INTRODUCTION TO CONSTRUCTION DISPUTE RESOLUTION

FENIOSKY PEÑA-MORA, SCD., ASSOCIATE PROFESSOR, MIT
CARLOS E. SOSA, MSC., MIT
D. SEAN MCCONE, MSC., MIT

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PREFACE

Leading construction experts have identified Productivity, Innovation, Cost Control, Safety, and Litigation Expenses as critical areas in need of improvement in the construction industry of this next century. In the United States alone, $60 billion are spent every year on lawsuits, of which the construction industry accounts for nearly $5 billion. The fact that these construction litigation expenditures have increased at an average rate of 10% per year for the past ten years is one of the primary motivations for this book. This reality has generated the need to develop new Dispute Avoidance and Resolution Techniques (DART) with the aim of curving this cost spiral and improving productivity. Fueled by this need, and as projects throughout the world continually achieve higher levels of complexity, the field of construction dispute resolution has exploded with innovative ways to prevent conflict and resolve disagreements. Companies have found that in highly competitive markets, the resolution of disputes has become a key to forging stronger and longer-lasting relationships with their clients. As a result, the construction industry has been in the forefront of the development of DART. This book presents and reviews a significant number of new and innovative ways to promote collaborative environments and resolve disputes in construction. This includes some practical applications of DART in the construction industry throughout a number of nations. The aim is to provide the reader with data to support the successes or failures of these techniques in multiple cultures.

In effort to ground the material in this book, some examples are presented of how the material relates to current construction projects. These examples will be referred to as cases. Not all the information specific to the project has been presented, as they are only included to correlate theory with practice. They are also not included to illustrate either effective or ineffective handling of dispute avoidance and resolution procedures. In addition, some names or facts may have been changed for confidentiality reasons. Each of the relevant chapters will open up with an introduction of facts to the case and leave the reader with some questions to ponder while reading the chapter. At the end of each chapter the case is revisited relating the chapter information to the project situation.

Content

This introductory book is divided in 12 chapters. The first chapter describes the construction industry, focusing on its size, structure, relationships and sources of conflicts. Chapter 2 presents a background for the evolution of construction DART. It also presents a brief review of the reasons behind the apparent large number of disputes in the construction industry, and identifies characteristics that make the construction process adversarial in nature. The final section of Chapter 2 looks at two different proposals for the organization of DART in the construction industry. It selects the concept of the “Dispute Resolution Ladder” (DRL) to organize and present different techniques found being used around the world.

Chapters 3 through 9 present the state of the art review of DART in the construction industry following each of the stages of the DRL defined in Chapter 2. Chapter 3 reviews techniques in the Prevention Stage with examples of mechanisms that can mitigate and discourage disputes during the construction process. This chapter highlights the role the owner plays in the introduction of dispute avoidance and resolution clauses in construction contracts and as a promoter of honest communications between the parties to the project. Chapter 4 reviews the concept of Partnering. Although not a Stage in the

Dispute Resolution Ladder (DRL), Partnering was developed to change the adversarial approach to the construction process, with the aim to improve job performance and reduce conflict and confrontation. This concept integrates dispute resolution with other communication and collaboration techniques that have resulted in a significant reduction in the number of conflicts in those projects in which it is fully implemented. This chapter introduces the essential phases of the system, and its key components.

Chapter 5 examines the Negotiation Stage in the process of dispute resolution in construction. This chapter offers three different approaches to improve the outcomes of negotiations: Step Negotiations, Structured Negotiations, and Facilitated Negotiations. The introduction of neutral third parties begins in Chapter 6, with the Standing Neutral Stage; a concept based on the incorporation of an unbiased, knowledgeable party as an instrument to resolve disputes efficiently and effectively as soon as they develop. Chapter 7 examines the Non-Binding Phase of the DRL, covering Mediation, Advisory Opinion, Fact-based Mediation, Minitrial, Summary Jury Trial, and Voluntary Settlement Conference as the available DART techniques. A significant acceptance of non-binding dispute resolution mechanisms is reflected in the number of variations that have developed, as these procedures represent the last stage of the DRL in which the parties have control over the outcome of the dispute.

Chapter 8 examines approaches where a third party issues a final award to settle the dispute. These approaches correspond to the Binding Dispute Resolution Stage in the DRL. Arbitration, the most common form of binding resolution procedure, is reviewed, together with three other developments that can prove advantageous to a project that might be inclined to minimize arbitration. Finally, as part of this review of DART in construction, Chapter 9 looks at Alternative Litigation and Litigation as the last Stage in the DRL. This Stage corresponds to a dispute resolution procedure of “last-resort,” and is examined together with three techniques that can help reduce the amount of resources spent on court proceedings (i.e., time and money).

Chapter 10 presents the concept of a Conflict Management Plan for projects. In all arenas of construction, conflict is evident, but being able to quantify the degree of conflict is challenging. Taking into consideration, the causes and results of the most common conflict situations, a conflict management plan can be designed from the DART presented in the previous chapters. The probability of conflict occurring is assessed along with the impact that each conflict may have on the project. A preventative strategy is developed to reduce the probability of conflict occurring and a resolution strategy is planned to minimize the impact of conflict if it does occur. The resulting Conflict Management Plan will help owners and contractors to evaluate the interactions among participants and actively involve everyone in the dispute resolution process.

Following the presentation of all the material in the book, Chapter 11 analyzes a light rail transit project in San Juan, Puerto Rico. This case study is included to promote discussion on the methods to avoid claims and resolve disputes used in the project. This project made use of preventative measures such as Partnering as well as a predefined dispute resolution system. Analyzing this project allows the reader to envision how new and innovative techniques can be implemented into the industry.

Finally, Chapter 12 gathers the conclusions of the book. First, it summarizes the DART techniques. Second, it highlights the importance of alternative dispute resolution in construction worldwide and how cultural conditions have affected the selection of the DART, based on the examples presented throughout the book. Finally, this chapter suggests areas for further study in the field of construction conflict, dispute avoidance, and alternative resolution methodologies.

