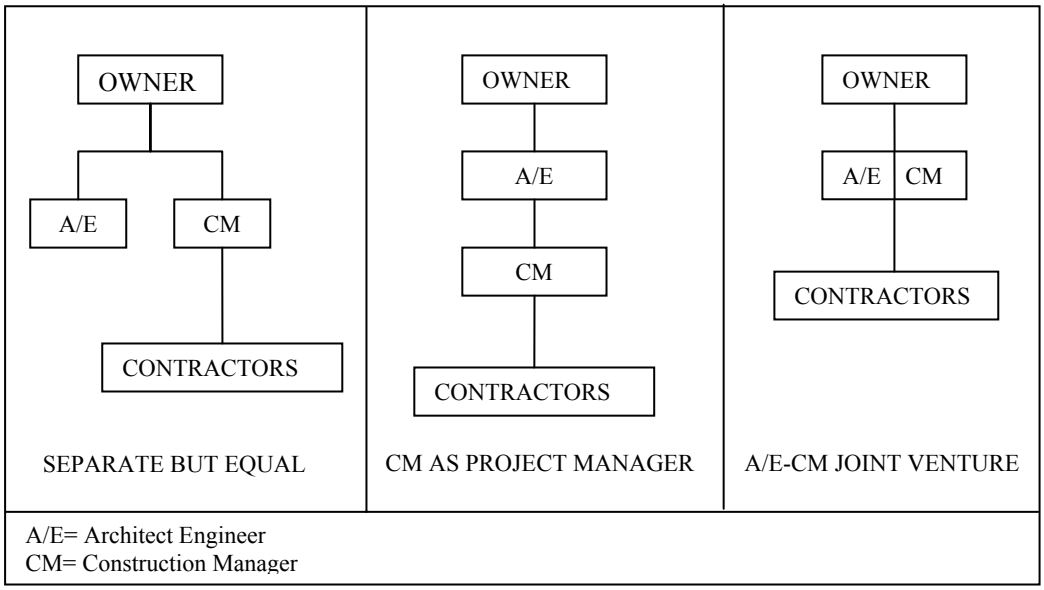


Figure 2.1. Project Organization Chart

As Kreitzberg (2000) states, the project manager is the key to a successful organization, for he is responsible for the overall aspects of a project. The project manager must provide connection between the field staff, architect and the Employer, and at the same time control all cost, schedule and contractual aspects of the project. In turn, the project manager places a great deal of dependence upon the field superintendent, who is responsible for all activities at the project site. The performance of these two individuals is essential to a successful project. To a large degree, it is the project manager and the field superintendent who are the key to an effective contract-administration relationship with the Employer (Shively, 2000).

The project manager and his team are responsible for all the administrative functions necessary to support the field superintendent. This includes ensuring an adequate supply of labour, materials, subcontract services, equipment and site

services. In addition, the project manager is responsible for: processing of all general correspondence, assuming timely submittal of shop drawings, obtaining clarification of project documents, supervising subcontractor and major equipment buy-outs, scheduling and attending meetings with the Architect and Employer, checking and approving subcontractor requisitions, resolving disputes with the Employer or subcontractors, preparing and reviewing progress payment requests, negotiating all cost and schedule matters with the Employer, Architect, and subcontractors (Kreitzberg, 2000).

Kreitzberg (2000) believes that the field superintendent must be kept current of all contract changes in order to ensure timely completion of the project in accordance with the plans and specifications. His knowledge of construction is extremely important since he must ensure that the work performed in the field is in compliance with drawings and other project documents. He is primarily responsible for providing daily on job field supervision of the building trades, coordination of subcontractors and quality control. Included in his duties are; providing field engineering and layout, scheduling resources and labor, controlling the quality of construction and reviewing schedules.

### 2.2. Contract Relationships

The contract relationship is between the Employer, general Contractor, Engineer and the subcontractor. The subcontractor is under the responsibility of the general Contractor, not the Employer or the Engineer. Basically, it is the general Contractor's decision whether or not to use subcontractors. The general Contractor must be concerned with performing in accordance with the Employer's contract (often as defined by the Engineer) as well as the performance by his subcontractors. This requires an administrative capability to assure compliance with the Employer's requirements and performance by his subcontractors. As Chan (2003) states, the construction industry is faced with several problems, such as lack of cooperation, limited trust, and ineffective communications leading to an adversarial relationship among all project

stakeholders. This kind of relationship is reflected in project delays, difficulty in resolving claims, cost overruns and litigation.

Shively (2000) state that for the Employer-Contractor relationship to be successful, well defined agreements or contracts need to be in place. These contracts need to define the duties and responsibilities as well as the authority of each party. These contracts are usually administered by the Employer's agent, who is responsible for ensuring that the performance of all parties involved is in accordance with the contract documents. According to Chan (2003), parties involved must have mutual trust toward other partners. They should have the belief that others are reliable in fulfilling their obligations in an exchange relationship. It is essential to ''open'' the boundaries of the relationship because it can relieve stress and enhance adaptability, information exchange, joint problem solving, and promise better outcomes.

According to Kreitzberg (2000), there are two aspects to the relationship between the Employer and Contractor. The first and highest is the legal aspect of the relationship. The contractual agreement between the two parties must be fair and clearly understood by both. The second aspect involves the day-to-day working relationship of the parties. It should be close enough so that the Employer is kept within all aspects of the project and is able to respond quickly to the Contractor's questions. Shively (2000) believes that the Contractor must be concerned with:

- Performing all work in accordance with the Employer's contract, drawings and specifications, which are often defined by the Architect-Engineer.

- Overseeing the performance of his subcontractors to ensure that they are also in compliance with the Employer's requirement. This requires technical as well as administrative skill.

Different groups of contracting parties, as well as different members of individual groups, interpret contract clauses differently (Rahman and

Kumaraswamy, 2004b). A clear meeting of minds of the different parties appears necessary. Given the nature of the present construction industry as a very complex, high-risk, multiparty business, conflicts between the diverse participants need to be minimized through better relationships and cooperative teamwork and under flexible contract conditions (Dissanayaka and Kumaraswamy, 1999). Relational contracting (RC) principles may be mobilized to provide such contractual flexibility, improve relationships, and build team working (Rahman and Kumaraswamy, 2004b).

### 2.2.1. Relational Contracting

RC considers a contract to be a relationship among the parties, encourage long-term provisions, and introduces a degree of flexibility into the contract, on the basis of understanding each other's objectives (Rahman and Kumaraswamy, 2004a). More relational and performance-oriented (rather than purely price-based) Contractor selection would also encourage an amicable RC environment, more collaborative teamwork, and higher productivity. These concepts may be extended throughout the supply chain (1) to build a single project team, and (2) to target optimal project performance.

Rahman and Kumaraswamy (2004b) develop some general trends toward adoption of RC in the construction industry and the best ways of forming a project team (comprising Consultant, Contractor, Subcontractor, Supplier, and Owner). These include the following:

- Consultants should have a mixture of both hard/technical and soft/relational factors to select among for an RC approach, with less importance placed on price.
- To be selected for the team, Contractors must have very high capabilities in terms of trust and business ethics and open communication and understanding each other's objectives.

- Both consultants and Contractors should be appointed before the construction contract award, and mostly at earlier stages of the project.
- Both Subcontractors and Suppliers should be mobilized before the contract award, depending on the nature of the projects.
- Trust and business ethics-related factors are seen to be more conducive factors for building a relational contract.

Lyons and Mehta (1997) describe RC that provides the means to sustain ongoing relations in long and complex contracts by adjustment processes of a more thoroughly transaction-specific, ongoing, administrative kind. This may or may not include an original agreement, and if it does, the need for the contract may be of less importance. RC considers contracts as promises of doing something in the future, but not all events can be foreseen (discerned or realized), and as all the information needed cannot be perceived completely (collected or measured or quantified) at the time of contracting, mutual future planning is required. This may well give rise to "opportunism" that benefits one party at the expense of other(s) and needs trust and trustworthy behavior among the parties.

According to these RC principles, parties do not strictly adhere to the legal mechanisms provided in specific contracts, but instead operate from a dynamic standpoint within a collective framework of contractual, economic, and behavioral forces. Relationships between the parties are therefore important, particularly in complex, lengthy, and evolving transactions where the underlying contractual scenario may change considerably over time (Rahman and Kumaraswamy, 2004a).

Rahman and Kumaraswamy (2004a) characterize RC by the subordination of legal requirements and related formal documents to informal agreements in commercial transactions, such as verbal promises, or partnering charters. This mode of governance calls upon all parties to (1) recognize the positive gains from maintaining the business relationship, (2) transcend the hostility, and (3)

overcome the uncertainties associated with unforeseen events in order to improve overall efficiency through motivation and improved attitudes.

According to Jones (2000), RC principles underpin various approaches, such as partnering, alliancing, joint venturing, long-term contracting, and other collaborative working arrangements and better risk-sharing mechanisms. RC allows mutual future planning and considers contracts to be relationships among the parties in the process of projecting exchange into the future. This requires transforming traditional relationships toward a shared culture that transcends organizational boundaries. However, the nature and extent of flexibility that may be incorporated in the standard contract conditions must be carefully controlled in order not to invite abuse, misinterpretations, and other problems that may lead to claims, disputes, and disruptions of relationships.

### 2.2.2. Partnering

Scott (2001) identified partnering as a practical example of RC principles. Partnering leads to increased returns for all parties. For the owners, it leads to a quality product at a good price with few (if any) disputes in the shortest reasonable time. For the contractors, it leads to a pleasant working atmosphere with minimum change orders and wastage, and also maximum freedom to get the job done on time at a higher profit margin (Barrington, 2001). Even on a money-losing project, the Contractor can reduce his or her loss, the Employer can get a satisfactory product, and a subcontractor can improve his or her production line with less rework if they work as a team. Partnering also provides the means for process improvement and intelligent risk sharing (Cowan, 1992).

Construction projects are typically awarded through a competitive tender process and often the lowest bid gets the job. Such selection mechanism has been heavily criticized for not providing quality services and works (Scott, 2001); in addition, it has resulted in substandard workmanship and ‘quick-buck’ attitude among Contractors. These are not only detrimental to the project programme and quality, but also hamper the relationship between the contracting parties. For this

reason, it is imperative to identify ways to prevent these from happening as 'prevention is better than cure', in fact, there are a number of industry-wide studies advocating the use of partnering in construction. Partnering as an approach to manage construction projects is attracting much public attention. It is regarded as an important management tool to improve quality and programme, to reduce confrontations between parties, thus enabling an open and non-adversarial contracting environment. To make partnering effective, it is critical to have a change in culture within the industry. This can only be achieved with the change in attitude of the project participants.

Partnering is management technique that tries to create an effective project management process between two or more organizations. It aims to generate an organizational environment of trust, open communication, and employee involvement (Chan and Tang, 2004). Project partnering could well be applied to construction projects with an encouraging record of success and can provide improved time and cost benefits to both Clients and Contractors. Partnering has been applied as a new management strategy to procuring construction projects. It is created by the parties who will be involved in the project including the Client, Consultants, main Contractor, Subcontractors, and Suppliers. It benefits all parties involved, but mutual commitment is required at all levels (CII 1996; CIB 1997).

According to Harmon (2003), the primary objective of partnering is the prevention of disputes. Partnering is a nonadversarial process that seeks to build cooperation, trust, commitment, and open communication. The partnering process encourages the contracting parties to take deliberate voluntary steps to keep the channels of communication open, identify mutual goals, and discuss methods of handling conflict prior to communicating work on a project.

Thompson and Sanders (1998) observed that benefits from a partnering-type RC approach increase with a migration of teamwork attitude from competition to

cooperation, through to collaboration and finally to integration. Essentially, integration implies all stakeholders work in a one-team spirit.

In construction, the concept of partnering is described as a generic term of management approach to align project goals (Bayliss, 2002). The goal for partnering is to improve relationships among contracting parties, either in single project partnerships or in long-term strategic alliances. The Associated General Contractors of America described it as a way in achieving an optimum relationship between a Client and a Contractor. Partnering provides benefits to the contracting parties, including cost effectiveness, work efficiency, opportunities for innovation, equitable risk sharing, and less confrontation

Successful partnering does not come naturally. Black (1999) identified that mutual trust, effective communication, commitment from senior management, clear understanding of different parties' roles, consistency of objectives, and flexibility to change are essential factors for success in partnering. However, in construction, the non-compromising tendering process, poor perceptions of the partnering process, lack of knowledge and skill to adopt partnering and non-commitment of the parties all work against the concept of partnering.

### 2.3. Types of Contracts

As Broome and Hayes (1997) remarks: "A major advantage of using a standard document is that those who use it regularly become familiar with its contents. They thus become aware of both its strengths and weaknesses, and the suitability for their own specific purposes. This reduces the number of disputes and misunderstandings and it is possible to use the contract, safe in the knowledge that what is learnt today will not be redundant tomorrow". O'Reilly (1996) states that construction contracts are the written agreements signed by the contracting parties (mainly an Employer and a Contractor), which bind them, defining relationships and obligations. In any certain project, the owner's goal can best be achieved by selecting the contract type that will most effectively motivate the

Contractor to the desired end. This step is also dependent on completeness of information for the bidder(s) at tender time and the extent that the Employer wishes to take specific risk.

Contracts shape the behavior of the parties involved and thus have a major impact on project success. The type of contract administration required by the Employer and general Contractor depends largely on the type of contract in effect and whether the Employer is a public agency, a public corporation, or a private developer. Kreitzberg (2000) identifies most construction contracts today that fall into one of these four broad categories:

1. Lump sum or fixed price contracts
2. Guaranteed price contracts
3. Cost plus construction contracts
4. Unit price contracts

### 2.3.1. Lump Sum Contract or Fixed Price Contract

A lump sum contract specifies that the Employer will pay the Contractor a fixed sum of money for the completion of a definite described and fixed amount of work. This type of contract is used where the plans and specifications are complete and the scope of work is readily defined. The sum is usually based on the Contractor's low bid, which was developed utilizing the plans and specifications. This type of contract provides little cost risk to the Employer and shifts the risk of performance to the Contractor. For this reason, public agencies tend to prefer the lump sum type contract. It is extremely important that the plans and specifications given to the Contractor by the Employer be as complete as possible. The general Contractor compiles and analyzes the estimates and subcontractor bids for the various aspects of the work with careful consideration to both quality and cost before the final estimate and proposal are prepared. It is obviously important for the Contractor to maintain a capability to prepare specific and accurate payment vouchers. To accomplish this, he must have a person on the jobsite capable of defining the materials utilized, labour expended,

and other resources committed to compile an accurate record demonstrating the amount of work in place extended in terms of the proportionate share of the total contract cost (Kreitzberg, 2000).

### 2.3.2. Guaranteed Price Contracts

This type of contract, which is most commonly used by private Employers, is the same as the lump sum contract, except that the Contractor accepts the responsibility to complete the work for the estimate cost even if there are minor changes caused by errors and omissions, unless extras are requested by the Employer. Significant in this type of contract is the Contractor's guarantee of total cost. It provides the least risk to the Employer and the greatest risk to the Contractor because the Contractor accepts part of the design responsibility for minor changes within a fixed price. In most cases it is agreed that Contractor will share or participate in any savings at a percentage agreed upon between the parties during contract negotiations. Since the Employer and the Contractor both can benefit from efficient performance of the job, it often requires the Contractor to establish the capability on his job to analyze the performance of the work continually and establish cost tradeoffs for the purposes of producing minimum costs (Shively, 2000).

### 2.3.3.Cost Plus Construction Contracts

The 'cost' element of the cost plus construction contract refers to reimbursable labour, material and other items. The plus element refers to the Contractor fee for performing the work contracted for. Cost plus contract are especially effective when the scope of work is unknown or hard to define, such as when an Employer requires that work be started very early without a full set of design documents and specifies that the timely completion of the project is critical. It is possible, under this type of contract, to start work with nothing more than a preliminary set of drawings and outline of specifications and to develop a working budget in conjunction with the Engineer. Cost plus contracts are usually used wherever competitive bids of lump sum or other types are impractical because of

unpredictable physical conditions, unstable labour and material markets, or an undefined or very poorly defined project scope. Staying within the budget under a cost-plus contract depends on cooperation among the Engineer, the Employer and the Contractor. It requires continual consideration and evaluation of cost alternatives throughout the project. Record keeping by the general Contractor becomes extremely critical because records are the basis for reimbursement of costs to the Contractor and because the Employer often has to the right to audit the project records (Kreitzberg, 2000).

### 2.3.4. Unit Price Contracts

Kreitzberg (2000) states that this type of contract is used where certain operations or services are to be performed repetitively or definite units of physical items of certain quality are to be provided and can be measured in some manner of units but the final quantities to be provided are indefinite. The unit price construction contract can be used when the total quantity is fixed or definite but is most useful when the total quantity is not readily defined. The unit price is readily applicable to such construction work as excavation lines, transmission lines, road work, etc. Such work can be measured by units such as foot, yard, square yard, cubic foot, ton, and gallon, etc.

Apart from convertional relation between Employer and the Contractor, on certain large or complex projects, the Employer may decide to contract with a nationally known Contractor, Construction Manager, and Consultant who, acting as the Employer's agent, manages the overall project and provides coordination and representation for the Employer in the field. The Employer usually uses one of the previously mentioned contractual forms for actual performance of the project (Kreitzberg, 2000). This approach affords the Employer the services of an experienced, well-established firm at a nominal cost and maintains all the advantages of a bid type contract. With this type of contract, the Construction Management Consultant must be assured of the confidence of the Employer and the major contractors. According to Shively (2000), in this type of contract, from

an administration standpoint, it is extremely important that the Construction Management Contractor be qualified and has a high degree of confidence from the Employer and, from the implementing contracts. If this is not the case, it is quite obvious that from a contract administration standpoint, there would be a great deal of redundancy in record keeping and reporting. The real advantage of construction management for the owner is the reduction of owner responsibilities through trust that the consultant will maintain control of the entire project.

### 2.4. Contract Components

Construction risks are often project specific and are allocated to different parties through contract conditions (Rahman and Kumaraswamy, 2004b). Assaf and Naji (2000) believe that unbalanced risk allocation in contract provisions, adversarial relationships between project participants, together with the traditional client–contractor mentality have long been identified as the major source of construction problems. According to Piper (2001) contract provisions are so designed to favor the clients, while leaving all the burdens on Contractors. Furthermore, contract provisions are often rigidly interpreted without taking into account the parties' needs and construction difficulties.

All construction projects involve risk and there is no possibility to eliminate all the risks associated with a specific project. All that can be done is to regulate the risk allocated to different parties and then to properly manage the risk. This can be done through the language of the construction contract. According to Broome and Hayes (1997), clarity in a contract can be achieved by:

- using simple and commonly occurring language;
- using identical phrases where possible;
- excluding contract specific data so that there is no need to change, delete or add to the core conditions of contract;
- setting out duties and responsibilities clearly and precisely, using engineering terminology common to all disciplines wherever possible;

- not attempting to paraphrase existing law;
- settling for clarity above fairness in minor matters which would involve complicated text; and
- omitting matters which are more effectively covered in the technical specification.

As Branconi and Loch (2004) states, specifications, price (quality of cost estimates), schedule, payment terms, performance guarantees, warranties, limitations of liability, and securities must be well defined in the contract: they specify the basic content of the deal (specifications with performance guarantees, price-basis, terms of payment and schedule), and give assurances for both sides (securities, warranties, liquidated damages, and limitations of liability). Figure 2.2 illustrates the eight key business levers and details of eight key business levers in the contract that the contract must settle are given in the following sections.

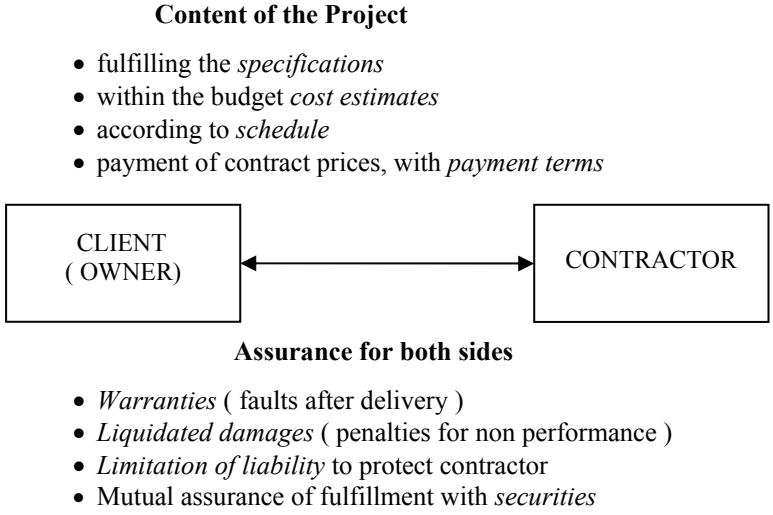


Figure 2.2. The eight key business levers in contract (Branconi and Loch, 2004)

### 2.4.1. Technical Specifications

The Client defines the technical basis of his project including future operation and maintenance, fundamentally determining his financial return in the long run. The quality of the specifications includes: adequacy and completeness, consistency between the technical and commercial part of annexes, and the clarity of scope, deadlines and the client's deliverables. The clarity of the specifications documentation will heavily determine future change orders or claims, as it defines what is a changed requirement (Branconi and Loch, 2004). Barnes (1994) states that contracts, codes, standards and regulations could use the language and forms best suited to construction. They could make clear in various ways that they are intended as practical guides to achieve the purposes of design and construction, and that intention is to be given paramount importance in their interpretation.

### 2.4.2. Price (quality of cost estimates)

According to Branconi and Loch (2004), the price and the quality of the underlying cost estimates should be perfectly consistent with the technical specifications, including an adequate cost contingency. The Client should avoid to always go for the lowest bid. Purely price-based selection strategies entice tenderness to lower their bids to win contracts, relying on subsequent claims to recover their costs (Kumaraswamy, 1997). It may reflect that the Contractor (a) has not sufficiently understood the requirements, (b) is applying less well-suited technology or equipment, or (c) wants to lock-in the contract and then make money by filing change orders. The Client must verify (himself or through a third party) major assumptions of the Contractor. Contractor usually finds ways to press change claims or to sacrifice quality although the Employer attempts to bind the Contractor to the contract.

### 2.4.3. Payment Terms

It is used to provide an agreed upon and equitable basis for future payments. The sum of values of all work activities corresponds to the Contractor's bid price. Requests for progress payments by the Contractor are based on the percentage completion of work activities and their corresponding values (Kreitzberg, 2000). Payment terms determines to what extent cash receipts by the Contractor cover his cash expenses over the course of the project, defining the Contractor's exposure from cash flow during the project. Contractors mostly receive a 5–15% down payment, allowing them to start the job. Intermediate payments allow equipment delivery, as Contractors rarely have the cash flows to pre-finance their suppliers. The final 5–10% payments are critical. They are frequently tied to mechanical and/or final completion and to passing performance tests and enable the Employer to exercise maximum pressure on the Contractor. It can happen that, the Client, already successfully operating the facility, comes up with formal arguments or minor lists to keep the money. Contractors should seek contractual terms (although never easy to implement) to protect themselves, as their existence may be at stake (Branconi and Loch, 2004).

### 2.4.4. Schedule

Branconi and Loch (2004) states that consistency in the definition of the key milestones (mechanical completion, function test, cold commissioning and hot commissioning) are vital to smooth project implementation. There has been a recent tendency to compress project schedules in order to improve the clients' project returns. This causes any execution delay to pose a trade-off for the Contractor: he will have to spend money on acceleration or on liquidated damages for not meeting final due dates. Contractor and Employer should be explicitly aware of these trade-offs and incentive effects, as the Contractor may completely stop exerting effort after a significant delay (and accrued liquidated damages), and both sides may lose in the end.

### 2.4.5. Performance Guarantees

The Contractor has to prove that the delivered facility functions in accordance with defined parameters, typically within ranges (except where specified by law, e.g., environmental regulations). If the performance is not fulfilled, costly liquidated damages may set in. Problems occur if performance aspects or conditions for achieving the performance are not explicitly defined. A typical example is the definition of the raw materials to be supplied by the client. In particular, input materials that are based on natural resources may vary significantly from defined in the contract. This may seriously impact plant performance after the contractor has fulfilled his obligations, leading to conflicts (Branconi and Loch, 2004).

### 2.4.6. Warranties

Warranties secure the contracted performance of equipment and services for a limited period, typically between 12 and 24 months. The Contractor has to make sure that the facility operates correctly at least over the warranty period. The triggering of a warranty claim becomes tricky once the client has assumed operation of the facility, whose operation errors may lead to warranty claims that are not justified. As Branconi and Loch (2004) states, while clients need to pay attention to complete warranty coverage, Contractors should be aware of two dangerous complications. First, the warranty should specify whether it includes only re-performance of services or also the replacement of the equipment. Moreover, chain warranties may arise when the warranty period is re-started by a claim. If further parts fail during the re-started period, the warranty may ‘‘propagate’’ from one part to a whole plant section. Second, among packages with multiple interfaces, a warranty may be triggered by a supplier package. In this case, it is virtually impossible for the main Contractor to claim back from the supplier all the costs incurred in solving the client’s (system) problem. In spite of modern quality assurance methods, the continuous monitoring of the key suppliers’ design and manufacturing progress remains vital.

### 2.4.7. Limitations of Liability

According to Branconi and Loch (2004), while liquidated damages and warranties protect the Client, a contractual limitation of liability protects the Contractor by specifying a maximum level of exposure. In practice, limitations vary from 5 to 10% of the contract value all the way to the full value. With margins of about 5%, an exposure of the full value may endanger the Contractor's existence, and he should exclude all indirect and consequential damages as well as any other rights and remedies except those explicitly stated in the contract.

### 2.4.8. Securities

Clients often require financial securities (e.g., bonds or bank guarantees covering the contract life-time including the warranty period) from the Contractor. A security can reach 25% of the contract value, a dangerous exposure for a medium size Contractor. Contractors, in turn, often insist on payment securities from the Client (e.g. a secured letter of credit) for two reasons. First, the Contractor may encounter additional financial exposure arising from payments and commitments to his suppliers. Second, legal enforcement possibilities are limited; however, the Contractor's means to execute a security, drawing money from a Client, are often limited compared to the enforcing possibilities of a Client (Branconi and Loch, 2004).

## 2.5. Administration Tools

The project manager and the field superintendent rely to a great degree upon certain administrative tools in the execution of their jobs. Although each Contractor approaches this problem in a slightly different manner, Kreitzberg (2000) identified the basic administration tools including complete project documentation, comprehensive and accurate cost records and realistic schedules. The following sections explain how these basic administration tools are carried

out by the Contractor and how changes in scope of the project are managed by the contractor.

### 2.5.1. Project Documentation

The project manager and staff should maintain a formal filing system of contemporaneous project documentation. According to Kreitzberg (2000), documentation systems can vary according to project requirements but should contain project files and job-site logs.

*Project files* is an organized central filing system is essential to any well-run project. The larger and more complex the project, the greater the need for an organized filing system (Shively, 2000).

*Job-site logs* are essentially daily diaries of the events of a given day or shift. The logs would record the date and time of any significant events (e.g. material deliveries, subcontractor start dates, when questions requiring answers are submitted to the owner, etc.). These logs are valuable if each individual religiously maintains his own log and all information is recorded in a consistent manner (Kreitzberg, 2000).

The need for documentation on a project usually depends on the size of the project, its complexity, the reputation of the parties involved, and the Contractor's personal preference. During the course of a project, the amount of paperwork can seem unduly burdensome and unnecessary; however, should disputes and claims arise, their value will become apparent by the man-hours and money saved.

### 2.5.2. Cost Records

Shively (2000) believes that cost records are maintained in a number of ways. However, one of their basic functions is the generation of useful records on a cost account basis. Cost records should show the continuous development of construction or project costs. Actual construction costs should be compared with

the estimated amount prepared as the part of the original budget estimate. The primary objective of any cost accounting approach is to establish a timely, accurate picture of actual job expenditures versus estimated job expenditure as construction moves ahead. These data will allow the project manager to take appropriate corrective actions. The data will also be valuable in preparing future estimates and bids.

It is the responsibility of the administration department that may be in charge of the Contractor's cost control program, to determine how the money is spent, the quantity of work performed for the expenditure, and the reasonableness of the outlay. Unfortunately, as Kreitzberg (2000) states, no amount of cost engineering can overcome losses due to adverse weather, low bid, or unanticipated price rises. Neither can cost control retrieve money already dissipated through inefficient management or poor supervision. However, cost control does unable the Contractor to analyze his field methods and measure the performance of his labour and equipment. It affords the Contractor a rational basis on which to base his selection of equipment and methods. It makes it possible for him to determine quantitatively the maximum rates of production he can expect from his men and machines.

### 2.5.3. Schedule

The other vital administrative tool required by the Contractor is a program for realistic and current scheduling. In order for the Contractor to achieve his contractual completion date, he must have at his disposal a scheduling system which ensures that every item of construction starts at a predetermined time and proceeds smoothly and efficiently. This scheduling system can be reviewed in comparison with other activities, and is completed when expected (Kreitzberg, 2000). To be truly effective the Contractor's scheduling system must be comprehensive and include all phases of his responsibility including availability of plans and specifications, site information and accessibility, securing of necessary permits, interfacing with other contracting or owner activities,

purchase and delivery of materials and subcontractors, and the specific steps required in the performance of his construction tasks (Shively, 2000).

### 2.5.4. Scope Control

The original contract between the Employer and the Contractor specifies a particular quantity of work defined by plans and specifications for which the contract is responsible. From time to time, the Employer may request the Contractor to perform extra work. There may be reason for the Contractor to seek additional compensation for the performance of work not included in the original plans and specifications and thus not covered by the Contractor's estimate and bid. According to Shively (2000), these changes may arise where the Contractor may discover omissions by the Employer or the Engineer which will necessitate that additional work be performed. When this situation arises, a change to the original contract, or a change order, is initiated.

Contract law has always permitted the parties to a contract to modify it by mutual consent. Since a change order is a modification of the original contract, it cannot be unilaterally issued and approved. As Kreitzberg (2000) states, in construction contracts, change orders must be agreed to by both the Employer and the Contractor. Because of the almost universal need for Employers to be able to incorporate changes in a contract, it has become common practice for Employers to include a change clause to allow them to make necessary changes in the Contractor's scope of work.

A constructive change may result from words, acts, or omissions by the Employer or his agents which are constructed by the Contractor to have the same effect as if a formal, written change order has been issued. This could involve something as simple as work that is rejected as not meeting contract requirements when in fact the work do comply with contract requirements. Nevertheless, the Contractor incurs additional expenses correcting defects and deficiencies or the Contractor is required to perform extra work result from a formal change being issued by the Owner but does not allow a reasonable

schedule extension for the extra work. The Contractor would be forced to pay additional overtime to accelerate the work to meet the Employer's schedule requirements. In either case the project manager should document the circumstances and attempt to have the Employer agree to the changes in writing (Kreitzberg, 2000).

When responding to requests by the Employer to perform additional work, it is compulsory for the project manager to ensure that the scope of the change is clearly defined so that the Employer can be given an estimate of the additional costs that will be incurred and the additional time that will be required. The Employer must approve the extra changes or schedule extensions before they become part of the contract.

Shively (2000) believes that changes are an inevitable part of the construction process. It is important for the Contractor to document all changes to the contract documents and additions to the scope of the project. If there are questions concerning either the plans or specifications, it is the project manager's obligation to obtain clarification. Changes to scope can result in additional project costs or schedule extensions. It is important for the project manager to identify these additional costs and schedule extensions at the time they occur rather than at the project's completion. It is best to resolve disputes as they occur rather than after the project has long been completed, but in the absence of timely dispute resolution, proper documentation is essential to effective contract administration.

Although changes are usually dealt with through the administrative provisions of the contract, a large number of changes can have a cumulative and disruptive effect on work performance, frequently referred to as the ripple effect. Such changes may lead to claims for damages for breach of contract or to the Contractor terminating the contract.

## 2.6. Conflicts and Claims

Conflicts are present on all construction projects and, if left unresolved, can have detrimental effects on the progress of the project as well as the relationships between the contractual parties. Conflicts are caused by the size and duration of the project, the complexity of the contract documents, wrongful termination of contract, improper rejection of installed work, changed conditions, poor communication, limited resources, financial issues, inadequate design, labour issues, and force major events. Because of these conflicts, the construction industry is plagued by an increasingly adversarial atmosphere existing between the Employer and the Contractor (Harmon, 2003).

Construction is a collaborative teamwork process with successful projects dependent upon a strong weave of Employer, Architect, Engineer, Contractor, and Supplier. As emphasized by Kreitzberg (2000), when individuals within that society do not work together toward a common goal, then conflicts, which are a part of every construction process, evolve into unresolved disputes, preventing the successful and timely completion of the project. The resolution of conflicts on construction projects can be accomplished under certain conditions. These conditions are based on shared relationships and past experiences the parties have had with each other. Failed attempts to resolve a dispute often strengthen the party's adversarial positions and are always counterproductive. As Harmon (2003) states, if conflicts continue to be unresolved, they will affect the progress of the project. The timely resolution of disputes will provide more satisfaction to both parties and will therefore not adversely affect job progress.

A construction claim is a request that is usually originated by the Contractor for additional compensation for work related to a matter or event that the Contractor considers to be outside the scope of the contract and not recognized by the Engineer as a change or extra work (Kreitzberg, 2000). The general Contractor has to duty to screen claims from subcontractors and to check that the Employer

is contractually responsible for the cost and that the amount claimed is reasonable.

It can be concluded that since the construction industry is so risky and the profits on projects often slim, project risk management should be handled properly and be placed on how to identify and manage risk before, rather than after, they materialize in losses or claims. Therefore concepts related to the project risk management are given in the next chapter.

# CHAPTER 3

# PROJECT RISK MANAGEMENT

Construction, like many other industries in a free enterprise system, has sizeable risk built into its profit structure. From beginning to end, the construction process is complex and characterized by many uncertainties. The construction industry, perhaps more than most, is plagued by risk (Flanagan and Norman, 1993). Risk is an unavoidable part of project management and many organizations have to rethink their approach to the ways in which risks are treated within their projects and companies (Tah and Carr, 2000).

Many Contractors, however, have developed a systematic approach and rules of thumb when dealing with risk. These rules generally rely on the Contractor's experience and judgment. As Baloi and Price (2003) remark: "Risk management relies heavily on experience, subjectivity and human judgment". Rarely do Contractors quantify uncertainty and systematically assess the risks involved in a project. Furthermore, even, if they assess these risks, they even less frequently evaluate the consequences associated with these risks. One reason might be lack of a rational straightforward way to combine all the facets of risk systematically into a prioritized and manageable scheme (Al-Bahar and Crandall, 1990).

The risk management process is continuous systematic cycle that consists of risk analysis, strategy implementation and monitoring. Risk management is beneficial if implemented in a systematic manner from the planning stage through project completion. The unsystematic and arbitrary management of risks can endanger the success of the project since most risks are very dynamic throughout the project lifetime (Baloi and Price, 2003).

The objective of this chapter is to examine project risk management in construction industry. Firstly, definition of risk will be given. Then, steps of building construction risk management system (CRMS) will be mentioned in an effective systematic framework. CRMS has five processes namely; risk management planning, risk identification, risk analysis and evaluation, response management and monitoring (Tah and Carr, 2000). These processes will be explained in detail in the following sections. Finally, risk allocation between Employer and Contractor will be highlighted and specific examples will be explored.

### 3.1. Definition of Risk

In the literature, the word "risk" is defined as "The exposure to the change of occurrences of events adversely or favorably affecting project objectives as a consequence of uncertainty". The Oxford Advanced Learner's Dictionary (1995) defines risk as the: ''chance of failure or the possibility of meeting danger or of suffering harm or loss''. According to Al-Bahar and Crandall (1990), most definitions of risk have focused only on the downside associated with risks such as losses or damages, and neglected the upside or opportunity such as profit or gains. With this definition, risk is characterized by the following components.

*The uncertainty of the event:* How likely the event is to occur, the change of the event occurring. A certain event does not create risk, although it may create gain or loss.

*Potential loss/gain:* It is necessary that there should be some amount of loss or gain involved in occurring of the event, i.e. a consequence of the event happening. "Loss" is used as a general term to include personal injury or physical damage, and "gain" to include profit and benefit.

It is necessary to understand the nature of risk before any knowledgeable management of risk can occur. Risk comes in many forms, and often the nature

of risk depends on the situation (Al-Bahar and Crandall, 1990). Risks occur when:

- An event is certain to happen, but outcome of the event is uncertain.
- The outcome of an event is certain, but the occurrence of the event is uncertain.
- The occurrence and the outcome are both uncertain.

### 3.2. Construction Risk Management System

As Price and Baloi (2003) state, in construction projects, risk may be defined as the likelihood of a detrimental event occurring to the project. Since the objectives of construction projects are usually stated as targets established for function, cost, time and quality, the most important risks in construction are the failure to meet these targets. Wang and Chou (2003) believe that risks cause cost overrun and schedule delay in many projects. It is clear that the success of a project is dependent on the extent to which the risks that affect it can be measured, understood, reported, communicated and allocated accordingly (Tah and Carr, 2000). The effectiveness of risk management becomes an important issue in project management.

As emphasized by Tah and Carr (2000), risk management has been carried out in many fields for a number of decades. The idea that identifying problem areas within a plan or a project will help in the formation of a strategy, and the success or failure of many projects will often be determined by the efficiency with which the level of risk affecting them is dealt with.