Intended Audience

This introductory textbook is offered to both graduate and upper level undergraduate students, as well as practicing professionals such as construction managers, design engineers, and owners. Students should use this book to develop a basis of knowledge in the area of dispute avoidance and resolution in the construction industry. We hope that they will use this knowledge when they become practicing professionals or spark further research in this area if they continue their graduate studies. Current practicing professionals should compare this book with their current knowledge, keeping an open mind in new techniques and whether they apply to their situation. This book is offered to the professional community as the construction industry responds to its global reach, where the conflicts are multinational. This book in no way serves as a substitute for individual legal council provided by an attorney. Our competency in addressing these issues stems from an international construction engineering and management background with limited legal training in any specific country. Therefore, take no specific legal advice from us, as none is offered. Your legal council, familiar with your individual project situation, should advise you of your options.

About the Authors

Feniosky Peña-Mora (ScD., MIT) is an Associate Professor of Information Technology and Project management in the Civil and Environmental Engineering Department's Intelligent Engineering Systems Group at the Massachusetts Institute of Technology. Prof. Peña-Mora current research interests are in information technology support for collaboration, change management, conflict resolution, and process integration during design and development of large-scale engineering systems. He is the leader of the Da Vinci Agent Society Initiative at MIT that integrates his research interests. He is the author of publications on computer-supported conflict resolution, computer-supported engineering design and construction, project control and management of large-scale engineering systems. One of his publications received the 1995 award for best paper published in the ASCE Journal of Computing in Civil Engineering. He is also holder of a 1999 NSF CAREER Award and a 2000 White House PECASE (Presidential Early Career Award for Scientists and Engineers) Award. He has been an invited speaker in numerous conferences and symposiums including the 2001 National Academy of Engineering Frontiers of Engineering Symposium. Prof. Peña-Mora has been a consultant for industry and governments in Argentina, Colombia, Dominican Republic, Japan, Puerto Rico, and the United States. He is the Chief Technology Officer for Peña Alcántara Consultants, a consulting firm specializing in project management and information technology. He was the Chief Technology Officer for inMeeting.com, an Internet company specializing on managing rich collaborative sessions in heterogeneous devices for large-scale product devlopment. In the Boston Central Artery/Third Harbor Tunnel Project, he was the Chief Information Technology Consultant for the Project Director. There, he focused on information technology support for change management and process integration during the design and construction stages of this $13.6 Billion, decade long regional engineering endeavor.

Carlos E. Sosa (MSc.., MIT) is a practicing professional in the field of Claim Management and Dispute Resolution in Venezuela. After working with some of the major contractors in Venezuela, in 1997 he began its own consulting firm dedicated to offering Construction Management and Dispute Avoidance and Resolution Services to contractors and developers. In 1999, he led the development and successful launch of Venezuela's first and most important Internet Construction Portal www.areazul.com, together with the Venezuelan Construction Chamber. Currently he is working on expanding the services offered by his firm throughout Latin America.

D. Sean McCone (MSc.., MIT) is a practicing professional in the construction management and engineering profession. He completed his undergraduate studies at the University of Illinois at Urbana-Champaign while working for Johnson, Mirmiran and Thompson, a transportation-engineering firm in Baltimore, Maryland as a work/study student. As an assistant program manager, he was involved in the management for the design of over US$1 billion in capital improvements at the Baltimore Washington International airport.

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Feedback

Comments, constructive criticisms, and suggestions are welcome and encouraged. Suggestions and contributions to make this book more relevant and useful to the intended audience are greatly appreciated. Please contact Feniosky Pena-Mora at *feniosky@mit.edu*.

DEDICATION

Feniosky Pena-Mora:

A los pilares de mi vida:

- **Mami,** *Mirtha Mora-Cepeda,* por sembrar en mí una visión positiva cada vez que tenía que conseguir algo muy importante. Siempre me decías: "Lo único que puede ser es que tu ganes. Si tratas y no lo obtienes, te quedas igual – tu no lo tenias como quiera. Si tratas y lo obtienes, ganas. Por tanto solo puedes ganar."
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- **My Father,** *Ramón Peña-Salcedo,* for always reminding me that my only job was to study.
- **My Beloved Wife,** *Minosca Alcántara- Damirón (Minin),* for loving me so much and providing me support in everything I do.
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I have to acknowledge and appreciate the support and patience of my wife Cristina. Throughout this race against time, Cristina has been both an inspiration and a challenging voice that has kept me going, even at times when I felt the objective was unattainable. I would also wish to thank my sister Daniela Sosa and my father Carlos Sosa. I wish to dedicate this effort to my family, including those who will hopefully be joining us in the near future.

D. Sean McCone:

This book is dedicated to all of my family for their love and caring. In particular, I would like to express my sincere gratitude to my parents, Fran and Bob. Throughout my years, you have given me the freedom and support that defines who I am. I hope that one day I will be able to repay you for the priceless contribution you have bestowed upon me. Carrie and Brett, thanks for all the encouragement. Kelly, thank you for your love and support, and for enduring the frustration and stress I exuded on you during my extensive studies.

CHAPTER 1

THE CONSTRUCTION INDUSTRY

In the United States alone, $60 billion are spent every year on lawsuits, of which the construction industry accounts for nearly $5 billion.

Paraphrasing Henry Michel (1998)

In 1995, companies from six different countries participate at different levels, with different contractual relationships to build a Refinery. For the construction of this Refinery in an Island in the Caribbean Sea (Figure 1), a British energy conglomerate (*CLIENT*) hired an engineering and construction firm from the United States to serve as the construction manager (*CM*). Among the many contracts for the Refinery, a Liquid Nitrogen Gas facility had to be designed and built, for which the *CM* chose a design firm from England (*DESIGNER*), and awarded it a two-year fast-track Design-Build package. This design firm, a subsidiary of a German design and construction company, kept the design in-house and divided the construction package in the usual work subdivisions (i.e., site work, foundations, civil, mechanical, electrical, and specialties). The *DESIGNER* negotiated and awarded the contract for the foundations to an Italian contractor with experience in similar projects, and the civil works contract[1] to a medium size company

CHAPTER LOOK AHEAD

WHAT IT IT? The construction industry is unlike any other industry in the world. The global market encompasses over three trillion US dollars. The vast majority of construction projects are one-time individualistic projects, never to be duplicated, developed in an open environment where variables such as weather, soil, political, social and environmental conditions are difficult or impossible to control.