Construction risk management system is a process comprising the following five main steps: risk management planning, risk identification, risk analysis and evaluation, response management and monitoring (Tah and Carr, 2000). CRMS provides an effective systematic framework for quantitavely identifying,

evaluating and responding to risk in construction projects (Al-Bahar and Crandall, 1990). The phases and actions of risk cycle is shown in Figure 3.1.

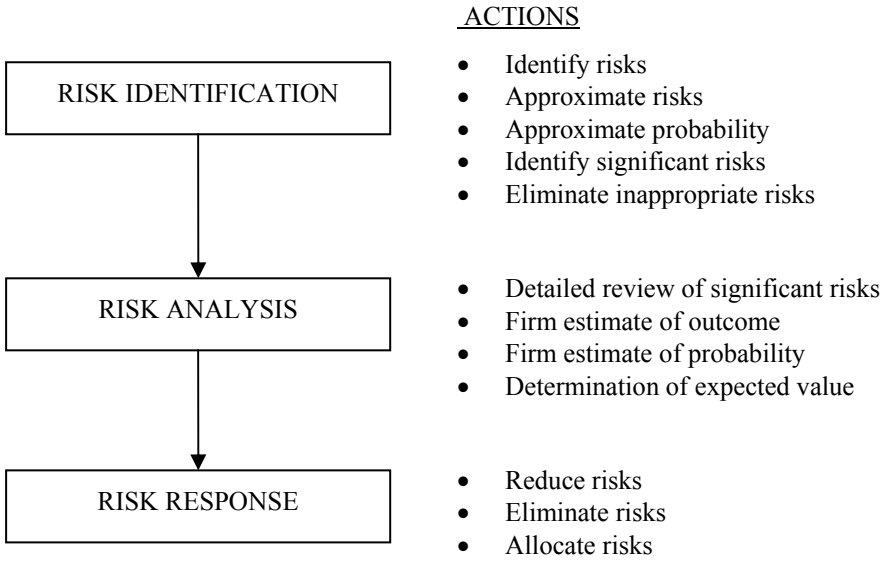


Figure 3.1. Risk Cycle Phase (Al-Bahar and Crandall, 1990)

### 3.2.1. Risk Management Planning

Risk management planning is the first process of the CRMS model and it consists of four stages: requirements, project, process and team. Before explaining risk identification process, these four stages will be covered in detail.

#### *3.2.1.1. Requirement Stage*

The requirements stage starts the risk management process between the staff with the greatest levels of responsibility for it and the most senior among the Clients for whom the work is to be carried out. The first step is to obtain the minimum of information about the main features of the project from the Client of the process. At this point, this step will be taken without great contrasts, so that the coherence between these features and the project objectives is analyzed in only a cursory fashion. The next step is to obtain basic information from the Client about their risk management needs. Risk management team will make

interview with the Client about all stakeholders and interested parties in the process; the profit or benefit they hope to gain and other motivations in the process; the desired process scope; time scale available; the assigned budget for the process; and finally, prioritization of the process objectives. The main goal of this stage is to avoid wasting time in the following stages of this phase, in case of a mismatch between the needs of the process Clients and their own restrictions or those emerging from the project itself (Cano and Cruz, 2002).

*3.2.1.2. Project Stage*

According to Kangari (1995), the project stage entails a detailed study of the project and a definition of how the project's success will be measured. The first step is familiarization with the project and an analysis of it as far as risk management is concerned. This consists, first, of gathering and summarizing any existing information about the project. Risk management team's goal is to suggest possible changes in the project and to produce formal documentation for this stage. The second step is to contrast the project objectives, comparing all the information collected up to this point to decide if everything goes forward or if the project requires serious reconsideration. Finally, the way in which project success will be monitored, and even measured, must be established.

*3.2.1.3. Process Stage*

Cano and Cruz (2002) define the process stage as an analysis of the feasibility of the risk management process and its planning. The aim of this stage is to analyze the feasibility of the process. This entails:

- Reconsideration of the information about the stakeholders and interested parties and the advantages (profit, benefit) they hope to gain from the process;
- Gathering and summarizing information about stakeholders' risk tolerances, the organization's risk management policies, and existing PRM procedures;

- Analysis of risks inherent to the project to determine which risks can be handled within the project's framework and which should be dealt with by outsiders;

*3.2.1.4. Team Stage*

In the team stage, the definitive team will be formed to deal with the remaining phases of the process. First, it is necessary to identify the key players in the process: not only those who are active on the risk management team, but also anyone else who can offer information for this process (designers, users, maintenance personnel, and so on). Moreover, roles and responsibilities must be identified. The next step includes communicating the results of the risk management planning phase and identifying outside resource needs, selecting and setting up the team, contracting external resources and designating roles and responsibilities. Finally, one should identify and resolve the training and integration needs of the established team (PMI, 2000).

### 3.2.2. Risk Identification

It is of considerable importance since the process of risk analysis and response management may only be performed on identified potential risks. There is no way that a risk can be assessed, analyzed, or controlled if it has not been identified in the first place. Additionally, the inter-relationships between the risks and the classification of the risks will need to be identified (Tah and Carr, 2001). Therefore, the process must involve an investigation into all possible potential sources of project risks and their potential consequences. As shown in Figure 3.2, there are four steps involved in the risk identification process (Al-Bahar and Crandall, 1990). The following sections will discuss each step separately.

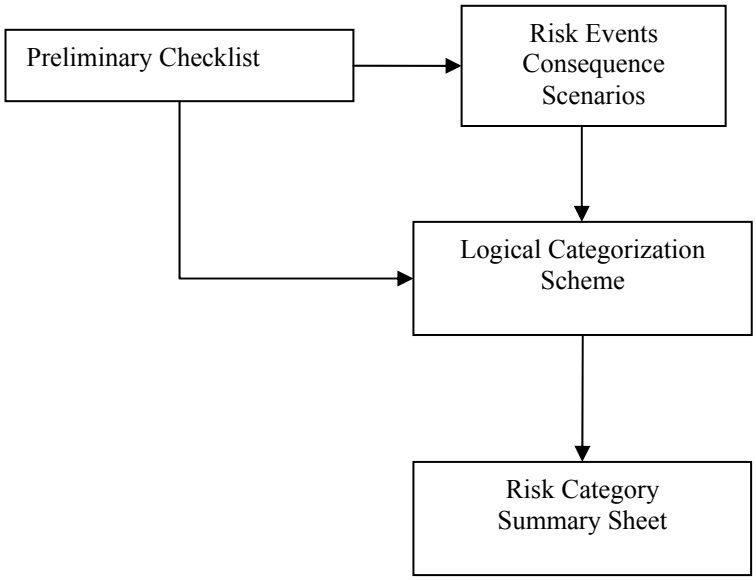


Figure 3.2. Risk Identification Phase (Al-Bahar and Crandall, 1990)

*3.2.2.1. Preliminary Checklist*

The preliminary checklist of potential project risks is the starting point for identifying risk. A failure to recognize the existence of one or more potential risks may result in a disaster of foregoing an opportunity for gain resulting from proper corrective action. Al-Bahar and Crandall (1990) believe that many Contractors utilize commercial checklists or survey questionnaires, in addition to their own past experience, to assist in preparing their checklist of potential risks. These checklists can be used as a guide or starting point for the development of a more accurate and precise checklist for the specific project in hand.

*3.2.2.2. Identify Risk Events/ Consequence Scenarios*

The second step of the risk identification process is the definition of a set of credible risk events/consequence scenarios. This set represents all reasonable possibilities associated with the sources of risk included in the preliminary checklist. The consequences can include economic gain/loss, personal injury, physical damage, time and cost saving/overrun (Al-Bahar and Crandall, 1990)

*3.2.2.3. Risk Classification*

The purpose classification of risks is twofold: first, to expand the Contractor's awareness about the risk involved. Second, it is needed to classify risks because the strategies a Contractor adopts to mitigate risks will vary according to their nature. Al-Bahar and Crandall (1990) believe that a logical and formal classification scheme of risk enables a fuller appreciation of the factors influencing the risk, consequences and different parties involved. The proposed classification scheme is composed of eight risk categories. The selected categories illustrate the diversity of risks and provide a stimulus to examine the full breadth of exposure to risk so that contractors do not focus on one type and forget others. Table 3.1 shows that the list categories and some of the typical risks in every risk category (Smith and Bohn, 1999).

Table 3.1. Proposed Classification Scheme (Smith and Bohn, 1999)

| Risk Category | Typical Risks |
|---|---|
| Natural Risks | Acts of God, loss due to fire or accident |
| Design Risks | Scope changes, new technology, specifications |
| Logistics Risks | Loss or delay due damaged or late materials, site access |
| Financial Risks | Inadequate cash flow, cost overruns due to schedule delay, exchange rate |
| Legal and Regulatory Risks | Third party liability, problems with permits and licenses, contractual failure |
| Political Risks | Loss or delay due to war, change in trade laws |
| Construction Risks | Poor productivity, inclement weather, poor site safety, labour strikes |
| Environmental Risks | Ecological damage, pollution |

*3.2.2.4. Risk Category Summary Sheet*

This is the final step in risk identification process. The summary sheet will integrate the participation of all personnel involved in the project management team. As information changes or different risk exposure develops, the summary sheet is updated. In this way, it becomes a living picture of management's understanding of the project risks (Al-Bahar and Crandall, 1990). Figure 3.3 shows an example of a summary sheet where the conditional risk variables provide insight into the interaction of one event with other listed event.

| | | |
|---|---|---|
| Name pf project: ……<br>Comments:……<br>Date: ……<br>Prepared by: …….. | | |
| Risk Events | Description of Risk Event | Conditional Risk Variables |
| **1. …….**<br>**2. …….** | | |

Figure 3.3. Risk Category Summary Sheet (Al-Bahar and Crandall, 1990)

## 3.2.3. Risk Analysis and Evaluation Process

The risk analysis and evaluation process is vital link between systematic identification of risks and rational management of the significant ones. It forms the foundations for decision making between different management strategies. According to Tah and Carr (2000), the aim of the process is to calculate the effects of the risks on the tasks, the project and the organization. Figure 3.4 is a schematic presentation of the risk analysis and evaluation process.

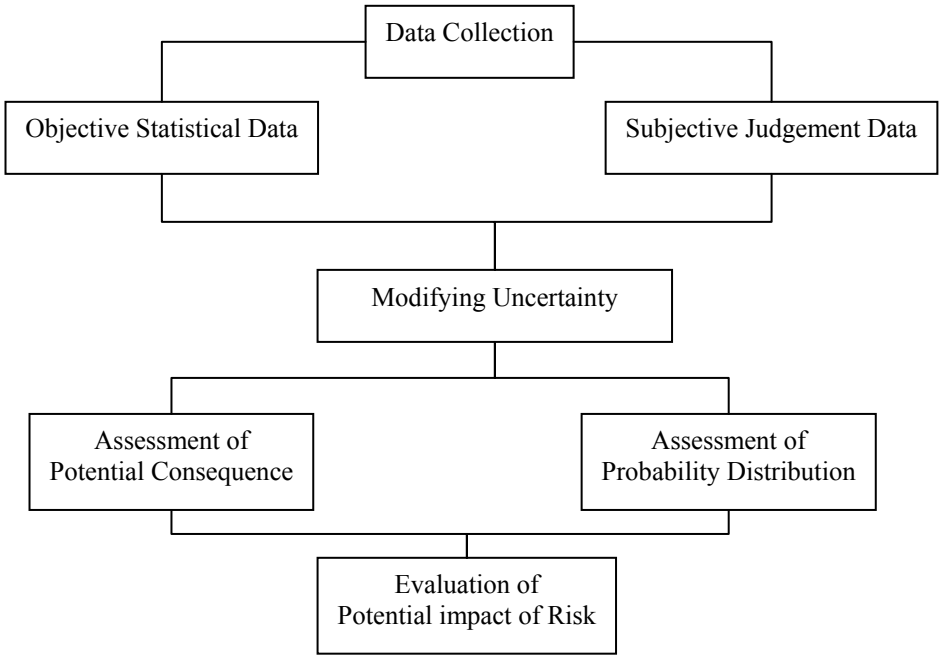


Figure 3.4. Risk Analysis and Evaluation Process (Tah and Carr, 2000)

*3.2.3.1. Data Collection*

The first step in the risk analysis and evaluation process is the collection of data relevant to the risk exposure to be evaluated. As Tah and Carr (2001) states, these data may come from historical records that the Contractor experienced in the past projects. Such data will be considered as objective or statistical in nature. Unfortunately, in many cases, directly applicable historical data concerning the risk are not available in adequate amount. Therefore available data are mainly subjective in nature and must be obtained through careful questioning of experts or people with the relevant knowledge.

*3.2.3.2. Modeling Uncertainty*

Modeling of uncertainty of a risk exposure refers to the "explicit quantification of likelihood of occurrence and potential consequences based on all available information about the risk under consideration". Likelihood of occurrence will be presented in terms of probability, and potential consequences will be

presented in financial monetary terms. Probability is considered as an explicit way of dealing with uncertainty. It is a device that permits management to incorporate all the available information concerning the likelihood of occurrence of a risk event into a single or combined number (Al-Bahar and Crandall, 1990).

#### *3.2.3.3. Evaluation of Potential Impact of Risk*

Having modeled the uncertainty of different risks events, the next step is to evaluate the overall impact of these risks in a single global picture. This evaluation will combine the uncertainty of an event with the potential consequences. Once the affects of the risk factors on the risks have been determined, the effect of the risks on the tasks can be calculated (Tah and Carr, 2001).

### 3.2.4. Response Management Process

As Tah and Carr (2001) states, once the analysis process is complete, the risks and their effects are quantified and it becomes necessary to set up procedures to handle them effectively. The manner in which the risks are handled in the system is crucial. During this process, four alternative strategies can be developed. The discussion on response management process will uncover these four strategies as risk avoidance, risk mitigation, risk retention and risk transfer. These strategies are generally based on the nature and potential consequences of the risk. The objective of these strategies is to remove the impact as much as possible and to increase the control of risk.

#### *3.2.4.1. Risk Avoidance*

Avoidance is useful for fairly common strategy to managing risks. By avoiding a risk exposure, the Contractor knows that he will not experience the potential losses that the risk exposure may generate. According to Wang and Chou (2003), it means the rejection or change of an alternative to remove some hidden risk. On

the other hand, as Al-Bahar and Crandall (1990) state, the Contractor loses the potential gains that may have been derived from assuming that exposure.

Contractor and Owner can avoid the risk by many methods, which include the following:

By a Contractor;

- Do not bid on the project.
- Tender a very high bid.
- Place conditions on the bid.
- Do not bid on the high risk portion of the contract.

By an Owner;

- Do not proceed with the project.

To illustrate, if a Contractor is concerned about potential liability losses associated with asbestos material or hazardous waste, he could avoid the risk by never acquiring any object that involves operations with such materials. Similarly, a Contractor may avoid the political and financial risks associated with a project in a particular unstable country by not bidding on projects in this country.

*3.2.4.2. Risk Mitigation*

Risk mitigation denotes reduction of the occurring probability or the expected losses of some potential risk and includes two methods. First is to reduce probability that a risk event would happen and second is to reduce the schedule delay or financial losses when a risk event happens (Wang and Chou, 2003).

Al-Bahar and Crandall (1990) state that many tools are available to a construction organization for risk reduction. Some of these risk reduction tools are as follows:

- Scheduling: If risks are time or weather related, rescheduling all or portions of the project may reduce or possibly eliminate the risks to acceptable limits. For example, a Contractor that has identified an early frost could increase the cost of concrete curing by requiring the installation of hoarding which could possibly reduce the risk from early frost by rescheduling the pour to an earlier data.
- Education: Many construction risks are related to safety. Safety impacts the productivity and quality of construction.
- Redesign: Construction risks can often be reduced by a judicial redesign to incorporate the construction plan. Scheduling of form work, construction loads, use of equipment and worker effort can often be optimized by a redesign.

*3.2.4.3. Risk Retention*

Risk retention is becoming an increasingly important aspect of risk management when dealing with project risks. Risk retention can be either planned or unplanned (Wang and Chou, 2003). Unplanned risk retention, where the manager does not take any action for some risk whether he or she is conscious of the risk or not; and planned risk retention, where the manager decides to take no action for some risk after cautious evaluation. Under such a plan, risks can be retrained in any number of ways, depending upon the philosophy, the particular needs, and the financial capabilities of the Contractor (Al-Bahar and Crandall, 1990).

*3.2.4.4. Risk Transfer*

Risk transfer means the switch of risk responsibility between contracting parties in a project. According to Wang and Chou (2003), Contractors usually use three risk transfer methods; insurance, subcontracting and contractual adjustments, to offload risk responsibilities.

*Insurance* is frequently used method of handling risk for compensating the financial losses resulting from risk events. The majority of Contractors rely upon insurance for the more serious loss exposures through the purchase of an insurance policy with certain deductibles.

By *subcontracting*, the Contractor will transfer parts of the risks to the subcontractor.

Contractual adjustments can involve claims to the Owner for financial losses or schedule delay resulting from risk events. Most noninsurance risk transfers are accomplished through provisions in contracts such as hold-harmless agreements and indemnity clauses or contractual adjustments. For example, one of the clauses of the contract can be adjustment in price where an extra compensation will be granted to the Contractor if different subsurface conditions are encountered. These essential characteristic of the contractual transfer is that the potential consequences of the risks, if the risk does occur, are shared with or totally carried by a party other than the Contractor.

### 3.2.5. Monitoring

The final phase of the CRMS model is risk monitoring process. After the project risks have been identified, assessed, analyzed and some kind of risk handling strategy has been adopted for them, the risk must be monitored to ensure that any avoidance measures are working and to enable effective action to be taken when the risk occur (Wang and Chou, 2003). It must be recognized that the business environment and the Contractors operating within it are subject to constant changes. Therefore, an effective risk management program is not static but must be dynamic and ongoing (Al-Bahar and Crandall, 1990). In this case, the status of the risk changes and the monitoring process continues to ensure that the assessment and handling procedures are effective and if so those strategies are working. If any of these prove to be negative then the risk may need to be re-assessed, re-analyzed or a new handling strategy adopted.

### 3.3. Risk Allocation in Contracts

Each party in a contractual relationship will perceive risks from their unique perspective and these perspective scenarios do not cover all risks. Thus, project participants do not have a shared understanding of the risks that threaten a project. Consequently they are unable to implement effective early warning measures and mitigating strategies to adequately deal with project risks (Tah and Carr, 2001). Owners, who are the ultimate beneficiaries of the contract, may only be considering the project from a market share or production requirement perspective. Their greatest overall risk could reside in the ultimate product and not with the finished facility. If the Contractor has divergent perceptions of risk allocation with the Owner or a lack of clear understanding to risk management, the Contractor will inappropriately manage the risks in construction projects by assuming that the risk events or consequences are not the contractor's responsibilities (Smith and Bohn, 1999). According to Wang and Chou (2003), to make risk management more efficient and effective, all parties must understand risk responsibilities, risk event conditions, risk preference, and risk management capabilities.

In the previous sections, eight major classifications are stated to organize the types of risks. The following sections discuss how these risks are managed by the Contractors in each risk category and how risk allocation between Owner and Contractor are handled by contract clauses.

#### 3.3.1. How Contracting Parties Manage the Risks

In construction, it is observed that risk management has been closely linked with Contractor's contingency and insurance. According to Smith and Bohn (1999), Contractor contingency can be thought of as a Contractor's estimated value of the extraordinary risks they will encounter in a project. Extraordinary risk would be those risks not covered by bonds, insurance, or the contract. It is also assumed that Contractors also have their own historical records to consider in setting

contingency values. It is known that all Contractors use contingency for every contract and generally the percentage is around 5–10% of the contract value. A significant business risk in construction is procuring contracts at a price that will yield a profit. A Contractor is less likely to win a contract, if contingency is set too high. Contingency set too low could result in significant financial losses. Therefore, Contractors would be wise to consider the likelihood that a particular risk will occur, identify the potential financial impact, and then determine the contingency.

Many Contractors think of risk management as insurance management where the main objective is to find the optimal economic insurance coverage for the insurable risks. It is significant that risk management has been extended well beyond the normal confines of insurance. Risk management has a broader meaning and involves more than just insurance management. As Tah and Carr (2001) state, it is a quantitative systematic approach starting with risk identification, probabilistic risk analysis and evaluation of significant risks, and the development of alternative risk management strategies to managing risks faced by Contractors. Setting responsibilities and deciding the method of management is crucial for risk management since it provides guidelines for consistent actions in managing the risks and once the guidelines are adopted, contractor does not have to restudy recurring problems before making decisions. Before discussing the risk allocation by contract clauses, setting responsibilities and method of management in each risk category will be mentioned and illustrated in Table 3.2.

Table 3.2. Management of Risks by Responsible Parties (Smith and Bohn, 1999)

| Risk Category | Risk Events | Responsible Party | Response management |
|---|---|---|---|
| Natural Risks | Acts of God | Owner<br>Contractor | Insurance<br>Contingency |
| | Loss due to fire or accident | Contractor | Insurance<br>Safety control |
| Design Risks | New technology | Owner<br>Contractor | Insurance<br>Insurance |
| | Scope changes | Owner | Mitigation |
| Logistics Risks | Loss or delay due to resource availability | Owner<br>Contractor | Mitigation<br>Contingency |
| | Loss or delay due to damaged or late materials | Contractor | Insurance<br>Mitigation |
| Financial Risks | Inadequate cash flow | Contractor | Mitigation |
| | Exchange rate and inflation | Owner | Contract clauses |
| | Cost overruns due to schedule delay | Owner<br>Contractor | Contract clauses |
| Regulatory Risks | Permits and license | Shared | Mitigation |
| | Changes in regulation | Owner | Contingency |
| Political Risks | Loss or delay due to war | Owner | Contingency<br>Allocation |
| Construction Risk | Labour strikes<br>Inclement weather | Contractor<br>Contractor | Mitigation<br>Mitigation |
| Environmental Risks | Ecological damage, pollution | Owner | Contingency |

*3.3.1.1. Natural Risks*

Contracts usually consider natural risks such as, catastrophic events and losses due to accidents, and minimize their influence with required insurance or clauses to provide equitable adjustments for the delays. However, without a contract clause addressing natural risks, the Contractor will assume the complete risk of these losses. Contingency would be the only mechanism for managing physical

risk in these cases. Contingency in this event would be a form of self-insurance (Smith and Bohn, 1999).

*3.3.1.2. Design Risks*

The Owner traditionally assumes most of design risks, and the Owner's project budget should have some level of contingency. According to Smith and Bohn (1999), the Contractor has some risk exposure with new technology installation risks. It is difficult to estimate productivity and potential delays without a basis for making the estimate. Rather than include contingency, Contractors adjust their productivity rates or unit costs to reflect anticipated difficulties. In design-build or construction management it is common to add additional sums for unknowns and difficulties. This form of contingency is not allocated to overall project risk but for specific work related risks. In the event of scope changes without proper contract language Contractors would include contingency. However, the recommended method for handling scope changes is through proper allocation in the changed conditions clause. Differing site conditions and changed design are similar to scope changes.

*3.3.1.3. Logistics Risks*

As Smith and Bohn state (1999), for logistics risks, the commonly suggested management method is to mitigate the risk through better planning. Contingency is recommended is to cover losses or delays due to resource availability. Contingency would cover the costs of expediting the resource or subcontracting the work. The Contractor could use contingency to offset poor project planning and estimating. In the future, logistics risks should include information flow and relationships. Partnering is an example of a mitigation technique to overcome the risks associated with communication problems and relationships.

*3.3.1.4. Financial Risks*

Project related financial risks are carried by the Contractor, with the greatest exception being the overall project funding by the Owner. Contractor default is a form of financial risk that the Owner can reduce by prequalification, but performance and payment bonds are more directly aimed at shifting the risk to the surety. The Contractor obviously has a major risk in the event of contract default. They can minimize the extent of this risk by carefully selecting projects and avoiding ventures where they have little expertise. Contractor financial risks often arise from poorly prepared estimates (Smith, 1992).

*3.3.1.5. Legal and Regulatory Risks*

Al-Bahar and Crandall (1990) argue that permits and licenses should be a shared project risk. Many legal and regulatory liability risks are covered by the various insurance policies purchased by the contracting parties. Changes in regulation, which may create additional project expenditures, are the Owner's risk to be considered in their contingency.

*3.3.1.6. Political Risks*

Political risks are generally assigned to the Owner. Political risks are external to the project and unpredictable in frequency and magnitude. The management of political actions is primarily the owner's responsibility, and the management method recommended is usually a contingency (Tah and Carr, 2000).

*3.3.1.7. Construction Risks*

Mitigation measures are the most recommended management method. The mitigation measures focus on improved planning and implementation of project control systems. Contingency is an alternative management method in quality problems, poor productivity (time contingency), changes, and delays. These problems are predictable, which suggests that they can be anticipated, but their magnitude and cost are very difficult to forecast. For quality problems, rework

can be estimated from prior work, if rework costs have been independently tracked. Generally, rework costs are part of historical costs but are not tracked independently. Schedule contingency and related cost contingency can be allocated for potential productivity problems. The owner usually sets the schedule deadline so that schedule contingency would include mitigation measures such as increasing the number of crews. This contingency is most directly addressed to sensitive activities or those with an anticipated higher risk. Construction changes should be included in a changes clause, but in those instances where no clause exists, an extension time for changes in works should be allowed to the Contractor. Losses due to the Contractor's poor planning or execution would have to be recovered from internal funds. Recovery for errors in method selection may not be possible, even with a contingency account. Changes in the method of construction are highly significant when the estimate and schedule are both linked to preproject planning assumptions (Smith and Bohn, 1999).

#### *3.3.1.8. Environmental Risks*

Environmental risks could be argued that it should be classified with political risks, because this legislation tends to change frequently. The Owner has the greatest level of control on the environmental risk during the site investigation and design phases. However, the Contractor is exposed to the environmental risks during construction (Smith and Bohn, 1999).

### 3.3.2. Risk allocation by Contract Clauses

Baloi and Price (2003) states that the principal guideline in determining whether a risk should be transferred is whether the receiving party has both the competence to fairly assess the risk and the expertise necessary to control or minimize it. Contractors are not normally responsible for risk factors outside their control and traditional forms of contracts should provide a fair and sensible allocation of risks between the contracting parties. Contractors will not get a

satisfying outcome from risk management without a clear understanding of the risk allocation. To handle risks successfully, Contractors should realize the risk allocation in projects. Before the contract is awarded, owners already allocate project risks through contract clauses in projects. Contractors are typically unable to influence the contract conditions and clauses. For this reason, it is indispensable for the Contractors to understand which risks they should undertake. However, there are often different interpretations of risk allocation between Owners and Contractors. According to Wang and Chou (2003), disagreements may result from the absence of related contract clauses, unclear stipulations, or queries about the fairness of risk allocation. In every construction project, only parts of the risks are distributed by the contract, and the other risks are appointed simply through common practice. Even if provisions do exist, they are often unclear or controversial. All obscure conditions are contractors' chances, which should be taken care of to minimize or transfer the contractors' risk responsibilities. In short, risk allocation by contract clauses includes four kinds of conditions (Wang and Chou, 2003). They are:

*Type 1:* The contract clauses definitely state that the Owner should take certain risks. In regard to the risks allocated by contract clauses, the conditions of contract involving the Owner's responsibilities for certain risks are definite, and the Contractors have no objections. Such risks can be arise out of changed orders arising from political factors or changed Owner demands, and the other is risks of financial losses resulting from political pressure. Because the Owner takes such risks, Contractors need not put these risks into their handling of decision making.

*Type 2:* The contract clauses definitely state that the contractor should take certain risks, and the Contractor has no objection to such allocation. Contractors take the risks without objection in this type if the financial losses are covered by insurance, or if construction delay or extra costs are caused by the Contractors, subcontractors, suppliers, or workers. Because such risks should have been

effectively controlled by the Contractor's experience, Contractors have the responsibility to take the effects resulting from these risks

*Type 3:* The contract clauses definitely state that the Contractor should take certain risks, but the Contractor is unwilling to accept such allocation. Even though the contract provisions are definite, some disputes still arise between the two contracting parties if the contracts allocate the risks arising out of factors beyond Contractor's control, such as changed laws, inflation, or design consultant factors.

*Type 4:* The contract do not state definitely about certain risks, and for this reason the risk allocation remains unconfirmed. Although the risks arise from factors that are beyond Contractor's control, such as adverse weather events and supervisor factors, Contractors must take the risks of delay or financial losses if they do not make any claim.

*Type 5:* Although there exist no clauses in the contract to allocate certain risks, the two contracting parties reach an agreement that the contractor should take the risks. The risks, which are not allocated by contract clauses, all arise out of third-party factors, including the entrance of the site, public security, and neighborhood relationships. For this reason the contractors have no choice but to take the additional expenses.

It can be concluded that the Owner has a greater tendency to allocate certain risk to the Contractor if the risk is easier to change the probability or effects of its happening. Furthermore, if the probability of a certain risk event condition is uncontrollable, the Contractor's tendency of risk handling changes from actively transferring the risk to passively retaining the risk. On the other hand, if a risk is controllable and certainly allocated to the Contractor, the Contractor tends to take the initiative to reduce the impact caused by the risk event rather than retain the risk.

Thus, the aim of this research is to examine how risk factors are shared between different parties in most widely used standard conditions contract in Turkey, namely FIDIC and General Specification for Public Works and investigate how the risk management strategy of Contractor change with respect to different contract conditions.

Before giving the content of the interview and concepts related to this study, general information about FIDIC and GSPW contracts will be given in the next chapter.

# CHAPTER 4

# GENERAL OUTLOOK OF FIDIC AND GSPW

Standardization both in technical and administrative matters is essential for the satisfactory completion of projects of civil engineering construction. In order to complete a project within the required time and budget it is essential that each phase of its preparation and execution, starting with the assessment of feasibility and terminating with the handing over the completed project by the Contractor to the Owner, be formulated with the precision in order to limit delays, disputes and unforeseen additional costs.

These contracts not only ensure timely completion of the project but also provide comfort to the investors, mitigate risks, fix liabilities and responsibilities in the construction phase. Therefore, the contract conditions are central to successful project development.

There are obvious advantages to using detailed contract provisions based upon a standard form of contract which holds a reasonable balance between the requirements and interests of the parties concerned and in particular allocates fairly the risks and responsibilities between the contracting parties. In the majority of the cases the contracting parties will react favorably to clearly stated obligations and this provides to avoid unsatisfactory performance, increased costs and disputes which can arise if the trust is lacking between contracting parties.

The use of standard conditions of contract will not only facilitate the successful completion of a contract but will result in lower tender prices, as tenderers will be familiar with the conditions that will apply under the contract. This implies that they will not need to make financial provision for contract conditions with which they are not familiar and whose consequences they may have difficulty in assessing. The use of standard conditions of contract also provides a stable basis for training and educating personnel responsible for contract management and avoids working with ever changing contract conditions.

### 5.1. General Information About FIDIC

The International Federation of Consulting Engineers (FIDIC) was formed in 1913 by five national associations of independent Consulting Engineers within Europe and has produced the standards forms of contract for international civil engineering projects (Lina, 1997). The FIDIC Conditions of Contract for Works of Civil Engineering Construction were first published in 1957 for use in international projects. Up to that time there were no conditions which had been specifically prepared to govern international contracts. The first edition of the FIDIC Conditions (the Red Book as it quickly became known because the title was long and the cover was red) was published at a time when a standard set of international conditions of contracting became apparent. The first edition was based on a form of contract in use in the United Kingdom which was published by the Institution of Civil Engineering (ICE) and thus very much reflected traditions and legal system that were specifically British.

A second edition was issued in the mid-sixties but this did not change the conditions contained in the first edition, only a part III was added to the first edition to provide particular changes to the General Conditions when the document was to be used for dredging and land reclamation contracts.

A third edition which involved a complete revision was published in 1977 and was accompanied by an explanatory document entitled “Notes on Documents for Civil Engineering Contracts”.

In 1983, the Executive Committee of FIDIC appointed a drafting committee comprised of members of the Civil Engineering Contracts Committee (CECC), which monitors the use of the Red Book and is responsible for reporting to the FIDIC Executive Committee. The CECC advised the Executive Committee that in some quarters the document was being criticized by Employers (Owners) for being too Anglo-Saxon in its concept and language. Certain amendments were identified which were being applied almost consistently by Employers and it was considered advisable to bring the Conditions into line with current practice. Another factor was that in many cases where the Conditions were being used for projects in developing countries, the representatives of the Employer did not have the authority to delegate duties to the Engineer which it had been envisaged that they would have when the third edition was prepared and it was felt desirable to reconcile the Conditions with current circumstances.

Accordingly, the Executive Committee requested the CECC to prepare a fourth edition and the following is a brief summary of the terms of reference (Guide to the use of FIDIC, 1989):

- Change only where change is necessary.
- Maintain the basic role of the Engineer.
- Pay close attention to some specific topics such as Bonds and Guarantees, Apportionment of Risk, Insurance, Claims Procedures, Certificates and Payments and Dispute Procedures.
- Endeavor to update the language so that it is more understandable to those charged with administering the Conditions on site.

The results of the work of the drafting committee were approved in 1987 and the fourth edition of the Conditions of Contract for Works of Civil Engineering

Construction was published at the Annual Conference of FIDIC held in Lausanne, Switzerland in September of 1987.

There were some procedural differences in the drafting process as compared with the third edition. In the preparation of the third edition, representatives of the Contractors' Associations had participated almost as co-drafters and it had been indicated on the cover of Conditions that the document was approved by the various contractors' groupings throughout the world. For the fourth edition it was agreed that the contractors' representatives would have consultative status during the drafting process but the final document would be the sole responsibility of FIDIC. European International Contractors (EIC) were mandated by the Confederation of International Contractors' Associations (CICA) to represent CICA in this consultative role and the EIC representatives were assisted by two representatives of the Associated General Contractors of America (AGC).

In addition, during the course of the revision there was considerably more consultation with the World Bank than had been the case in the previous revisions. Also, FIDIC was able to benefit from meetings with the representatives of the Joint Arab Funds, who have substantial experience in monitoring the use of the third edition. FIDIC greatly appreciated the opportunity for consultation with both of these bodies, but this consultation does not imply that either organization approves the fourth edition in its entirety. In the fourth edition, the following general principles have been achieved (Guide to the use of FIDIC).

- The role of the Engineer has been maintained.
- The role of the Employer has been more visible. Where increases in cost or extensions of time are to be determined by the Engineer, he has an obligation to consult with both the Employer and the Contractor before making his determination.

- Every endeavor has been made to maintain the overall balance of rights and obligations between the two parties to the contract.
- Current practice has been reflected in the new edition.
- Procedures have been set out in greater detail and in an action- oriented way.
- Greater recognition has been made of the fact that some design of Permanent Works is made the responsibility of the Contractor.

FIDIC Secretariat receives requests from time to time to assist in the interpretation of individual contracts which are based upon conditions of contract similar to those contained in the fourth edition. It should be evident that as a Federation of Consulting Engineers cannot consider itself competent to give legal advice and in any event the legal interpretation of a contract will depend upon the law governing the particular contract as well as precise wording of the contract. The interpretation of individual clauses in a specific contract will be determined by the Courts or by arbitration.

### 5.2. General Information About GSPW

The Ministry of Public Works and Settlement was formed in 1983 with the merging of the Ministry of Public Works and the Ministry of Reconstruction and Settlement, which had been established in 1920 and 1958 respectively, for the purposes of carrying out civil works and major repairs concerning public buildings, and highways as well as providing services related to physical planning, land development and housing for low income families as well as extending disaster relief.

The main field of activity of General Directorate of Construction Affairs includes assessments and determination of the requirements of public organizations regarding buildings and other facilities: preparation of architectural

and engineering projects, as well as tendering, controlling and technical acceptance of construction activities of public buildings.

The purpose of General Specification for Public Works (GSPW) is to establish the general principles and procedures that will be applied in performance of the works that are contracted as per Public Procurement Contracts Law No: 4735. This GSPW covers the works that are awarded as per the provisions of this Law by the contracting entities subject to Public Procurement Law No: 4734 and that are contracted over the lump sum or unit cost as per Public Procurement Contracts Law No: 4735.

The aim of the research is to compare related conditions of FIDIC and GSPW with respect to the risk allocation scheme in these two contracts. For this purpose, an interview form (Appendix A) has been prepared and interviews have been conducted using this structured form.

The content of the interview is given in the next chapter that is followed by another chapter in which research findings of the respondents are presented.

# CHAPTER 5

# RESEARCH METHODOLOGY

Risks can be transferred, shared, accepted, managed, or minimized but cannot be ignored (Latham 1994). Construction risks are often project specific and are allocated to different parties through contract conditions. A completely definitive and exhaustive allocation of risks cannot be achieved since not all the risks are foreseeable at the outset. Moreover, quantification of foreseeable risks may be neither always possible nor correct. As a project progresses, the nature and extent of foreseeable risks may change, new risks may emerge, and existing risks may change in importance or be reallocated and may influence other risks. Furthermore, some of the risks may require the combined efforts of all contracting parties for their effective management. Such uncertainties and unforeseen risks would need to be managed using an effective risk management strategy. This implies a careful investigation for contract conditions that can enable a selection of the best available options at the time of their occurrence and with the joint efforts of all contracting parties. This significant concept means that contracting parties should; proactively and jointly address known risks in the project and allocate these risks in the contract, work together at expressing the liabilities of the Contractor and the Owner as terms of a contract, reach an agreement on a systematic approach to the selection of the tenderers and evaluating of them, define the role of the Engineer under the contract, decide how resolution of conflicts can be accomplish under certain conditions of contract. The goal of risk management should be to minimize the total cost of risks to a project, not necessarily the costs to each party separately, and minimize risk.