WHO IS INVOLVED? Participants in this industry include owners, engineers, governments, regulation agencies, constructors, unions, suppliers, lawyers and financial institutions to name a few. Their roles and objective in the construction industry vary based on their contractual relationships for each project.

WHY IS IT IMPORTANT? Conflict in this industry is inherent of the characteristics of this industry. Industry size, complexity, uniqueness are conflict related characteristics. If we understand the characteristics of the industry causing conflict, we are more apt to develop DART.

HOW TO APPROACH IT? Understand the organizational issues and project uncertainty that create conflict. Evaluate the roles each participant plays in a construction project. Review the delivery systems that are currently used today to define these relationships. Evaluate the contractual relationships that each participant holds. Apply this knowledge to the projects, to help reduce potential conflict.

KEY CONCEPTS

from Venezuela. The Italians had recommended the Venezuelan company due to positive past experiences in other large-scale projects. The total scheduled duration for these two contracts was 18 months: ten months for the foundations and twelve for the civil works, with a four-month overlap.

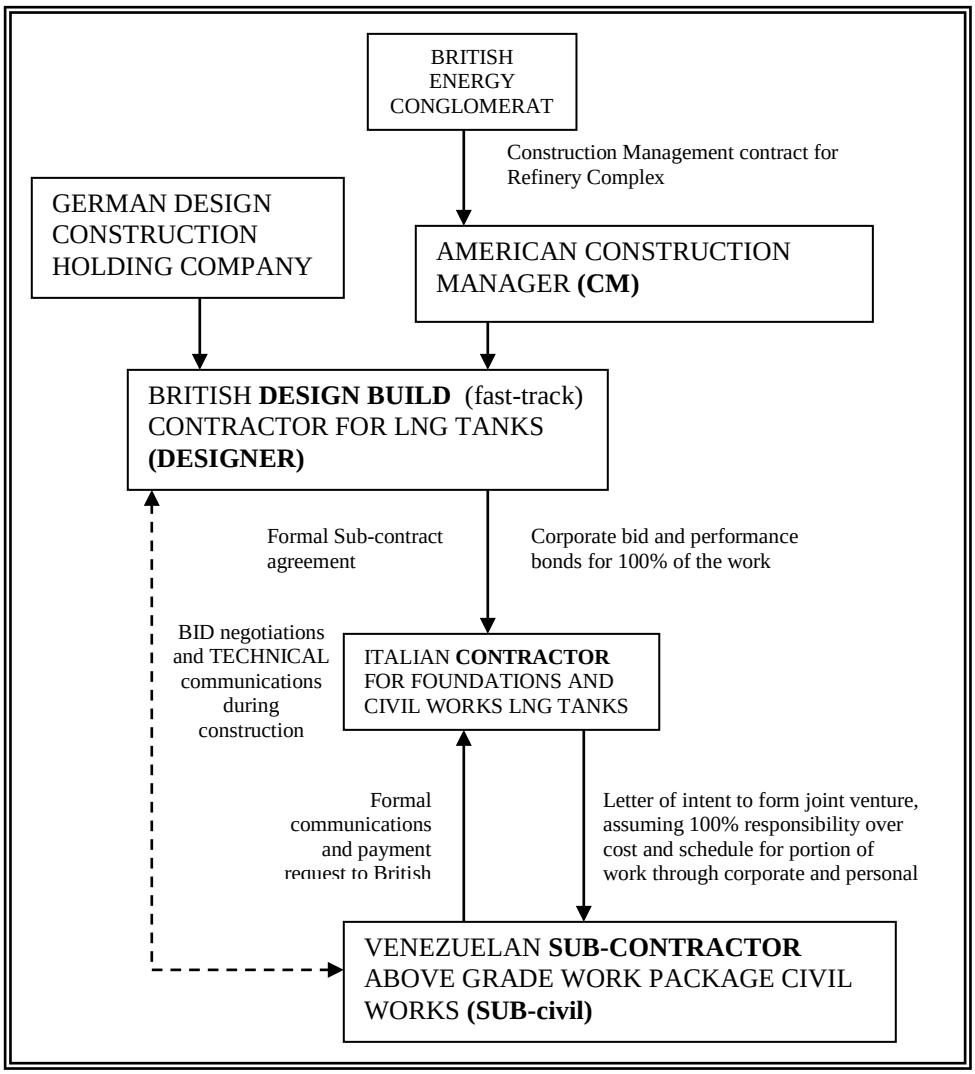

Figure 1- Diagram of Parties and Relationships for the LNGT Project.

Looking a little closer at the structure, because of sub-contractor approval and bonding requirements imposed by the *CM*, the British *DESIGNER*, and the Italian and Venezuelan contractors agreed to have the foundations and civil works packages lumped as one contract to be awarded to the Italians (*GC*). The latter in turn would subcontract out the civil portion to the Venezuelan contractor (*SUB*). The contracts were drawn up following this arrangement; nevertheless, communications lines were established as if the Venezuelan *SUB* was working directly for the British *DESIGNER*.

Looking at the structure of this project, some important questions arise. Does this arrangement provide any indication on how much conflict the project would encounter? Is there anything about the project structure that would give an indication on how this

project will handle conflicts? Does this project have mechanisms to handle uncertainty in this project? Is there a process by which conflicts on this project will be handled?

1.1 SOURCES OF CONFLICT AND DISPUTE

A number of causes of disputes in construction projects have been presented in literature. However, a common source of conflict found is the fact that the majority of projects are a one-time experience. Even when companies perform projects of a similar nature and for the same client, differing site conditions, regulations, subcontractors, market conditions, and team members modify the development of the contract.

Construction is significantly different from manufacturing, where the same goods are produced a thousand times. Construction does not allow for the change of one variable while holding the rest fixed in order to study its effects. Furthermore, in any given project, different reasons for a particular dispute will be found depending on who is asked, at what stage of the project the research is conducted, how the survey is administered, or what documentation is available for review. That is why analyzing construction projects *post-factum* adds complexity and makes the concluding task more difficult.

The rationale behind the efforts to identify the sources of disputes in construction has been the premise that if the origins of the "illness" can be identified, ways to "cure" the industry from unnecessary litigation can be developed. In particular, Stipanowich (1996) described the construction industry as the *"…spearhead of experimentation with mechanisms aimed at avoiding disputes by addressing the roots of controversy."* Table 1 summarizes seven different research efforts conducted during the past decade, and the sources of disputes in construction projects they have identified.

Table 1 – Research on the Sources of Conflicts and Disputes in the Construction Industry (Fenn et al., 1997)

Research Author	Sources of Conflicts and Disputes in Construction
Bristow, 1998	Six Areas: unrealistic expectations; contract documents; communications; lack of team spirit; and changes.
Conlin *et al.*, 1996	Six Areas: payment; performance; delay; negligence; quality; and administration.
Heath *et al.*, 1994	Seven Areas: contract terms; payment; variations; time; nomination; renomination; and information.
Hewit, 1991	Six Areas: change of scope; change conditions; delay; disruption; acceleration; and termination.
Rhys Jones, 1994	Ten Areas: management; culture; communications; design; economics; tendering pressures; law; unrealistic expectations; contracts; and workmanship.
Semple *et al.*, 1996	Four Areas: acceleration; access; weather; and changes.
Sykes, 1996	Two Areas: misunderstandings; and unpredictability.

At first sight, it seems that there are vast sources of construction conflicts and disputes, but if you take a closer look you will see that most of the areas are the same, but identified with different adjectives. This problem requires a set of labels or headings to facilitate the comprehension of the reasons behind construction conflicts and disputes. On this account, Howell *et al.* (1988 cited by Vorster, 1993) proposed a nomenclature of elements that summarize four causes behind conflict in the construction environment:

- Incomplete scope definition
- Inappropriate contract type
- Poor communication
- Uncertainty

However, this classification can be further simplified in this book into to two main areas. This arrangement gathers most of the information presented in Table 1 and Howell *et al.*'s model, yet it permits a simpler cataloging of the 'genesis' of construction disputes. This classification is presented herein to accurately group these areas of conflict.

Table 2 – Sources of Conflict and Dispute

Area	Discipline	Sources of Dispute
Organizational Issues	Structure	Internal/external organizational structure, delivery systems, inappropriate contract type, contract documents, contract terms, law
	Process	Performance, quality, tendering pressures, payment, delays, disruption, acceleration, administration, formal communication channels, information sharing, reports and poor communication
	People	Misunderstandings, unrealistic expectations, culture, language, communications, incompatible objectives, management, negligence, work habits, and lack of team spirit
Uncertainty	External	Change, variations, environmental concerns, social impacts, economics, political risks, weather, regulations , and unforeseen site conditions
	Internal	Incomplete scope definition, errors in design, construction methods and workmanship

This characterization has the additional contribution of supporting the notion that people issues are related to the project structure and process problems. For example, certain project structures align some of the participant's objectives where as others do not. When the parties' objectives and interests are not compatible, their interpretations of contract documents, terms and conditions can be divergent leading to discrepancies and conflicts. In short, all of disciplines within an area are interrelated.

Confirming this notion of a relationship between objectives and disagreements, many participants acknowledge the apparent conflict-prone nature of construction projects on the incompatibility of the parties' initial intents. Each construction party starts with a different set of goals, correlating this information to the high tendency to conflict in this

industry. Incompatible objectives are responsible for the frequent disagreements on how to approach and complete a project, leading to adversarial attitudes. Table 3 illustrates the results, when they asked owners and contractors to identify what constituted business success for their companies in construction projects following a traditional Design-Bid-Build approach.

Table 3 – Owner-Contractor Objective Alignment (Howard et al., 1997)

CONTRACTORS OBJECTIVES
• Achieve profit and other financial gains. • Satisfy client and generate repeat business. • Manage cash flow. • Limit long-term liability. • Develop employees and create satisfaction. • Optimize employment level within contractor organization.
CONTRACTORS' AND OWNERS' OBJECTIVES
• Complete the project within budget. • Complete the project within schedule. • Maintain a high level of quality. • Execute the project safely, without wasted time or accidents. • Minimize claims and litigation.
OWNERS OBJECTIVES
• Meet return on investment goal. • Minimize plant operating and maintenance costs. • Minimize plant downtime and outages. • Achieve high product quality. • Achieve product throughput capacity goals. • Provide design flexibility to meet future demands. • Minimize disruptions to existing operations. • Avoid negative impact on environment and community. • Reduce project cycle time. • Exceed internal customer's expectations.

As shown, only in a few responses the owner and contractor shared a set of objectives. On the one hand, *"the owner wishes to obtain maximum quality, functionality, and capacity at a minimum cost."* On the other, *"the contractor ...must achieve financial goals that are advanced by expending the minimum resources required to meet a minimum scope of work"* (Howard *et al.*, 1997). This limited alignment of objectives fosters the development of conflicts and disputes.

After reviewing the reasons behind disputes in the construction, it appears that conflict is an intrinsic aspect of this industry, as each project has its own set of organizational issues and project uncertainty. These conditions also make each project unique, making the development of a unique theory on the sources of conflict and dispute in construction a challenging task. Therefore, it remains the responsibility of each project team to assess their specific project characteristics to develop a joint, creative, and effective approach to deal with and resolve conflicts before they can lead to disputes.

1.2 ORGANIZATIONAL ISSUES

As seen in the LNGT project, organizational structures can be very complex. Contractual relationships and channels of communication created may be inefficient and create conflict. The structure of a project can reduce or create conflict among the multiple participants. To get a grasp on project structure lets first look at several different "pure" project structures and delivery systems in order to identify participants, their roles, their responsibilities, and their relationships. Next, we can identify potential conflicts in those relationships, to evaluate how the delivery system affects the conflict situation, and therefore, the negotiation process through changes in participants' relationships.

1.2.1 PARTICIPANTS AND PEOPLE ISSUES

General characteristics of the major participants on the project, such as the owner, the A/E, the contractor, and the CM, are reviewed here based on their interests, positions and attitudes. Others that need to be considered but not mentioned here include subcontractors, suppliers, unions, lawyers and financial institutions. Between these participants, there are many sources of disputes. Misunderstandings often result in conflict. All owners push for a job to be completed, as soon as possible, with exceptional quality and minimal cost, but sometimes their expectations are too high. Even though a contractor may be performing exceptionally compared to the industry standards, the owner's paranoia may harbor the feeling that contractor is not. As seen, people issues are a major source of conflict. However, projects that encounter monumental challenges and enormous conflicts can be overcome if the participants cooperate and communicate effectively.