In the context of this research study, the main objective is to find out what kind of differences are revealed in the risk management strategy of the contractor when all the works are performed and executed in accordance with FIDIC compared with GSPW. Additionally, the respondents are inquired to state how the contractor should deal with the risks that can occur during the project when the contractor will carry out the works under FIDIC contract. It is the project manager who is the key to an effective contract administration relationship with the owner. He is responsible for controlling all cost, schedule and contractual aspects of the project, checking field engineering, reviewing time schedules, providing coordination, setting and attending meetings with the engineer and owner, approving and checking subcontractor requisitions and resolving the disputes. In order to reveal the risk management strategies of the contractor's under the conditions of FIDIC contract, an interview study is carried out with experienced project managers. The following paragraphs discuss the administration and content of the interviews in detail.

### 5.1. Administration of Interviews

This research consists of a set of face-to-face interviews carried out with the respondents at the managerial level. Each interview took about from 1 ½ to 2 hour depending on the amount of discussion generated on particular risk issues. There are three project manager participated in this study. The interview has been established covering four main questions. After presenting brief information about contract administration and risk management to the managers, the aim of the research is explained and the project managers are requested to state their ideas on the questions.

### 5.2. Content of the Interview

The interview has four questions and one of the questions includes a table showing the differences between the contract provisions of FIDIC and GSPW. A sample of the interview form can be found in Appendix A.

In the first question, respondents are asked to state the basic differences in the contract conditions when FIDIC compared with GSPW. The main goal of asking fundamental differences is to reveal the approach that the conditions of the contracts are based on and the relationships between the contracting parties in accordance with the contract provisions. The contract is the key framework for setting standards of behavior and trust shown by others, and ultimately the project's performance. Close cooperation and teamwork between Employer, Contractor and Engineer will reduce to a minimum the risk of mistrust or lack of confidence within the framework of the contract. Contracting parties often work in disjointed relationships, usually motivated by divergent objectives and hidden agendas. Other consequences include time and cost overruns, poor quality, owner dissatisfaction, lengthy and costly disputes, and disruption of relationships among the contracting parties. Moreover, the FIDIC Conditions of Contract cannot apply without an Engineer being appointed by the Employer to administer the Contract. The Engineer is not a party to the Contract, but he plays an important role in the development process of the Works. Therefore it was essential to discuss the role of the engineer under contract provisions with the respondents.

One of the objectives of the contract is to serve as a framework between the parties to establish which one has assumed which risk. Risk in a construction project can not be eliminated, but it can be minimized or transferred from one party to another. Risk allocation always occurs in any situation where more than one party is responsible for the execution of a project. Different project participant groups (Owners, Contractors, and Consultants) have inherently different perceptions of preferred allocation of risks, both between and within the groups. An Owner should favour efficient allocation of risk between parties to a project that reduces risk and improves project performance. Appropriate risk allocation is a significant contributor to low transaction cost of any specific project and vital issue in the success of the contracting process. However, in an Owner–Contractor relationship, a common aim of Owners appears to be to avoid

risk as far as possible by allocating as many risks as it can to the Contractor. One way in which the contracting parties attempt to address the right and responsibilities for risk is through dealing directly with the contract provisions. Therefore, respondents are requested to mention risk allocation principles between the Owner and the Contractor in the GSPW and FIDIC conditions of contract. In addition, conditions of contract define the rights and obligations of the two parties, the Employer and the Contractor, in their relationship for the realization of the project. Thus, respondents are also asked to explain the duties and responsibilities of contracting parties under contract provisions. The aim of asking this question is to expose risk responsibilities of the Employer and the Contractor during the project under the contract. Before asking the next question, the table, showing the differences between the contract provisions of FIDIC and GSPW, is demonstrated to respondents and they are inquired to comment on the conditions about which differences are more important and should be taken into consideration in terms of risk management.

A claim can be defined as a situation where the contractor gives written notice that a condition exists which requires an adjustment in the contract time and/or cost and the owner fails to recognize it. There are numerous conditions which cause a contractor to exercise his contractual rights due to disputes or claims for extra cost and additional time. The most common claims result from changes in scope, construction details, and field conditions, or error and emissions in design, suspension of work or work stoppage, time extensions, and variations in unit quantities. Conversely, the Owner may place a claim against the Contractor based on lack of performance, poor quality of work, and shortages in quantities of material. When disputes between the Employer and Contractor arise, contracting parties can refer these disputes to an independent authority. This independent authority will decide objectively who is right and who is wrong and how and when any award will be implemented. It is called arbitration. Ignoring or delaying the resolution of conflicts can have serious implications to the parties in their future relationships. Addressing conflicts and facing issues as they occur

can be an important key to reducing conflict within the construction industry. Clearly, disputes are never reduced with time, but grow larger as they are left unresolved. The sooner the conflict can be identified and addressed, the higher the percentage of resolution success and the lower the cost. Therefore, in the third question of the interview, respondents are asked how conflicts and disputes can be resolved between the owner and contractor under the GSPW and FIDIC conditions to find out how the contracting parties approach the disputes and conflicts and how can a conflict resolution system, in other words, arbitration is designed to prevent these conflicts from starting in the first place.

Risk management is a critical factor to successful project management, as projects tend to be more complex and competition increasingly tougher. There is a direct relationship between effective risk management and project success since risks are assessed by their potential effect on the objectives of the project. It is observed that the responsibility and attendant authority for carrying out a contractor's risk management policy is still ill-defined. This may result in gaps in coverage, under insurance as well as over insurance, excessive premiums, and overlapping of insurance coverage. Many Contractors have begun to realize the need to establish a formal risk management function in their organization since it provides guidelines for consistent actions in managing the risks. Therefore at the end of the interview, respondents are asked to state the risk management strategies of the contractors that are carried out under the conditions of GSPW and FIDIC contract. The aim of this question is to find out the different risk handling strategies utilized by the Contractors under GSPW and FIDIC contract. Moreover, respondents are inquired to tell specific examples that demonstrate risk management strategies which the Contractors applied during the project under FIDIC contract. Bidding Phase was discussed with the project managers to find out how the contractors can manage their risk during bid preparation.

In this interview, managers' ideas about contractor's risk management strategies under GSPW and FIDIC contract are questioned. In the context of this survey, a general view about risk management and contract administration in GSPW and

FIDIC, risk responsibilities of contracting parties and arbitration are identified in the light of the interview findings.

Findings of the interviews are presented in the following chapter reflecting the general opinions on the research topics.

# CHAPTER 6

# RESEARCH FINDINGS

In this chapter, answers of the respondents are evaluated. Results of the interviews are organized under main headings since it would be worthwhile to present similar and different opinions of the respondents about the questions and risk management strategies of the Contractors' under the conditions of FIDIC and GSPW contracts.

## 6.1. Parties to the Contract

The FIDIC and GSPW Conditions of Contracts are based on the assumption that the Employer who has decided to have certain works carried out for the implementation of a project, and has decided to select a suitably qualified Contractor to execute the Works. The following paragraphs will give the profiles of the contracting parties in the FIDIC and GSPW contracts. Firstly the role of the Engineer will be discussed in both contracts and then the Employer's and the Contractor's obligations will be explored in accordance with the contracts provisions.

### 6.1.1. Role of the Engineer

The Agreement will stipulate as the primary duty of the Engineer that he carefully observes the requirements of the Employer in the realization of the project. It is important to note, however, that the Conditions of Contract between the Employer and the Contractor stipulate that where, under the Contract, any of the Engineer's duties are discretionary, the Engineer shall act fairly between the

Employer and the Contractor and apply the contract in an impartial manner. The Conditions are based upon this fundamental principle and this requirement applies even if the Engineer is a member of the Employer's staff (Guide to the use of FIDIC, 1989).

The duties under the FIDIC and GSPW conditions which are allocated to the Engineer include the issue of information and instructions to the Contractor and the work proceeds, commenting on the Contractor's proposals for carrying out the work, ensuring that materials and workmanship are as specified, agreeing measurements of work done and checking and issuing to the Employer interim and final payment certificates. In administration of the contract all communications with the Contactor pass through the Engineer, thus avoiding possible confusion and misunderstanding although meetings with the Employer, the Contractor and the Engineer should be held regularly.

As the works progress the Engineer will be required by the contract to give instructions, give or refuse approval or consent, approve work, authorize payments, issue certificates, etc. It should be understood by both parties to the contract that in giving approval or consent and such other acts which are the duty of the Engineer, his objective is to ensure that the Employer receives the works at the completion in accordance with the requirements of the contract and that the Contractor is suitably rewarded for the work he carries out.

FIDIC conditions provide the Engineer to appoint the Engineer's representative but the Engineer is responsible for his actions. However, the identity of the person appointed must be made known to the Employer and the Contractor before such appointment can become effective. Such duties and authority as the Engineer may wish to vest in the Engineer's representative must be delegated in writing and care should be taken to ensure that the written delegation is specific.

The engineer has obligation to give his instructions in writing, or if the Engineer considers it necessary that instructions are given orally, they shall be confirmed in writing as soon as possible thereafter. It should be noted also that where the

Engineer does not give written confirmation of an instruction to the Contractor then the Contractor may himself confirm to the Engineer that he has received such an instruction under FIDIC conditions. If the Engineer fails, in writing, to contradict such a notice within 7 days the instruction is deemed to have been given by the Engineer to the contractor.

Again only under FIDIC conditions, the Engineer's duties will normally include instructions relating to management of the contract and changes in the nature and extent of the work, the cost thereof and the time for completion. In addition, the FIDIC conditions are based upon the principle that the Engineer has the authority to determine additional payments. This is in the interests of efficient management and avoidance of duplication of effort. For example, the issue of the instructions to proceed with or to suspend the progress of the Works is a matter of management. This issue will be explained in detail in the following sections.

### 6.1.2. The Employer's Obligations

The Employer consents to, or declines, requests by the Contractor to assign any portion of the Works, prepares the contract agreement for execution by both parties, approves the Performance Security and the insurers as well as the terms of the insurance policies submitted by the Contractor in both FIDIC and GSPW contracts. The Employer will wish to ensure that the contract works insurance is in accordance with the laws and regulations of the country in which the works are to be executed. Provided it is acceptable to the Employer the Contractor will normally use his customary sources for the provision of securities and insurance (Guide to the use of FIDIC, 1989).

The Employer takes over sections of the works as they reach substantial completion and ultimately takes over the whole of the Works following the issue of certificates by the Engineer in both contracts. In the event of the Contractor becoming liable for liquidated damages, the Employer may deduct an amount in accordance with the conditions of contract.

The employer may authorize work to be completed by others if the Contractor is in default. Moreover, the Employer can terminate the contract in the event of the Contractor failing to perform his obligations under the contract provisions. However, only in conditions of FIDIC, the Employer, if he defaults, can also be subject to cancellation of the contract by the Contractor or to suspension of work by the Contractor. The subject of the default of the Employer will be mentioned in the following sections in detail.

### 6.1.3. The Contractor's Obligations

The obligation of the Contractor is to execute and complete the works, for which he has submitted his tender, within the time specified in the contract. In FIDIC and GSPW, the Contractor receives and complies with instructions from the Engineer acting on behalf of the Employer and is responsible for the care of the works throughout the construction period until the works are officially taken over by the Employer or are deemed to be taken over by the Employer

After receiving notification from the Engineer, the Contractor in both contracts shall submit the securities, guarantees and insurance policies required by the Contract and shall commence the works. He prepares the construction programme, provides all necessary materials, Contractor's Equipment, Temporary Works, management, superintendence and labor and selects the method of carrying out the works. The Contractor is responsible for his own staff and work force and for taking out social and other insurances in respect of his personnel. He must comply with all applicable laws, by-laws and regulations and ensure that all those for whom he is responsible also comply (Guide to the use of FIDIC, 1989).

The Contractor is required to use all reasonable care and means to prevent damage to roads or bridges due to exceptional loads or intense traffic, whether the transported goods are materials, plant, contractor's equipment or temporary works. For the transportation of materials and/or plant, if any law or regulation requires the haulier to be responsible for any damage or additional cost due to

transport thereof, the Employer shall not be liable. In all other cases, because materials for the permanent works and plant are specified in the contract and are not solely at the choice of the Contractor, the Employer shall meet the costs and negotiate the settlement except that the Contractor shall repay such parts thereof which could have been avoided with reasonable care under FIDIC conditions. However, of all service roads required by the contractor for the performance of the work and the construction and maintenance costs of temporary bridges and passes over these and the costs of precautions to be taken on public roads shall be borne by the contractor in GSPW otherwise stated in the contract.

Contractual rights of the Contractor will be clarified in the following sections but to summarize under conditions of FIDIC, in the event of default by the Employer the Contractor may suspend progress of the works or reduce the rate of work and claim an appropriate extension of time and/or additional payment.

Before discussing the risk responsibilities of the Contractor in the GSPW and FIDIC conditions of contract, perceptions of the respondents about the contracting parties in both types of contracts will be given in the following paragraph.

Respondent A states that; there exists three different parties in FIDIC namely, Employer, Contractor and Engineer. Here, the Engineer is in the position of Employer's consultant. However, in GSPW there are two parties namely, the Employer and the Contractor. The Engineer in GSPW is not like an independent party in the position of a consultant but mostly as a salaried official of the Employer. Respondent B believes that; GSPW is a contract made in favour of the Employer. Whereas FIDIC is a contract made to stand at equal distance to both, the Employer and the Contractor. As emphasized by Respondent B, in FIDIC, the Engineer stands at equal distance to both parties while it is like a party protecting rights of the Employer in GSPW. Respondent C argues that FIDIC is a contract written assuming the engineer remains neutral and does not have any malicious intentions. However, GSPW is a contract written in favour of

the Employer and assuming that any problems to arise, originate from responsibility of Contractor.

### 6.2. Risk Responsibilities of the Contractor

Respondent A states that risk management is not very popular in construction works. It is not considered at the frontline in Turkey. Risk management strategy depends on professional experience and personal knowledge of manager and it is not a systematic and objective procedure in Turkey. When risk management is handled and applied fully in Turkey, a contractor firm can not obtain the chance of being awarded any contract and it loses its competitive advantage. This implies that still, risk management is associated with contingency and its principles are not known by the contractors.

According to Respondent A, the risks have been defined better in FIDIC since it is an international type of contract. For this reason, it examines the relations between the Employer and the Contractor in more detail. Any and all types of bilateral relations have been defined in written form. Relations between the Employer and the Contractor are not fully written under GSPW conditions. FIDIC is a contract made to be used by the parties in good faith while performing of works by the Employer and the Contractor. FIDIC is a contract, articles of which are made for both parties not to cheat each other and not to violate the rules. FIDIC is a contract made for the works to be carried on fastly. Both sides have to give notice priorily to the other side about all of the works it is going to perform from before a certain period of time. This means that the party that does not give notice to the other in a specified time in the contract loses its right. In this context, FIDIC seems to be more strict. In GSPW risks have not been defined in detail when compared to FIDIC. Reason of this is that GSPW is a specification already used in tenders applied in Turkey. An expression saying that this work is performed as per the Turkish Republic Constitutional Laws is included at the end of the contract appendix. By this way, all of the risks not being specified in GSPW become specified in detail by the

Turkish Code of Obligations, the Turkish Criminal Code, and the Turkish Trade Code. In other words, even it is not being indicated in GSPW, the Contractor can apply to the Court and file a suit as based on the Constitutional Laws of the Republic of Turkey. From this point of view, GSPW is not as strict as FIDIC. The following sections will explain risk responsibilities of the Contractor under the contracts provisions.

### 6.2.1. Employer's Risk

The Contractor is to bear the cost of rectification of loss or damage which arises from any cause, other than those which are described as Employer's risks. Employer's risks in both contracts are impossible to be insured such as the risks arising from wars, domestic mobilizations, rebellions, and domestic wards, radiations arising from a nuclear fuel or loss or damage due to the use or occupation by the Employer. In FIDIC contract, it is stated that where damage is caused by an Employer's risk there is an obligation upon the Contractor, if requested by the Engineer, to rectify but the costs of such work are to be borne by the Employer. The extension time that is entitled by the Contractor shall be determined by the Engineer. Whereas in GSPW, only necessary time extension shall be given to the Contractor for the delays that may arise owing to such damages and losses. In case of Employer's risk, any additional cost to be paid by the Employer to the Contractor is not stated in the GSPW conditions.

### 6.2.2. Adverse Physical Conditions

The Contractor is not responsible if the works are damaged by an operation of the forces of nature against which he could not reasonably have been expected to take precautions under FIDIC conditions. Adverse physical conditions are accepted as Employer's risk in FIDIC conditions of contract. If the Engineer is of the opinion that adverse physical obstructions or conditions could not reasonably have been foreseen, after consultation with the Employer and Contractor he may determine an extension of time to be allowed to the Contractor and any additional costs to be added to the contract price. The

contractor is required to give the earliest possible notice to the Engineer. Respondent B mentions about a case that the trucks of Contractor X stepped on a mine on the road when going to the construction site. Due to this event, Contractor X has suffered from a loss. Help is requested from the country's gendarmes for this mine to be removed. Cleaning of the road from mines by the gendarmes lasts around three months. Therefore, the Contractor requests extension of time. However, the Engineer gives an extension time of just 1 day for cleaning of mines. Whereas, it does not give this within frame of the adverse physical conditions. Because, the Engineer grounds its decision on the opinion that during this process the Contractor can deal with other works in his workplace and therefore a circumstance to effect duration of work is not established. Consequently, this article does not release the risk much from the Contractor. Whereas, in GSPW damages and losses caused by the natural disasters at the workplaces are accepted as the insurable risks that can be covered by the insurance (all-risk) and these natural disasters are not indicated as adverse physical conditions in the contract provisions. Therefore the Contractor cannot claim cost compensation for such damages and losses but extension of time is allowed to the Contractor. In GSPW contract, the contract can be terminated due to natural disasters if it should exceed the Contractor's capacity to overcome. In this case, the accounts of the contract shall be wound up in accordance with general provisions and performance security and any supplementary security shall be returned to the Contractor. However, in FIDIC contract, termination of contract is not stated in case of adverse physical conditions.

### 6.2.3. Subcontracting

Normally there will be one main or principal contractor who signs the Contract and has overall responsibility for the execution and completion of the project. The award of the contract implies confidence of the Employer in the Contractor. Obviously, it is not envisaged by the Employer that the Contractor he has selected would assign the contract to a third party. The FIDIC and GSPW

conditions provide that the contract may not be assigned in whole or in part without the express consent of the Employer.

Subcontracting of certain specialized parts of the work undertaken by the Contractor is not an unusual occurrence in the execution of a contract. Employer wishes to have the contract carried out by the Contractor he has selected. However, it is generally recognized that the other persons or firms, by reason of their greater specialization, experience or capacity, may be able to carry out specific works or services or furnish certain supplies, more efficiently than the Contractor. Accordingly, the Contractor may subcontract works, services or supplies to others under the both FIDIC and GSPW conditions. The responsibility of the Contractor to the Employer for the entire contract remains and the Contractor retains responsibility for the work or services which he subcontracts. It is the duty of the Contractor to justify the need, for such specialization.

Respondent B states that in the subcontractor clause of FIDIC, there is also a nominated-subcontractor. This subcontractor means subcontractor approved by the Employer. The Employer can make direct payment to this subcontractor. Contractor can't delay the payments to this subcontractor. Or otherwise, the Employer protects the rights of this subcontractor. And this is an issue that the Contractor must be careful about.

FIDIC provisions provide the Contractor to approve of the nominated subcontractor and to be prepared to collaborate with him. The Contractor can refuse the nomination if he has reasonable grounds for doing so. If the Contractor declines to enter into a subcontract with a nominated subcontractor, the Engineer will have alternative lines of action open to him. He can:

- nominate an alternative subcontractor, or
- modify the terms of the subcontract, or
- arrange for the Contractor to carry out the work himself through a variation under valuation of variation clause.

It is important that serious difficulties can arise if the Contractor fails or refuses to pay at the appropriate time the amounts to a nominated subcontractor. The Employer may pay the nominated subcontractor directly and recover the amount from the Contractor, possibly by deduction from payments to be made to the Contractor by the Employer.

### 6.2.4. Contract Documents

The Contractor will normally have provided an outline programme with his tender followed by a more detailed programme. With this information available to him the Engineer can organize the issue of drawings and other information to meet the Contractor's requirements.

On some occasions the Engineer may not himself have the responsibility for preparing such drawings or information but will be the channel through which such drawings or information are passed to the Contractor under both conditions. It is customary for all drawings and information to be supplied in reproducible form. Some drawings, specification or other documents may be provided by the Contractor. For example, prefabricated elements to be manufactured according to proprietary methods of the Contractor or where it is provided in the contract that design of a part of the permanent works is the responsibility of the Contractor (Guide to the use of FIDIC, 1989).

Under conditions of FIDIC, if the progress of the Contractor's work is likely to be hampered because of late issue of drawings or instructions by the Engineer it is important that the Engineer should be informed by the Contractor that the late issue will have certain cost and time effects. If the Contractor is delayed or involved in extra costs as a result of late issue of drawings or instructions, the Engineer shall, after due consultation with the Employer and the Contractor, determine any extension of time to which the Contractor is entitled and the amount of such cost that shall be added to the contract price. However, in GSPW contract the duration of work shall be extended to meet such delay if this delay makes it compulsory to grant time extension for any part or the whole of the

work but there will not be cost compensation. Moreover, the Engineer supplies the contractor with the essential information that consists of necessary data on which the Contractor should base its works. Under FIDIC conditions, rectification costs resulting from incorrect data supplied by the engineer are recoverable by the contractor from the employer if it should be established that the data supplied by the engineer is incorrect. In GSPW there is not any clause that clarifies such a condition resulting from incorrect data caused by Engineer.

Respondent A argues that in FIDIC contracts Employer requests from the Contractor a workshop drawing before contractor begins working and contractor begins to work only after this project is approved. It also demands prior Check Request from 24 hours before for each work he is to perform. In such a case the Contractor becomes responsible from the project he has implemented. In addition, approval of Engineer does not release the Contractor from responsibility. Therefore this means that the employer transfers his responsibility he assumes for the Drawing Part, to the Contractor by this way.

### 6.2.5. Insurance

Under FIDIC conditions, although the insurance is to be for full replacement cost, it is not always necessary to insure for the replacement of an entire project, particularly if there is a wide geographical spread of work or if, for some reason, it is felt that it would never be necessary to replace the whole of the project. It is the intention that a First Loss value that is a sum less than the full value of the project would be acceptable, but sufficient to provide for the cost of repair of the most serious damage envisaged. Modern practice is to avoid the problems of two parallel policies applying to the same project, by having a single policy in the joint names of both parties, and insuring each party for his risks. FIDIC conditions provide for this and has the effect of making the Contractor responsible for insuring against all risks that can be insured (Guide to the use of FIDIC, 1989).

The insurance of the works is to be in the joint names of the Employer and the Contractor. However, during the Defects Liability Period the insurance is only against that damage which the Contractor is required to repair under the terms of the Defect Liability clause, and so the Employer has no insurable interest in this part of the policy. Therefore this section of the insurance could be in the name of the Contractor alone. Similarly, the Employer may not have an insurable interest in the Contractor's equipment, and so this is insured in the name of the Contractor. The employer has no responsibility for injuries that may be suffered by employees of the Contractor, unless such injury results from an act or default of the Employer. It is possible that damage or injury may be suffered by a third party as a result of the negligence of the Employer and it is reasonable that the Contractor should not be required to indemnify the Employer in these circumstances (Guide to the use of FIDIC, 1989).

In GSPW, the Contractor shall be liable to arrange (all risk) insurance as indicated in the tender document against the risks such as earthquakes, floods, landslides, storms, fires etc. natural disasters that may occur in the period from the date of commencement of work until the date of final acceptance. Respondent B gives a case, for example, Contractor sits at the table with the Insurance Company while making All-Risk. For instance, a project which costs 100 Million Dollar and lasts for 3 years requires on insurance value of 1 Million Dollar. The Contractor can insure this job on yearly basis instead of single 3 year period insurance. The major aim of the Contractor is to insure the works completed only in the year of which the insurance is valid for. The works to be done in the second year will be covered in the scope of the insurance of the second year. The Contractor can exclude the works of the first year from the insurance scope of the second year. For example, the Contractor transports material from quarry to work site within first year. Scope of insurance includes this transportation of materials within the first year. In the second year, the Contractor will not transport materials from the quarry. Therefore, the Contractor can exclude transportation of materials from the insurance scope of the second

year. Consequently, Contractor and the insurance company can decide on the works to be insured for each year and they perform a risk analysis for the specified issues.

### 6.2.6. Materials, Plant and Workmanship

The Engineer may require the Contractor to carry out tests and the Contractor is obliged to carry out such tests but under conditions of FIDIC if the tests do not reveal the Contractor's work to be deficient the Contractor will not have to bear the costs of carrying out such tests. The Engineer can determine, after consultation with the Employer and the Contractor, to what additional cost and extension of time the Contractor shall be entitled in respect of tests additional to those specified in the contract. However the costs of the load and similar technical tests stated in the GSPW contract and annexes will be borned by the contractor. There is no explanation that indicates who will bear the costs if the tests shows the Contractor's work to be in accordance with the provisions of the contract.

Under FIDIC conditions, arrangements must exist for the Engineer to inspect work which is to be covered up. Work shall not be covered up before the Engineer has had an opportunity to examine and measure it, and the Contractor has the obligation to call upon the Engineer for that purpose. The Contractor should not be unreasonably delayed in proceeding with his work because of delay by the Engineer in carrying out this task and the Engineer is obliged by the conditions to attend without undue delay. The Engineer may require, as a consequence of later discovery, that work already covered up be uncovered and inspected and tested. If this opening up is found to be executed in accordance with the contract, the Engineer shall determine the amount of the Contractor's costs for extra work.

Generally, when tests have shown no failure, interim payment has been made and work has proceeded normally, and only at a larger stage if it is realized that the work fails to meet the requirements of the contract, the Engineer should

investigate with the parties to the contract whether an acceptable solution can be found on the basis of redesign and adjustment of payment. In such case the instructions to remove the faulty work should be an exceptional remedy and again the Engineer should specify a reasonable time for the Contractor to act (Guide to the use of FIDIC, 1989).

### 6.2.7. Claims

Frequently claims have been made when the project has been completed and the workforce has been dispersed and then both the Employer and the Contractor are dependent upon incomplete records and inevitably regard their memories of the events as being indisputable. As their respective memories are rarely identical it is understandable that they are both dissatisfied with the outcome (Guide to the use of FIDIC, 1989).

Respondent B states that the Contractor is required to give notice to the Engineer within 28 days after the event giving rise to the claim has first arisen under FIDIC provisions. This is a practical requirement and not difficult to comply with. Contractors will generally maintain a site diary and will have noted therein when the event first arises. If the Contractor does not comply with time limits in the conditions, his entitlement to payment may be limited. In GSPW there is no such a certain limitation of time. However, for insurance it must give notice within 3 days at latest. Also in GSPW objection should be done within a certain time period. Since, the Employer has to investigate promptly the subject matter which is the reason of objection. Delayed objections may not give positive results for the Contractor or it may take a long time to investigate and bind it to a decision. And, this of course, is a loss of time and money for the Contractor.

According to the Respondent B, in GSPW, when the Contractor makes his claim he must describe according to which provision of the contract he exhibits his objection and to which part or item of the work he objects. Attached to it, he also must explain in detail in his claim how the Contractor suffers a loss and the time or money, he is to claim as materially. Otherwise, his claim would not be

considered as valid. Whereas, in FIDIC reasons of claims should be described in detail in the same manner. Besides, in FIDIC a file is established, too. This file contains all of correspondences. When any objection is forwarded or any application is made to arbitration, correspondences in the said file are much of significance. Contractor shall not have any right of objection or arbitration for any subject not taking place in this said file or for any issue which there is not any written document on this issue in the correspondences.

### 6.2.8. Delays and Extension of the Duration of the Work

The Employer must give the Contractor possession of the site at the same time as the Engineer gives the notice to commence the works. Delay may result in deferral of the date when the works reach substantial completion and also in extra cost to the Employer. If the Contractor suffers delay and/or incurs costs from failure to give possession of the site, Engineer shall determine amount such costs and extension of time that the Contractor is entitled under FIDIC conditions. However, if there is delay in the handover of the worksites to the contractor and this delays the completion of part or whole of the work, the duration of work set forth in the contract shall be extended to meet such delay for part of whole of the work but the Contractor is not entitled additional cost under GSPW conditions.

In FIDIC type of contract, the granting of an extension of time is based on the Engineer's interpretation of the contract and his assessment of the circumstances involved during the execution of the works and the basis for the claim stated by the Contractor in his notification. It should be noted that the Engineer makes his determination after consultation with the employer and the contractor. The granting of an extension of time, to which the Contractor may become entitled, might arise from such factors as delay in obtaining possession of the site, delay in the issue of drawings or instructions, adverse physical obstructions or conditions, suspensions, extra work or damage or delays to the works.

Respondent B stressed that the Employer also has the right to forward objection for the time extension the Engineer has granted.

In GSPW type of contract, if the delay set forth in the contract are not attributable to the Contractor due to force major reasons or the situations engendered by the Employer, this case shall be reviewed by the Employer, and the duration concerning part or whole of the work shall be extended to meet such delay according to the reasons delaying the work and the nature of work that will be carried out. According the Respondent B, in GSPW in case the Contractor has any contradiction with the Employer on time extension issue, he can use his right of objection. However, in such a case the Employer may take such decisions to cause disturbance or loss to Contractor since, relations of the Employer with Contractor are spoiled accordingly. This fact shows that Contractor firms in Turkey now do not use their right of objection in order not to spoil their relations with the Employer.

Under FIDIC conditions, if the rate of the progress of the works is at any time too slow to comply with the time for completion for any reason which does not entitle the Contractor to an extension of time, the Engineer shall notify the Contractor to expedite progress so as to comply with the time for completion. Any additional supervision costs incurred by the Employer due to steps taken by the Contractor to expedite progress pursuant to a notification by the Engineer may be recovered by the Employer from the Contractor. There is no similar clause in GSPW that reveals the circumstances under the rate of the progress of the works.

The amount of liquidated damages is determined by the Employer, before tenders are invited, as a reasonable assessment of the actual damages which he would suffer in the event of delay in completion of the works. Therefore, tenderers are aware of the nature of their commitment at the time of tendering. In both FIDIC and GSPW, if the contractor fails to complete and deliver the work tendered for acceptance within the duration set forth in the contract, the daily

delay penalty set forth in the contract shall be applicable for each delayed calendar day.

### 6.2.9. Alterations, Additions and Omissions

Under FIDIC contracts, the Engineer instructs the Contractor to make a variation order when the Engineer determines to make a change in the works from that envisaged in the drawings and other contract documents upon which tenders are based. A variation may in exceptional cases also be necessitated by a default of the Contractor but, in such case, the resulting cost is necessarily borne by the Contractor. A variation will normally have cost consequences and the Employer should be kept fully informed by the Engineer. Even if the variation can be carried out within a budget agreed by the Employer, he may require the opportunity to approve the instruction before it is given to the Contractor. The contract should establish a procedure for such approval (Guide to the use of FIDIC, 1989). The steps in such a procedure could be:

1. The Engineer prepares an authorization request with proposed variations to the specification and contract quantities as well as an estimate of cost together with the basis and justification for the variation.

2. After the authorization request has been approved by the Employer, the Engineer negotiates with the Contractor to determine the price of the variation. If the price is equal to or less than the amount sanctioned by the Employer, the Engineer is authorized to issue the necessary instructions for the variation to the Contractor. If the price is more than the sanctioned amount the Engineer should seek further authorization from the Employer.

3. Irrespective of the procedure described above occasions will arise when it will be necessary for the Engineer to issue an instruction for a variation prior to reaching an agreement with the Contractor as to price, in order to avoid delaying work. Under such circumstances a two part instruction for

the variation will be issued, the first part instructing the Contractor to proceed with the work without stating the rates and prices, and the second part to be issued after further negotiations stating the rates and prices applicable.

4. In an emergency the Engineer shall not be restricted from issuing such instructions to the Contractor as the Engineer considers necessary. If he acts in such an emergency he shall inform the Employer as soon as possible having regard to the circumstances.

However in GSPW contracts, variations may required on when this variation is not technically and economically possible to separate additional work from the main contract without burdening the Employer,

The Employer may have the same contractor perform the work increase up to the amount of 10 % of the main contract's price in turn-key lump-sum works contracts and up to the amount of 20 % of the main contract's price in unit price works contracts in accordance with the provisions specified in the original (main) contract and tender documents except the provisions on contract duration.

Respondent C states that if the nature or amount of the work involved differs so much from that included in the original contract that the rates and prices are rendered inapplicable, it is the Engineer's task to agree appropriate rates and prices with the Contractor, or, if agreement cannot be reached, to fix the rates and prices under conditions of FIDIC. Existing rates and prices shall be used as a guide for the valuation as far as reasonable. Failure to reach agreement should not prevent the Contractor from receiving a payment on account of for the work in question. Whereas in GSPW, it is the Employer' task to determine appropriate rates and prices with the contractor within a framework of the following methods:

a) Analyses to be found by comparing with the analyses submitted by the contractor in his tender that are similar to the new work items;

b) Analyses of work items those are similar to the new work items available at the Employer.

c) Analyses established on the basis of the amount of materials to be determined according to the grading that will be made during the performance of the new work items and the analyses created on the basis of the working hours of the personnel and machinery.

### 6.3. Contractual Rights of the Contractor

Respondent C states that one of the greatest differences between FIDIC and GSPW contracts are that Contractor's rights have not been indicated in the GSPW contract. Whereas, in FIDIC rights of Contractor have been clearly pointed out. In GSPW contract, in case the Contractor can not collect his receivables, he does not have any rights. Whereas, in FIDIC the Contractor has such rights like, terminating the contract, collecting his money back with due legal interests within certain time period or time extension and recovering additional money to compensate for losses due to not being able to collect his money. In GSPW contract, he does not have any right of termination as well as there is not any condition on when he is to collect his money back. He can obtain only a time extension right whereas; during this course of time he has to incur costs.

Generally, the contractual rights of the Contractor that are specified in payment clauses, default of Employer clause, changes in cost clause and suspension of the works clause in the GSPW are not clear when it is compared to the FIDIC contract. Respondent B states that this fact creates a risk for the Contractor from this point of view. Since, the Employer can take decisions by its initiative without being restricted by any provision of contract under such circumstances; it provides meanwhile a great comfort for the Employer, too. The following paragraphs will mention how these clauses create a risk from Contractor's point of view and what kind of differences are revealed in the risk management strategy of the contractor.

### 6.3.1. Payments

In recognition of the importance to the Contractor of a predictable and prompt flow, payments are to be made monthly on the basis of statements submitted by the Contractor and checked by the Engineer. Conditions of FIDIC contain strict stipulations regarding the time allowed to the Engineer for issuing the payment certificates. It is the contractual obligation of the Engineer to issue the progress payment certificate within 28 days after the Engineer has received payment statement given by the Contractor. If the Engineer is not satisfied of any particular item included in the Contractor's monthly statement, he can omit any item in the statement or can include some items in later monthly certificates when he is satisfied. The Employer has to make payment within 28 days after the interim certificate has been delivered to him. In case the Employer is liable to pay interest on the amount over due. Moreover, the Contractor may suspend work or terminate his employment under the contract.

Under GSPW conditions, progress payment that is drawn up and signed by both Contractor and the Engineer can be corrected by Employer until the accrual and payments that are signed by both parties shall accrue within thirty days by the Employer. The payment shall be made within fifteen days as from such date. However, the Contractor's entitlement in an event of failure by the Employer to make payment within specified time is not stated in the contract.

### 6.3.2. Taking-Over Certificate

ın FIDIC contract, after the satisfactory completion of all works and passing any tests on completion, the Contractor may give notice to the Engineer by a written document. This document states the request of the Contractor for the issue of Taking-Over Certificate. In addition, the Engineer shall issue Taking-Over Certificate within 21 days of the date of delivery of Contractor's notice. The engineer can give instructions in writing to the contractor specifying all the work which is required to be done by the contractor in the Engineer's opinion before the issue of such Certificate. The contractor shall be entitled to receive such

Taking-Over Certificate within 21 days of completion, to the satisfaction of the engineer, of the works so specified and remedying any defects so notified.

Whereas in GSPW, when the work under the contract is completed, the Contractor shall apply to the Employer with a petition containing the demand for Taking-Over Certificate. If the Engineer finds out that the works are completed in compliance with the Contract the Employer shall establish an Acceptance Commission. If the work is approved by the Acceptance Committee after the inspection with the Contractor, an Acceptance Protocol shall be drawn up and signed by the Contractor. The temporary Acceptance Protocol shall be valid only after it is approved by the Employer. Under GSPW conditions no specified time period is stated on when the Contractor is entitled to receive Taking-Over Certificate. Moreover, after the approval by the Acceptance Committee, the Employer shall issue the certificate.

The period of 84 days is allowed to the Contractor after the issue of the Taking-Over Certificate in respect of the whole of the works to produce the statement at completion under FIDIC conditions.

### 6.3.3. Default of the Employer

In the event of the Employer:

(a) failing to pay to the Contractor the amount due under interim payment certificate of the Engineer within 28 days after the interim payment certificate has been delivered to the Employer or; failing to pay the amount due under final certificate of the Engineer within 56 days after the final certificate has been delivered to the Employer,
(b) interfering with or obstructing or refusing any required approval to the issue of any such certificate,
(c) becoming bankrupt or being a company, going into liquidation,
(d) it is impossible for him to continue to meet his contractual obligations for unforeseen reasons due to economic dislocation,

the Contractor can terminate his employment under the contract by giving notice the Employer under FIDIC conditions. The termination takes effect automatically 14 days after such notice is given to the Employer. In GSPW contract, the Contractor do not have right to terminate the contract in case of default of the Employer.