Owner

The owner is the inciting party for whom the project is developed. This party is also, in most cases, the source of the financial resources that support the project. It is important to notice the distinction between private and public owners, because the private owner's contracts operate differently from the public ones. The private owner may include individuals, partnerships, corporations, or various combinations thereof. Most private owners are the end users who have the facility built for their own use. Some others may sell, lease or rent the facility to others for a profit. These differences of the owner's position in the "value system" (Porter 1985) may affect his/her strategy and, therefore, his/her interests in a project. On the other hand, in the United States the public sector owners are composed of local, state, or federal governmental bodies. Public projects are paid for by appropriations, bonds, tax levies, or other forms of financing and are built to meet some defined public need. It is interesting that public owners' interests are largely affected by the needs of the public they serve, who is usually not at the table when conflicts occur. Another important point is that the public owner may be subject to restrictions on delivery methods, such as a state law against public owners using design-build. This may sometimes result in contractual relationships that contain unresolved problems, or potential conflicts.

Architect/Engineer (A/E)

The A/E is the party that designs the work and often administers the construction phase of the project on the behalf of the owner and in the absence of a CM. The A/E can occupy a variety of positions with respect to the owner for whom the design is done. It is quite common that the A/E acts as an independent designer under contract with the owner. In some agencies that hold their own in-house designers, the A/E occupies a functional part

of the owner's organization. Meanwhile, the A/E may be affiliated with the contractor when the owner contracts with a single party for both design and construction services. Depending upon contracts and organizations, the A/E takes various positions as they relate to both the owner and the contractor. In those cases, the A/E's interests may differ accordingly from project to project, however, some of his/her inherent interests, such as safety and aesthetics, will not change.

General Contractor (GC)

The GC is the entity that is charged with the responsibility of actually putting construction work in place and performs some or all of the actual work. The GC is the entity that determines the means, methods, techniques, sequence, and procedures to direct the actual construction activities. The subcontractors are responsible to the GC in the same way that the GC is responsible to the owner. Therefore, in the interest of clarity and simplicity here, the discussions on construction forces are confined to the GC. In different contracts, there are a number of ways to price and pay for contracted services of the contractors, which greatly influence one of their greatest interests, profit and risk allocation. It must be noted that recent trends have been for a GC to subcontract all the work for a project and not perform any of the actual work. For the purpose of this book we define these general contractors as construction managers at risk.

Construction Manager (CM)

The CM may be design firms, contractors, or professional construction managers. Construction management services range from mere coordination of contractors during construction, to broad responsibilities over project planning and design, construction scheduling, cost monitoring, and other management services. Depending upon the scope of work determined by contracts, the CM may have several interests at a time, but most of the times, some interests such as reputation remain at the center of the CM's interest, considering the nature of the professional services it provides.

Roles, Responsibilities, and Relationships

Based upon the characteristics of the major participants in a construction project, their roles, responsibilities, and relationships need to be examined. To examine their relationships however, it must be noted that there exists contractual relationships and communicational relationships among the participants in projects. It is important to maintain the clear distinction between these two types of relationships when we scrutinize the project structures. There may not be a contractual link between the major participants in a project, but only a communication link. This means that, although two parties may sit at opposite ends of the negotiation table, a particular outcome may have to be expressed through contracts held by a third party. The traditional design-bid-build system, for example, places the owner in the middle of any conflict between the designer and the contractor, who only have communicational relationship in the project. Thus, it is critical to understand the contractual relationships and communicational relationships in order to explore the negotiations that will occur as part of the administration of the contract on a particular delivery system. The relationships need to be examined within a delivery system for them to be accurately characterized.

1.2.2 PROJECT STRUCTURE

There may be a number of ways to classify project delivery systems. The following seven delivery systems were selected for review so that they can effectively show clear distinctions between the participants' roles, responsibilities, and relationships.

- The Traditional Design-Bid-Build (DBB)
- Pure or Agency Construction Management (PCM)
- Construction Management at Risk (CMR)
- Design-Build (D/B)
- Turn-Key (TKY)
- Design-Build-Operate (DBO)
- Build-Operate-Transfer (BOT)

DBB has been the most frequently used delivery method, often called the "traditional" approach. This assumes that design and construction of the project proceed in sequence, awarding the construction contract after plans and specifications are completed. Most references in this book are targeted toward the DBB delivery system unless noted otherwise. In construction management, a construction manager plays a distinctive role to perform as the owner's agent or sometimes to take construction risks instead of the owner. These two types of construction management, PCM and CMR, are expected to illustrate the effect of risk shift among participants' relationships. Recently some "new" delivery systems packages such as D/B, TKY, DBO, and BOT have become popular. These delivery systems focus on the concept of combining project phases into on one contractual service. Figure 2 is included to define what we mean by "project phases".

	Project Phase		
Scope of Work	Design	Construction	Operation & Maintenance
Financing	Short-Term Financing		Long-Term Financing

Figure 2 - Contractual Services (Gordon 1991)

D/B is a delivery system where both design and construction functions are combined under one contract. TKY can be categorized as one of the modification of D/B, which packages design, construction, and short-term financing. DBO is an extension of the TKY delivery process, but with O&M included over an extended period of time. BOT is a further extension of the DBO model, including long-term financing. Those differences in scope of the contracts are also anticipated to make distinction among each participant's relationship. The models of the project structure followed in these four delivery systems are depicted in Figure 3. Project structures for TKY, DBO and BOT may be illustrated similarly as the one for D/B, except for the differences of extra functional groups involved in their teams, such as O&M forces and financing firms.

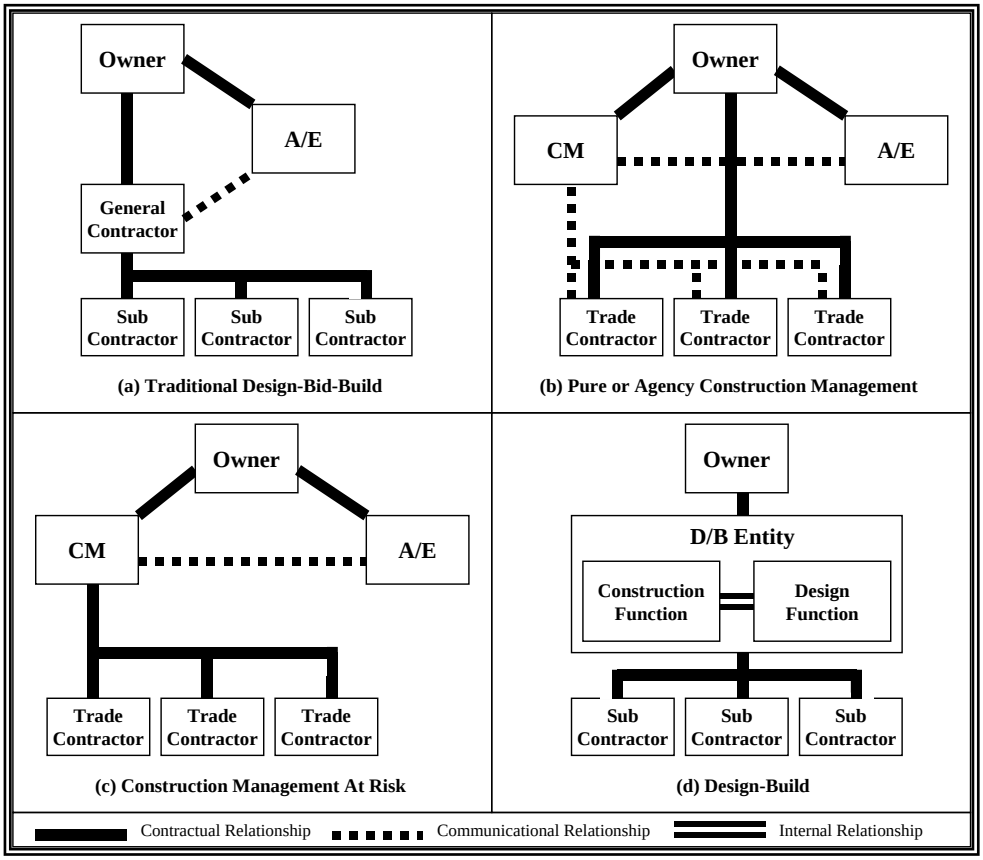

Figure 3 - Project Structures of Selected Delivery Systems

The Traditional Design-Bid-Build

The owner, the A/E, and the contractor are the three major participants in this structure. The project proceeds sequentially, with design reaching full completion prior to conducting bidding and the selection of a contractor.

In this structure, the owner contracts directly and separately with the contractor and the designer. There are formal contractual relationships between the owner and the contractor as well as between the owner and the designer. The owner selects and hires the A/E to whom they may entrust responsibility for design and construction inspection. A lump sum bid is commonly used in this delivery system for both public and private projects. The lump sum and general contractor approach tends to set up a build-in adversarial relationship between the owner and contractor. This typically results from the general contractor's principal interest in delivering the project below the lump sum amount to achieve or increase profit or to encourage change orders or claims for the same reason. The owner's interest may vary depending upon projects, including quality and value of product, delivery schedule, site safety, and environmental impact. However, they are greatly influenced by the major assumption for this system that responsibility and risk are allocated easily by segmenting tasks. The owner also has an emphasis on construction costs that the DBB method pursues through a strong market competition.

The A/E completes the design and develops the general contract documents, interpreting the owner's needs. The general responsibilities beyond those are to administer the owner-contractor contract, functioning as the owner's agent. The owner and A/E are in more of a collaborative position, because the A/E is typically selected on a qualification basis, and

occupies the position of primary consultant and fiduciary to the owner. No formal contract exists between the A/E and the contractor. However, despite no contractual relationship, the informal relationship of communication exists between the A/E and the contractor. The adversarial relationship may occur between them, because the contractor has to act on orders from a contractually unauthorized source. From the nature of work and selection base, the A/E's interests may include profit, aesthetics, relationships, quality, recognition, and otherwise.

The general contractor's role usually starts from the bidding stage, so they play very little or no part in the design phase. They take total charge of the site and construction of the project. They coordinate and supervise the works of the subcontractors who actually undertake most of the construction. They are responsible to the owner for the construction in accordance with plans and desires of the A/E. They normally assume responsibility for all site safety issues. In general, the contractor's interests may include profit, construction time, relationships, and reputation, although profit almost always seems to be one of the top priorities. Construction time, or schedule, is also a key element of the project especially in a situation that time becomes a cost item to the contractor.

Pure or Agency Construction Management (PCM)

The owner is responsible for selecting and hiring the PCM as well as the A/E. The owner's interests may not be different from the ones in DBB, but the choice of a PCM as an agent largely affects the owner's interests. The owner appropriately selects the PCM system, due to its advantages of great flexibility in the schedule and for changes, as well as fiduciary relationship with the contractor both before and during construction, while still providing market competition for most of the work (Gordon 1991). The role of A/E remains much the same as in the traditional design-bid-build method, but the appearance of a PCM affects the A/E's roles. The A/E is forced to adjust their communication network and their own responsiveness to accommodate the owner-PCM relationship. The PCM does not hold any contracts with trade contractors, nor guarantees any sort of upset price to the owner. For these reasons, the financial risk to the PCM is small but the risk of loss of reputation is very high. Unlike other participants, the PCM in this system may have greater interest on reputation and relationship at the expense of profit since most of the time they have fixed fees. In this light, it is likely that the PCM could undertake the facilitator/mediator role in negotiations when conflicts arise in a project.

Construction Management at Risk

This is often called construction management with a guaranteed maximum price (GMP). Many owners want to reduce their risk by having the CM guarantee a total upset price for the work, a GMP. With a GMP, the process becomes more like the traditional design-bid-build process. This casts relationships into a status somewhere between that of the traditional design-bid-build method and the pure construction management method. In this system, the CM holds all of the trade contracts directly. The CM is responsible for completing the project for a total sum equal to or less than the GMP. Their interest on profit becomes more intensive as project costs approach the ceiling of GMP. This tends to change the CM's attitudes in negotiations during the course of the project.