Under FIDIC conditions, in the event of such termination the Contractor shall be paid by the Employer, insofar as such amounts or items have not already been covered by payments on account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the contract and in addition:

- the cost of materials, plant or goods reasonably ordered for the works which have been delivered to the contractor which the contractor is legally liable to accept delivery of such materials, plant or goods,
- a sum being the amount of any expenditure reasonably incurred by the contractor in the expectation of completing the whole of the works,
- such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, of removal of contractor's equipment,

In GSPW contracts, contract can not be terminated due to default of the Employer. For the contract be terminated due to natural disasters, legal strikes, epidemic cases, announcement of partial or general mobilization and other similar circumstances that may be determined by the Public Procurement Authority when necessary; it should not result from a fault of the contractor, should exceed the Contractor's capacity to overcome and should be documented by competent authorities. In this case, the accounts of the contract shall be wound up in accordance with general provisions and then retention money shall be returned.

### 6.3.4. Suspension

Only under FIDIC conditions, Engineer has authority to suspend the progress of the works and the Contractor shall, on the instructions of the Engineer, properly protect and secure the works during such suspension. The Engineer shall determine what extension of time and/or extra costs the Contractor shall be entitled to receive if he is not responsible for the suspension. If the progress of the works or any part thereof is suspended for 84 days then, unless the Contractor is responsible for the suspension, the Contractor may, by notice to the Engineer, require permission, within 28 days, to proceed. If such permission is not granted, the Contractor may elect to treat the suspended work as omitted or, where all work has been suspended, treat the contract as repudiated. Suspension clause is not stated under the conditions of GSPW.

### 6.3.5. Changes in Costs

For contracts of short duration, e.g., one year maximum, it may be reasonable to require fixed prices. Thus, the contract price shall not be subject to any adjustment in price in respect of rise or fall in the cost of labour, materials or any other matters affecting the cost of execution of the contract. For contracts of longer duration, adjustments of prices should be allowed. Therefore, the net increase in the cost of labour and materials, consumables, etc., arising after a date when tenderers can be assumed to have completed the computation of the rates and prices inserted in their tenders, should be assessed and the contract price adjusted accordingly for short duration of contracts.

Respondent A states that FIDIC does not give any price difference for tenders which are not longer than 2 years. It grants price difference for contracts longer than 2 years provided that this provision takes place in the contract. Whereas, in GSPW a yearly unit price difference is given. Liquid fuel difference is included this, too. Therefore, this is an advantage for the Contractor when the work is executed in accordance with GSPW contract.

### 6.4. Settlement of Disputes

If there is a difference of opinion between the parties to the contract that is, between the Employer and the Contractor, it is probable that such difference of opinion will have arisen as the result of an instruction given by the Engineer. If the matter cannot be clarified to the satisfaction of both parties, either may in the first instance refer the dispute to the Engineer for a decision. Conditions of FIDIC contain an agreement between the parties to take two steps before entering into arbitration. First is to submit the dispute to the Engineer for his decision and second is to attempt to settle the dispute amicably between them if such decision is not acceptable. The amicable settlement is essentially a process to be left to the Employer and the Contractor. Assistance may be called for from the Engineer, where appropriate. If the parties can discuss and agree upon a solution to matter in dispute between them, this will have many advantages over going to arbitration. However, arbitration may be commenced 56 days after a notification to that effect, whether or not the second step has been taken.

In selecting the place of arbitration the parties should consider, among other things, the neutrality of the location, the suitability of local law and the administration services available. If no place of arbitration is stipulated then, under the Rules of Arbitration of the International Chamber of Commerce (ICC), the place would be chosen by the ICC Court of Arbitration (Guide to the use of FIDIC, 1989).

Under GSPW contract, when the disputes arise between the Contractor and Engineer during the performance of work the Contractor shall apply to the Employer with a petition including the claims and complaints within fifteen days following the date of occurrence of this situation in respect of the issue that causes the dispute. The Employer shall review the issue within two months at the latest following the date of receipt of this petition and submit the resolution on this issue to the contractor.

Respondent B believes that in case of arbitration, relation between contractor and Employer is spoiled. In such cases, the Employer begins to think negatively about the Contractor. According to Respondent B, in case of arbitration, Contractor can request his country's laws to be applicable. However, such a fact has to be pointed out in the contract provisions or included in the contract prior to signing of contract. Whereas, when such an event occurs, Foreign Firms lose their desire to participate in the tender. Because, examining a country's laws and regulations requires additional time and money. For this reason, foreign firms would not like to include such provisions in the contract.

Respondent A states that in FIDIC, the Engineer should give notice of his decision to the Employer and the Contractor within 84 days. If the Employer or Contractor is dissatisfied with the decision, either party has to give notice within 70 days after receiving the Engineer's decision. Otherwise it do not have the right to go to arbitration. In GSPW, in case decision of Employer does not satisfy Contractor, the Contractor can apply to the Courts of the Republic of Turkey. Contractor always have the right to apply to the Courts. Whereas, this do not exist in FIDIC. Turkish Tribunals apply to an expert witness to bring the result under a decision. Report of such an expert witness is very influential in judging the decision. Whereas, in FIDIC decision is judged by the international arbitration. Employer and Contractor each have respectively the right to appoint arbitrators who are members of FIDIC. These two arbitrators assign the third arbitrator who is again a member of FIDIC. Then, these three arbitrators exhibit a judgment on the issue which caused the dispute. Respondent A explicitly specifies a critical point. The Contractor can include in the Contract Appendix a provision saying that Judgment of Arbitration shall not be binding. For instance, Turkish firms, performing Works in Turkey under FIDIC contract, include in the contract appendices the provision saying that decision of Arbitration is not a binding decision and that the Laws of the Republic of Turkey are applicable in works that will be executed during the project.

### 6.5. Tendering Stage

Tendering stage is intended to assist the Employer and Engineer to receive competitive tenders that can be quickly and efficiently assessed. Moreover, it provides the opportunity and incentive for Contractors to respond easily to invitations to tender for projects they are well qualified to implement. To achieve optimum results, it is essential that when tenders are invited, tenderers are not expected to cover in the rates they quote for risks which they could not foresee or evaluate at the time of preparation of their tenders (Guide to the use of FIDIC, 1989).

Respondent A emphasizes the tendering stage by giving reference to a case. Respondent A states that, let X be a country, and let this country to have a credibility of 1 Billion Dollar by the World Bank. On the other hand, let Y be an international finance organization. Country X proposes three projects to be implemented in its country to finance organization Y. Let these projects be for instance, a dam project, an irrigation project and a factory installation project, respectively. Finance organization Y looks at the rating of country X at first instance. Then, it learns how much credibility the country has been rated by the World Bank. Later on, it applies to an Expert Individual Consultant for the preparation Appraisal Report of these three projects. The Expert performs assessment of these three projects. He finds answers to questions such as, which project can be completed in how many years, what are the costs of these projects, in how many years country can X pay back the credit granted by finance organization Y. He submits a report to finance organization Y at the end of such work. Finance organization Y concludes a Loan Agreement with country X regarding the project it has selected according to the said report. Then, a Feasibility Study and Preliminary Design is performed with an expert approved by country X and finance organization Y. After this step, Final Design and Preparation of Tender Documents are completed. In the next step, the process of Construction Supervision meaning, Evaluation of Tender Documents begins. At the end of these, the phase of contract negotiations begins where the Employer,

Consultant and Contractor participate in. In these negotiations, issues such as, including some addendum clauses in some of articles in the specifications (FIDIC), deleting some of articles in FIDIC and replacing articles containing some other provisions instead of those, are taken under decision. Lastly, Execution, Guarantee Period and Operation processes are completed. At the completion of work, financier Y requests from Client X a certificate evidencing that Client X has fulfilled its undertaking which it is liable of performing against the credit received by Client X and granted by financier Y. Purpose of this is to be sure about the fact that the granted credit has been used for the right purpose. Use of FIDIC as the contract between the Contractor and the Employer assures that the money provided by the financial organization is allocated in an effective and efficient way.

Apart from contingency calculations to account for risk factors, Respondent A focuses on 3 important subjects that should be considered during bid preparation. These are,

1. Where does the financial source come from?

2. In which country will the work be performed?

3. Where is the money paid by the Employer deposited during the project duration?

Respondent A emphasizes these subjects by giving an example. According to Respondent A, let X be a Turkish firm. Let this firm be awarded a contract in Afghanistan. Let the Financial Source of the employer who makes the work performed in Afghanistan be the World Bank. Meaning, let the employer receive the money required for this work to be performed, from the World Bank. Let's say that the Turkish Firm X requests that its monthly progress payments and all of payments it is to receive from the employer, be deposited to its account by a Swiss Bank. Contractor will perform the Work under FIDIC conditions. When the Republic of Turkey demands tax from the firm X, the firm X will not pay any tax due to such reasons like, the source of the money is not the Republic of

Turkey, the work is not being performed in Turkey and the money is not being deposited by any Turkish Bank. Tax code, under which the firm X is liable, is the tax code of Afghanistan.

In the second question of the interview form, the table, showing the differences between the contract provisions of FIDIC and GSPW, is demonstrated to respondents and they are inquired to comment on the conditions about which differences are more important and should be taken into consideration in terms of risk management. Table 3.3 illustrates the most important differences between the contract provisions of FIDIC and GSPW according to the respondents.

Table 3.3. Important differences between FIDIC and GSPW Contracts

| **SUBJECT** | **FIDIC** | **GSPW** |
|---|---|---|
| Adverse Physical Obstructions | • extension of time to be allowed to the contractor<br>• any additional costs to be added to the contract price | No specification that explains the situation |
| Suspension of Work | • extension of time to be allowed to the contractor<br>• any additional costs to be added to the contract price | No specification that explains the situation |
| Rate of Progress | • contractor shall take necessary steps to expedite progress of the works<br>• there is no additional cost | No specification that explains the situation |
| Default of the Employer | • contractor can terminate the contract | Contractor can not terminate the contract |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Arbitration | • amicable settlement<br>• arbitrators shall be appointed under the rules of international Chamber of Commerce | • contractor can apply to the Courts of Republic of Turkey |
| Contractor's Entitlement to Suspend Work | • extension of time to be allowed to the contractor<br>• any additional costs to be added to the contract price | Contractor can not suspend the Work |

It is observed that all of the respondents are aware of the fact that FIDIC is an international specification prepared upon request of the World Bank. Aim of the World Bank is to ensure the credit it grants be used in the right way and for the right purposes by the Employer. Financing establishments anticipate that the money they give is used in compliance with its purpose due to FIDIC. Moreover, all the respondents state that it is more advantageous for the Turkish Contractors to use GSPW while performing work in Turkey. Because, FIDIC causes the parties to exhibit correspondences to each other continuously and good relations may be spoiled from the beginning of work. If main purpose is the performance of work under good relations between parties, FIDIC exhibits difficulties for the parties. Reason for this is that, since parties need written evidences to claim any right in case any dispute arises in the future, they have to exhibit letters to each other for all of the problems, even in the most minor problem though. Both parties can go to arbitration only through the file they establish at the end of work or in case of any dispute. And this fact causes the parties to exhibit mutual correspondences continuously and good relations between them may be spoiled. Therefore, some suggestions to the Contractors that execute work under FIDIC and GSPW contracts will be given in the following section.

### 6.6. Suggestions

- The standard forms of main contract require the Contractor to give notice when delays occur in the progress of the works. However, in FIDIC, Engineer has right to make an extension if the Contractor fails to give notice. The requirements to give notice under FIDIC are not, therefore, conditions precedent to the Contractor's rights to an extension time. Where a Contractor fails to serve a proper delay notice this will not result in the loss of rights to an extension of time unless the contract expressly states a period within which notice is to be served and that the service of a notice is a condition precedent to the right to an extension of time.

- It is essential if the Contractors are to avoid the risk of losing their rights, to ensure that written notices are as required by the contract and served in a correct and timely manner. The wording of the clause with regard to what details must be included in the notice may be sufficient clear to avoid uncertainty. Disputes generally arise when the Contractor does not state the clause of the contract on which his claim is based on. If the Contractor does not notice his claim within the specified time period, he may lose his contractual rights. The engineer has right to demand further information from the Contractor when investigating the claim.

- The correct manner of presenting a claim before a court or arbitrator is to link the cause with the effect. For example, if the Engineer is 6 weeks late in issuing the drawings for the foundations (cause) the completion date for completion of the work may, as a consequence, be delayed by 6 weeks (effect). In the recent time Contractors have been ever willing to short cut need to link cause and effect by use of the global claim. All causes of delay under the global claim method are lumped together and one overall delay given as a consequence. The usual requirement to link each cause of delay with its separately identified additional cost is ignored. A case, for instance, the contract overrun by 46 weeks in

Portland. The arbitrator held that the contractor was entitled to compensation in respect of 31 weeks of the overall delay, and he awarded the Contractor a lump sum by way of compensation rather than giving individual periods of delay against the nine delaying matters. By way of justification the arbitrator in his findings said: "The result, in terms of delay and disorganization, of each of the matters referred to above was a continuing one. As each matter occurred its consequence were added to the cumulative consequences of the matters which had preceded it. The delay and disorganization which ultimately resulted was cumulative and attributable to the combined effect of all these matters. It is therefore impracticable, if not impossible, to assess the additional expense caused by delay and disorganization due to any one of these matters in isolation from the other matters". Therefore preparation and presentation of claims will need to work hard with those who have first-hand knowledge of the events so as to provide an adequate description of them. Equally, it will mean that proper records will need to be kept or good use will have to be made of existing records to provide the necessary detail. It will be no longer be possible to call in an outsider who will simply list all the possible causes of complaint and give details of the consequences of those complaints .

- Most prudent Contractors will allow some form of contingency in their programme. Risk analysis is becoming a frontline science in construction projects. More of the risk and hence uncertainty is being placed upon Contractors. Unfavorable ground conditions, strikes, weather conditions, shortages of labour and materials are now regularly allocated in the contract as a Contractor's risk. The Contractor will normally include float in his programme to accommodate his risk items which cannot be accurately predetermined in terms of time involvement, and also to provide time for correcting mistakes.

- The programme is usually intended to be a flexible document. If the Contractor has behind the as-planned schedule, he would normally expect to revise the programme in an attempt to make up lost time. For this reason programmes are not listed as contract documents. Conditions of FIDIC empower the Engineer to require the Contractor to produce a revised programme if progress of the work does not conform to the accepted programme. The revised programme must show the modifications to the accepted programme to ensure completion on time. Also, there is no restriction placed upon the Contractor who wishes to revise his accepted programme. In the absence of an express requirement to seek approval to amend, the Contractor can revise his programme. If the Contractor do not make request to approve his or her amended programme, the Engineer has no obligation to issue the drawings within specified time to enable the Contractor to comply with Contractor's revised programme.

- It is essential for the Engineer to make it clear to both Employer and subcontractor exactly what he is doing with the drawings if he is not checking the design. If he is checking the design carried out by the subcontractor or supplier he may find that even though the terms of his appointment exclude responsibility he may have adopted a post contract amendment to the conditions. The Employer will be left to bring an action against Engineer or the subcontractor who carried out the design. The approval of a Contractor or subcontractor's drawings by the Engineer will not usually relieve the Contractor or subcontractor from liability. Employer who incurs costs due to this type of error will normally commence an action jointly against the Contractor or subcontractor who prepared the drawings and the Engineer who gave his approval.

- Contractors who are required to carry out work regularly and diligently must go about their work in such a way as to achieve their contractual

obligations. This requires them to plan their work, to lead and manage their workforce, to provide sufficient and proper materials and to employ competent tradesman so that the works are fully carried out to an acceptable standard and that at all times sequence and other provisions are fulfilled.

- FIDIC conditions provide the Engineer with power to instruct the contractor to demolish and remove work which does not comply with the contract. Conditions of FIDIC states that, provided that where the issue of an instruction to vary the works is necessitated by the Contractor, any additional cost shall be borne by the Contractor. Therefore, if such default resulted in higher maintenance or running costs, the Employer may have a remedy against the Contractor. The employer will be entitled to recover the cost of rectification if work carried out by a Contractor is defective. However, if rectification is not a reasonable solution to the defective work due to high cost compared with benefit, rectification costs will not be awarded. A case, for instance, the dispute concerned the construction of a swimming pool, the maximum depth to which the pool was constructed 6' 9", which differed from the 7' 3" depth which was specified. The trial judge had found that the pool as constructed was safe to dive into and that the deficiency had not decreased the value of the pool. Damages for loss of amenity of £2,500 only were awarded in case of to reconstruct the pool at a cost of £21,560. Therefore, a failure to achieve a contractual objective does not necessarily mean that there is a total failure. In the instant case, it was a perfectly serviceable pool, even if it was not as deep as it should have been.

- The procedure governing Contractor's claims is laid down in the following paragraphs and is applicable to both claims for additional payment and claims for extensions of time. This procedure is as follows:

- Should the Contractor consider himself entitled to an extension of the time for completion or additional payment, under any clause of these conditions or otherwise in connection with the contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable and not later than 28 days after the Contractor became aware of the event or circumstance. This initial notice is only a bare notice putting the Employer on notice that he may have to pay the Contractor additional money or award him an extension of time by reason of a specified event or circumstance.

- In the event that the Contractor fails to give notice of a claim within such period of 28 days, the Contractor shall not be entitled to additional payment and the Employer shall be discharged for all liability in connection with the claim.

- The Contractor shall keep such contemporary records as may be necessary to substantiate any claim either on the site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any notice, monitor the record keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall summit copies to the Engineer.

- Within 42 days after the Contractor became aware of the event or circumstance giving rise to the claim or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and the extension of time and/or additional payment claim. After receiving a claim or any further particulars supporting a previous claim, or within such period as may be proposed by the Engineer and approved by the

Contractor, the Engineer shall respond with approval, or with disapproval. 4th Edition FIDIC contract has not required the Engineer or Employer to reply to a claim within a stated time period.

- Tenderers are usually given a limited period in which to prepare tenders and it is impracticable, and in many cases impossible, for them to carry out a full site investigation programme, particularly sub-surface exploration involving drilling in the time available. Contractor should visit the site and collect such other information as may be required for the preparation of his tender. The Contractor will be expected to have checked upon the availability of the materials and the labour he needs to execute the works. Sufficiency of tender clause of FIDIC and GSPW contracts emphasizes that the tender is deemed to have made a thorough investigation of the site and its surroundings as far as is practicable within the time allowed for the preparation of his tender.

- In FIDIC contracts it is the practice that the Engineer deals directly with the subcontractor on technical matters with the agreement of the Contractor. In such case it is essential that the Contractor is kept informed at all stages, particularly if matters of payment or programme are involved, so that the Contractor is immediately aware of discussions or correspondence that have taken place between the Engineer and the subcontractor and can comment or take such other action as he may consider appropriate.