Design-Build

The owner contracts singularly with the D/B team. The design function and construction function are within one contractual team. The responsibility for design and construction rests with one organization, and there exists only one contract to the owner. This is usually a type of general contractor firm with design function. The design function can be another firm, and the relationship is just as another subcontractor to the prime. Contrary

to DBB, the owners may have more emphasis on schedules despite less control and more uncertainty of cost. One of the disadvantages of the system is the loss of control over design and flexibility in changes. The owner must be knowledgeable enough about design and construction to establish the initial parameters, review proposals, and monitor the process, which frequently require the help of an independent consultant.

Analyzing Delivery Methods

Given the roles, responsibilities, and relationships of major participants, Table 4 illustrates the differences of the relationships among the major participants in the four delivery systems. Depending upon the delivery systems, participants form different relationships: the contractual, communicational, or internal relationships.

Table 4 - Relationships among Participants

	Owner-A/E	*Owner-Contr.*	*A/E-Contr.*	*Owner-CM*	*CM-A/E*	*CM-Contr.*
DBB	**K**	**K**	**C**	-	-	-
PCM	**K**	**K**	-	**K**	**C**	**C**
CMR	**K**	-	-	**K**	**C**	**K**
D/B	**K***		**I**	-	-	-
K: Contractual Relationship; **C**: Communicational Relationship; **I**: Internal Relationship; *: Contractual Relationship between the Owner and the D/B Team						

Relationships differ even between the same participants of projects. For example, CM-Trade Contractor relationship changes from the communicational one to the contractual one when the owner shifts his/her risks to CM. The roles and positions may differ significantly, even under the same relationships participants have. For example, one of the A/E's main interests in the DBB contract is to protect his own and the owner's interests, while, in the D/B contract, he/she plays the opposite role as the co-worker of the contractor with the intent of bringing value to the D/B team instead of the owner. The relationships between the CM and the A/E also show the differences between two construction management systems. In PCM, both the CM and the A/E serves the owners as agents and work together in a collaborative manner, while the CMR in practice appears to be a GC and they may have adversarial relationships.

Since the roles and positions that every participant takes are regulated by the contract they agreed on prior to the beginning of the project, different contract types lead to varied positions and interests. Thus, the relationships and interests of participants become extremely complex. It is quite possible that an owner has a fiduciary relationship with a designer in a DBB project, while they have an adversarial relationship with the very same designer in a different D/B project. Moreover, one participant may take two or more distinct roles in a single project that adopts "innovative" hybrid delivery system. An example of this is the Systems and Test Track Turnkey contract in the Tren Urbano Project in Puerto Rico (Section 11.2), which includes design and construction of a facility, operation system supply, O&M, and coordination/management of other D/B facility contracts. In such a situation, conflicts due to interest inconsistency occur while they have to collaborate on the same project under the relationships defined by their contract protected by law.

Thus, information on relationships may help the project participants avoid their role and responsibility confusions. This is especially important in a large-scale project, because some participants may hold several different contracts and their roles and responsibilities differ among those contracts. Surveys in American industry show that there is only a 35% overlap between that which top managers expect their close subordinates to do, and that which the subordinates themselves think they should do (Scott *et al*., 1990). This may apply directly to owners and their relationships with contractors or contractors and their relationships with subcontractors. Role confusion or misunderstanding is almost inevitable, especially under competitive stresses in the context of a large-scale project. Information on roles and relationships may also help in contract planning and formation process, especially when a hybrid type of delivery system is under consideration. The owners or project managers should check the interest inconsistency in allocating multiple responsibilities and risks for hybrid systems.

1.2.3 PROCESS PROBLEMS

Interrelated with the project structure are the process problems. The number and types of process problems are endless. The sources of conflict relate to how the project is handled. It focuses on contract administration, contract terms, project management and inefficiencies therein. These process problems may be inherited from the choice of project structure and they may be compounded by people issues.

There has been an abundance of material written on construction contracts.[2] This material addresses formation of contracts, implementation of contracts, breech of contracts and other related areas. When a conflict of interest arises, the first move each party makes is to review the contract documents for direction. These documents are not always thorough nor do they address every situation.

Contract Types

Directly relating to project structure is contract type. In this book, we will focus on contract types as they differ on the "basis of payment." For this reason the classification of contract types will be based on this characteristic. Lump sum, unit price, guaranteed maximum price, cost plus and fixed fee are all examples of different contract types. Each of these contracts have advantages and disadvantages, and can create conflict. Some of these contract types are sometimes synonymous with certain delivery systems, but make no mistake they are different. Project structure and contract type should be chosen on a project-by-project basis taking into consideration each individual situation.

The lump sum or fixed price contract is the most common type of contract. It is also the most adversarial. The general contractor or design-build entity enters into a contract with the owner for a fixed price. This type of contract compels the contractor to cut corners to reduce costs and make a profit. On the owner's side, it requires the owner to provide for monitoring of the contract for quality and compliance as per the contract documents. With this being the most common form of contract, you can see why the industry is plagued with conflict and claims.

One the opposite end of the spectrum it a cost plus contract. The cost plus contract aligns the objective of the owner and the constructor more so than a fixed price contract. In a cost plus contract, the contractor will perform the work for the owner at the cost to him/her plus a percentage for profit. This ensures that the contractor will not lose any money, shifting more risk to the owner. Knowing this, there is the risk that a contractor might take advantage of the situation, by inflating the costs and therefore increasing their profit. In these cases, proper checks and balances need to be provided to ensure that cost increases represent the reality of the project.

A median between the two is a guaranteed maximum price (GMP). In a GMP contract, the owner will reimburse the contractor for all the costs plus a profit up to a certain price. The GMP contract has the benefit of having a fixed maximum price that the contractor must respect, but still allowing the flexibility of being reimbursed for costs. In short, all these contracting mechanisms try to achieve a balance between the objectives of each participant in terms of risk allocation, quality, schedule and cost, among others.