# CHAPTER 7

# CONCLUSION

The general contractor in today's construction world has an important and responsible function to perform when he accepts a contract. Contractors have to construct the projects efficiently in accordance with the contract provisions while meeting the aesthetic and functional requirements. In addition, all construction projects involve risk and there is no possibility to eliminate all the risks associated with a specific project. Different project participant groups (Employer, Contractor, and Engineer) have inherently different perceptions of allocation of risks, both between and within the groups. All that can be done is to regulate the risk allocated to different parties and then to properly manage the risk through contract conditions. Since Contractors are unable to influence the contract conditions and clauses, Contractors should understand which risks they should undertake under contract conditions. It can only be achieved by risk management that should be a formal orderly process for systematically identifying, analyzing and responding to risk events throughout the life of a project to obtain the optimum or acceptable degree of risk elimination or control. Therefore, contract administration and risk management concepts are presented in the beginning of this thesis.

In the chapter entitled as "contract administration", organization for the contract administration and contract relationships are mentioned. Then types and components of the contracts are explained. Finally conflicts and claims between Employer and Contractor are discussed. In the chapter entitled as "risk management", risk is defined and the process of the construction risk management system is explored. Then, risk allocation in contracts is mentioned.

Contractors should realize the risk allocation in contract conditions. Thus, the aim of this thesis is to examine how risk factors are shared between different parties in most widely used standard conditions of contract in Turkey, namely FIDIC and General Specification for Public Works and investigate how the risk management strategy of the Contractor change with respect to different contract conditions.

Since the contracts not only ensure timely completion of the project but also provide to mitigate risks, fix liabilities and responsibilities of the Contractors in the construction phase, general information about the FIDIC and GSPW contracts is given to explore the risk allocation in the conditions of these two contract.

Having defined the contract administration, risk management and general outlook of FIDIC and GSPW, interviews are carried out to investigate standard conditions of both contracts from the risk management point of view. For this purpose an interview form has been prepared and interviews have been conducted using this structured form. In the interview, respondents are asked to state the basic differences in the contract conditions when FIDIC compared with GSPW. Moreover, respondents are requested to mention risk allocation principles between the Employer and the Contractor in these two contracts and how conflicts and disputes can be resolved between the owner and contractor under the GSPW and FIDIC conditions. Finally, respondents are asked to state the risk management strategies of the Contractors that is carried out under the conditions of FIDIC and GSPW.

The research findings are organized in main headings, which would best demonstrate the outcomes of the survey. Firstly, role of the Engineer and the differences in obligations of the contracting parties under FIDIC and GSPW contract is identified. Then, risk responsibilities and the contractual rights of the Contractor in accordance with the FIDIC and GSPW contracts are explained. Before discussing suggestions, the most important differences between the

contract provisions of FIDIC and GSPW are illustrated in Table 3.3. Finally the suggestions that are beneficial from the risk management perspective for the Contractors are discussed.

All the respondents state that some important differences between the conditions of FIDIC and GSPW should be taken into consideration from risk management perspective. The followings are some important points to be emphasized about the comparison of the conditions of FIDIC and GSPW contracts:

- Where damage is caused by an Employer's risk there is an obligation upon the Contractor, if requested by the Engineer, to rectify but the costs of such work are to be borne by the Employer in FIDIC conditions. The extension time that is entitled by the Contractor shall be determined by the Engineer. Whereas in GSPW, only necessary time extension shall be given to the Contractor for the delays that may arise owing to such damages and losses.

- The Contractor is not responsible if the works are damaged by an operation of the forces of nature against which he could not reasonably have been expected to take precautions under FIDIC conditions. If the Engineer is of the opinion that adverse physical obstructions or conditions could not reasonably have been foreseen, after consultation with the Employer and Contractor he may determine an extension of time to be allowed to the Contractor and any additional costs to be added to the contract price. Whereas, in GSPW damages and losses caused by the natural disasters at the workplaces are accepted as the insurable risks that can be covered by the insurance (all-risk). Therefore the Contractor can not claim cost compensation but extension of time is allowed for the Contractor for such damages and losses under GSPW conditions.

- If the Contractor is delayed or involved in extra costs as a result of late issue of drawings or instructions, the Engineer shall, after due consultation with the Employer and the Contractor, determine any extension of time to which the Contractor is entitled and the amount of such cost that shall be added to

the contract price under FIDIC conditions. However, in GSPW contract the duration of work shall be extended to meet such delay if this delay makes it compulsory to grant time extension for any part or the whole of the work but there is no cost compensation for the Contractor.

- Under FIDIC conditions, if the rate of the progress of the works is at any time too slow to comply with the time for completion for any reason which does not entitle the Contractor to an extension of time, the Engineer shall notify the Contractor to expedite progress so as to comply with the time for completion. Any additional supervision costs incurred by the Employer due to steps taken by the Contractor to expedite progress pursuant to a notification by the Engineer may be recovered by the Employer from the Contractor. There is no similar clause in GSPW that reveals the circumstances under the rate of the progress of the works.

- In the event of the Employer default, the Contractor can terminate his employment under the contract by giving notice the Employer under FIDIC conditions. In GSPW contract, the Contractor does not have right to terminate the contract in case of default of the Employer.

- Only under FIDIC conditions, Engineer has authority to suspend the progress of the works and the Contractor shall, on the instructions of the Engineer, properly protect and secure the works during such suspension. The Engineer shall determine what extension of time and/or extra costs the Contractor shall be entitled to receive if he is not responsible for the suspension. Suspension clause is not stated under the conditions of GSPW.

It is observed that all of the respondents are aware of the fact that FIDIC is an international specification prepared upon request of the World Bank. Respondents state that it is more advantageous for the Turkish Contractors to use GSPW while performing work in Turkey. Because, FIDIC causes the parties to exhibit correspondences to each other continuously and good relations may be

spoiled from the beginning of work. If main purpose is the performance of work under good relations between parties, FIDIC exhibits difficulties for the parties.

The contractual rights of the Contractor that are specified in payment clauses, default of Employer clause, changes in cost clause and suspension of the works clause in the GSPW are not clear when it is compared to the FIDIC contract. Under FIDIC conditions, rights of Contractor have been clearly pointed out. In GSPW contract, in case the Contractor can not collect his receivables, he does not have any rights. Whereas, in FIDIC provisions, the Contractor has such rights like, terminating the contract, collecting his money back with due legal interests within certain time period or time extension and recovering additional money to compensate for losses due to not being able to collect his money. In GSPW contracts, he does not have any right of termination as well as there is not any condition on when he is to collect his money back. He can obtain only a time extension right whereas, during this course of time, he has to incur costs.

Moreover, disputes generally arise when the Contractor does not state the clause of the contract on which his claim is based on. If the Contractor does not forward his claim within the specified time period, he may lose his contractual rights. Contractor also must explain in detail in his claim how he suffers a loss and the time or money; he is to claim as materially. Otherwise, Contractor's claim would not be considered as valid.

Risks have been defined better in FIDIC conditions. FIDIC examines the relations between the Employer and the Contractor in more detail. All types of bilateral relations have been defined in written form. Therefore, contractors may consider low level of contingency. Additionally, in FIDIC conditions, both sides have to give notice priorily to the other side about all of the works it is going to perform from before a certain period of time. This means that the party that does not give notice to the other in a specified time in the contract loses its right. In this context, FIDIC seems to be more strict. Therefore, systemic planed risk management and risk management planning are required. Risk analysis is

becoming a frontline science in construction projects. More of the risk and hence uncertainty is being placed upon Contractors. Unfavorable ground conditions, strikes, weather conditions, shortages of labour and materials are now regularly allocated in the contract as a Contractor's risk. The Contractor should prepare proper planned risk management to accommodate his risk items which cannot be accurately predetermined in terms of time involvement, and also to provide time for correcting mistakes.

In GSPW, risks have not been defined in detail when compared to FIDIC. Reason of this is that GSPW is a specification already used in tenders applied in Turkey. An expression saying that this work is performed as per the Turkish Republic Constitutional Laws is included at the end of the contract appendix. By this way, even it is not being indicated in GSPW, the Contractor can apply to the Court and file a suit as based on the Constitutional Laws of the Republic of Turkey. As a concluding remark, it should be stated that, whatever contract is used by the Contractor, he should know how the risks are allocated by the parties and determine an appropriate risk management strategy as well as a proper risk premium.

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## APPENDIX A

## SAMPLE OF THE INTERVIEW FORM

### INTERVIEW QUESTIONS

**1.** What are the basic differences in the standard conditions when FIDIC and General Specification for Public Works Contracts are compared?

**2.** In which of the conditions of the contract, FIDIC or GSPW, the risks, that the Employer and the Contractor will confront from beginning of the Works until the end, are better defined and how are these risks are allocated between the Employer and the Contractor? What are the risks that are undertaken by the Employer and the Contractor in accordance with the FIDIC and GSPW contract provisions? Which differences are more important in your opinion from the risk management perspective when FIDIC and GSPW conditions are compared?

**3.** How are disputes between the Employer, Contractor and Engineer resolved according to the FIDIC and GSPW contract conditions?

**4.** When FIDIC and GSPW contract conditions are compared what differences can be observed in the risk management strategy of the Contractor?

- To give an example, what are the differences in the Contractors' risk management strategies during the bidding stage?

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Engineer's Representative | The Engineer's representative shall be appointed by the Engineer. The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he may at any time revoke such delegation.Any communication given by the Engineer's Representative to the Contractor shall have the same effect as though it had been given by the Engineer. G | |
| Instruction in Writing | If the Contractor confirms in writing to the Engineer any oral instruction of the Engineer within 7 days and such confirmation is not contradicted in writing within 7 days by the Engineer, it shall be deemed to be an instruction of the Engineer. | |
| Delays and cost of Delay of Drawings | If failure of the Engineer to issue any drawings within reasonable time is caused to a delay of Contractor, the Engineer shall determine extension time and additional cost that the Contractor is entitled. | If delay occurs in delivery of the projects, the duration of work shall be extended to meet such delay. |
| Adverse Physical Obstructions | If the Engineer is of the opinion that adverse physical obstructions could not reasonable, he may determine an extension of time to be allowed to the Contractor and any additional costs to be added to the contract price | |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Indemnity by Employer | The employer shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of :<br>a) the permanent use or occupation of land by the Employer<br>b) the right of the Employer to execute the works<br>c) damage to property which is the unavoidable result of the execution and completion of the works<br>d)death or injury to people or damage to the property resulting from any act or neglect of the Employer. | |
| Facilities for Other Contractors | The contractor shall, on the written request of the Engineer:<br>a) make available any roads which the Contractor is responsible for<br>b) permit to use of Contractor's equipment<br>c) provide any other service<br>to any other contractors, employed by Employer, the Engineer shall determine an addition to the Contract Price | |
| Costs of Tests | If any test, required by the Engineer, shows the materials, plant or workmanship to be accordance with the provisions of the Contract, Engineer shall determine the costs of making such tests and an extension time to which the Contractor is entitled. | |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Setting out | If any error appears in the position, levels, dimensions or alignment of any part of the works due to incorrect data supplied in writing by Engineer, he shall determine an addition to the Contract Price. | |
| Employer's Risks | a) war, hostilities, invasion, act of foreign enemies<br>b) rebellition, revolution, insurrection, or military or usurped power, civil war<br>c) ionising radiations, nuclear fuel<br>d) pressure waves caused by aircraft traveling at sonic speeds<br>e) riot, commotion, unless restricted to employees of the Contractor and arising from the conduct of the works<br>f) loss or damage due to the use by the Employer<br>g) loss or damage due to design of the works for which the Contractor is not responsible<br>h) any operation of the forces of nature against which an experienced Contractor could not reasonably have been expected to take precautions. | The risks that are impossible to be insured such as the risks arising from wars, domestic mobilizations, rebellions, domestic wards and similar events or radiations arising from a nuclear fuel unless used by the Contractor and subcontractor, shall be accepted the Employer's risks. |
| Insurance | Contractor shall insure<br>a) the works to the full replacement cost<br>b) an additional sum of 15 per cent of such replacement cost<br>c) the Contractor's Equipment brought onto the site by the Contractor. | Contractor shall insurance (all-risk) tools, materials, working and service machinery, vehicles, facilities and completed parts of works carried out at worksites against the risks such as earthquakes, floods, landslides, storms, fires. |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Suspension of Work | The Contractor shall, on the instructions of the Engineer, suspend the progress of the works. Unless such suspension is;<br>a)necessary by reason default of the Contractor<br>b)necessary by reason of climatic conditions on the site<br>d)necessary for the proper execution and safety of the works (except due to arising from default of Engineer or Employer's risks),<br>the Engineer shall determine extension time and additional costs that will be added to the Contract Price. | |
| Suspension lasting more than 84 days | If permission to resume work is not given by the Engineer within 84 days from the date of suspension, the Contractor may give notice to the Engineer requiring permission to proceed the works. If such permission is not granted within said time, the Contractor may elect to treat the suspension. Moreover if it affects the whole of the works, Contractor may terminate his employment by treating the suspension as a default of the Employer. | |
| Failure to Give Possession | If the Contractor suffers delay or incurs costs from failure of the Employer to give possession, the Engineer shall determine extension time to which The Contractor is entitled and amount of such costs which will be added to the Contract Price. | If there is delay in the handover of the worksites to the contractor and this delays the completion of part or whole of the work, the duration of work set forth in the contract shall be extended to meet such delay for part of whole of the work. |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Extension of time Completion | In the event of<br>a) the amount of additional work, or<br>b) exceptionally adverse climatic conditions, or<br>c) any delay, impediment or prevention by the Employer, or<br>d) other special circumstances which the Contractor is not responsible for,<br>the Engineer shall determine the amount of such extension. | The Contract are not attributable to the contractor due to force major reasons or the situations engendered by the Employer, this case shall be reviewed by Employer, and the duration concerning part or whole of the work shall be extended to meet such delay according to the reasons delaying the work and the nature of work that will be carried out. |
| Rate of Progress | If the rate of progress of the works is too slow to comply with the time for completion in the opinion of the Engineer, the Contractor shall take necessary steps to expedite progress of the works. The Contractor shall not be entitled to any additional payment for taking such steps. If the Contractor cause additional supervision costs for the Employer, The engineer shall determine the amount that should be paid by the Contractor | |
| Reduction of Liquidated Damage | If Taking-Over Certificate of any part of the works is issued before Time for completion for that section, the liquated damages for delay in completion of the remainder of the that section shall be reduced in the proportion which the value of the part so certified bears to the value of the whole of the that section. | |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Variations | The engineer shall make any variation of the form, quality or quantity of the works. Engineer has authority to instruct the Contractor to do any of the following;<br>a) increase or decrease the quantity of any work included in the contract<br>b) omit any such work but it should not be carried out Employer<br>c) change the character or quality of any work<br>d) change the levels, lines, positions and dimensions of any part of the work<br>e) execute additional work of any kind necessary for the completion of the works<br>f) change the time schedule of the construction works. | If additional work is not technically and economically possible to separate from the main contract without burdening the Employer, the same contractor can perform additional works up to up to the amount of 10 % of the main contract's price in turn-key lump-sum works contracts and up to the amount of 20 % of the main contract's price in unit price works contracts. |
| Valuations of Variations | If the contract does not contain any rates and prices applicable to the varied work, the rates and prices in the contract shall be used as the basis for valuation. In the event of disagreement between the Engineer and the Contractor, the Engineer shall fix such rates and prices as appropriate in his opinion. | The following analyses are used for the determination of the new unit price according to the order of priority given below:<br>a) Contractor's analyses in his tender documents that is similar to the varied work items.<br>b) available analyses of the Employer that are similar to the varied work items.<br>c) analyses established on the basis of the amount of materials used and the working hours of machinery expended to perform the varied work. |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Payment if the Contract is terminated due to Special Risks | The special risks are the risks defined under paragraphs (a), (b), (c), (d) of the Employer's Risks but the risks defined under paragraph (b) of Employer's Risk should be related to the country in which the works are to be executed.<br><br>If the contract is terminated due to Special Risks, the Contractor shall be paid by the Employer, such amounts of works that are not been covered before the date of termination and in addition:<br><br>a) the cost of materials, plant or goods reasonably ordered for the works which have been delivered to the Contractor,<br><br>b) a sum being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the works,<br><br>c) payment for if Contractor's equipment sustain destruction or damage by reason of any of the Special Risks,<br><br>d) the cost of removal of the Contractor's equipment<br><br>e) the reasonable cost of repatriation of all the Contractor's staff and workmen. | For the contract be terminated due to natural disasters, legal strikes, epidemic cases, announcement of partial or general mobilization and other similar circumstances that may be determined by the Public Procurement Authority when necessary; it should be not resulted from a fault of the contractor, should obstacle the performance of the obligation, should exceed the Contractor's capacity to overcome, and should be documented by Competent Authorities.<br><br>In this case, the accounts of the contract shall be wound up in accordance with general provisions and performance security and any supplementary security shall be returned. |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Arbitration | If a dispute of any kind arises between the Employer and the Contractor, the matter in dispute shall be referred in writing to the Engineer. No later than 84 day after taking the reference, the Engineer shall give notice of his decision.<br><br>If either the Employer or the Contractor is dissatisfied with any decision of the Engineer, either the Employer or the Contractor may give notice to the other party of his intention to commence arbitration.<br><br>Arbitration of such dispute shall not be commenced unless an attempt has first been made between the parties to settle such dispute amicably.<br><br>Arbitration may be commenced 56 days after on which notice of intention to commence of arbitration is given. One or more arbitrators shall be appointed under the rules of Conciliation and Arbitration of the International Chamber of Commerce. | The disputes that may arise between the Engineer and the Contractor shall be settled by the Employer. The contractor shall apply to the Employer with a petition including the claims and complaints as well as the substantial and legal grounds within fifteen days following the date of occurrence of dispute.<br><br>The Employer shall review the issue within two months at the latest following the date of receipt of this petition and submit the resolution on this issue to the Contractor. If any reply is not given to him within this period or if he does not consent to the resolution, the Contractor reserves the right to apply the method set forth in the contract concerning the settlement of disputes. |

| SUBJECT | FIDIC | GSPW |
|---|---|---|
| Default of the Employer | In the event of the employer:<br>a) failing to pay to the Contractor the amount under any certificate within specified time, or<br>b) interfering with or obstructing or refusing any required approval to the issue of any such certificate<br>c) becoming bankrupt,<br>d) it is impossible for him to continue to meet his contractual obligations due to economic discolation,<br>the Contractor shall be entitled to terminate his employment under the contract. | |
| Contractor's Entitlement to Suspend Work | The Contractor may suspend work or reduce the rate of work if the Employer fails to pay the amount under any interim certificate within 28 days after such interim certificate has been delivered to the Employer.<br>If the contactor suspends the work or reduces the rate of the work in accordance with the contract provisions, the Engineer shall determine extension of time to which the Contractor is entitled and the amount of such costs that shall be added to the Contract Price. | |