1.3 PROJECT UNCERTAINTY

Equally important as organizational issues are the uncertainties that are present in all construction projects. Even if the correct delivery method is selected, all the process problems have been eliminated and the people issues disappear, project uncertainty will still exist. External uncertainties are those that must be accounted for, but they may not be able to be directly controlled, as they are the result of external forces. Internal uncertainties are unforeseen circumstances that we attempt to account for, but are often unidentified because of lack of information. The area of project uncertainties is inherent because of the characteristics of the industry.

1.3.1 EXTERNAL UNCERTAINTIES

External uncertainties are the result of external forces on the project. They are present in all projects and range form inclement weather, to political risk, to acts of god. They are usually accounted for through insurance policies, contract clauses or other forms of mitigation. In most cases, there is not a person to blame. For example, securing a contract with a government in a country that has a history of political chaos and government overthrows might present the situation where the contract becomes void. After completing half the work and not being compensated, how should the conflict be resolved?

In other instances, Mother Nature seems to find her way onto every jobsite. Rain, snow, wind, fog, extreme temperatures are just some of the factors that impact projects in a negative manner. To combat these uncertainties, it is normal to insert contract clauses that address these issues or identify schedule buffers according to the unworkable days. There are was to proportionate the risks associated with most of the external uncertainties, but they must be identified ahead of time and accounted for in order to avoid conflicts on who is responsible and should pay for it.

1.3.2 INTERNAL UNCERTAINTIES

Internal uncertainties range from errors in design, to unforeseen site conditions to an incomplete definition of scope. In large bureaucratic agencies and long duration projects, internal uncertainties in terms of scope seem to be more prevalent. This is evident as projects that start under one administration, who have defined the scope, may be changed by the succeeding administration with a different agenda.

Unforeseen site conditions are a common source of disputes, even if this risk is allocated in the contract documents. A finger pointing game results when lack of investigation on both the part of the owner and the contractors result in. Examples of these include unexpected contaminated soils or the bearing layer for foundations is deeper than expected. Too many times “fast track” projects become engulfed in conflict because all the parties are running in high gear and they overlook minor details that come back to haunt them midway through a project. Not to mentions that errors and omissions in the

design are present in all projects. However, their impact could be minimized with proper monitoring and control the common statement heard in the construction industry "No design is ever complete."

Dissimilar to the disciplines in the organizational issues, technical and context uncertainties are not interrelated. Political risks do not result from errors in design. Incomplete scope definition does not breed inclement weather. This is different from the organizational issues, as these characteristics are derived from the premise that these uncertainties are present in every project.

The Liquid Nitrogen Gas Tanks Project

After reviewing the sources of conflict in the industry, revisit the LNG Tanks Project. We have already identified the complex project structure, but where's the conflict? After the job got under way, these separate communication and contractual arrangements resulted in total chaos. For example, the civil works contract between the British DESIGNER and the Italian GC was never signed, a "detail" that became apparent only 2 years later when lawyers began compiling the original documentation in preparation for a claim. Presumably, the contract had been misplaced between Venezuela and Italy; hence, it was never returned to the DESIGNER for signature.

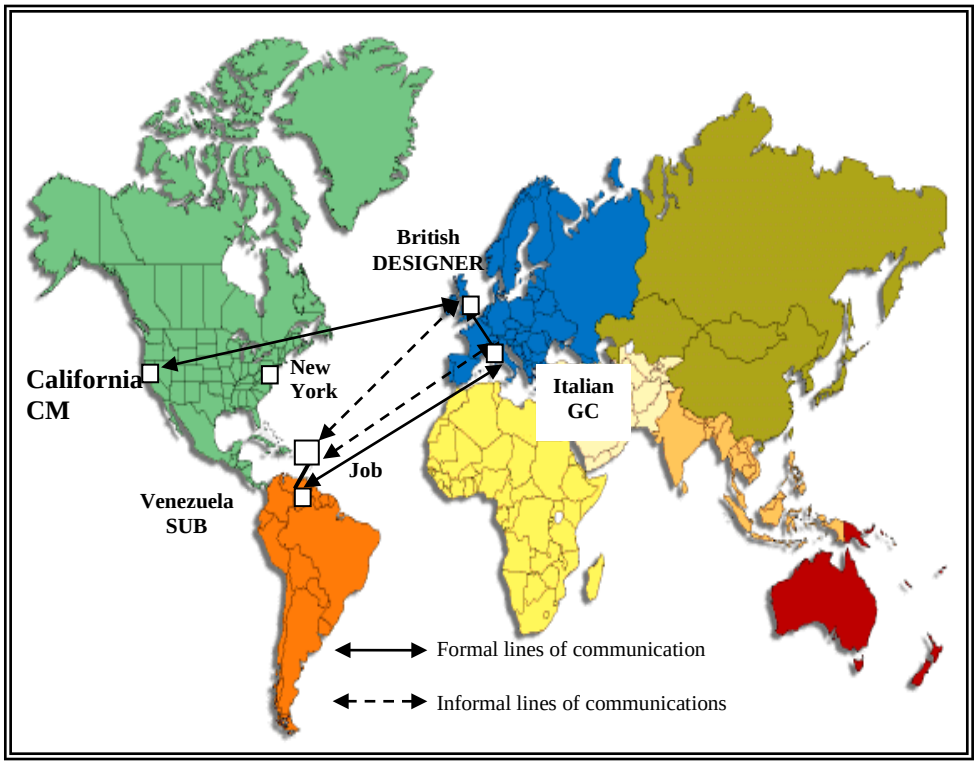

Figure 4 – Worldwide Distribution of Participants with FORMAL & INFORMAL Lines of Communication for the LNG Tank Project

Moreover, halfway into the job neither party had a complete assessment of the status of the design and the work completed. The SUB had invoiced 55% of the contract through the *GC*, but only 30% was in place; major cash-flow problems were affecting the job, and cost overruns were evident in every work item. At that point, the *DESIGNER* took over the *GC* responsibilities, by forcing the Italian *GC* and the Venezuelan *SUB* into takeover agreement. This agreement gave the *DESIGNER* the right to use all the material purchased for the job and all the manpower and equipment the *SUB* had on site at that time. In

addition, the *GC* and the *SUB* agreed to a provision that made them responsible for all costs going forward concerning the civil works package. Therefore, the *DESIGNER* effectively assumed total control over the project, without relieving the two contractors from the cost risk of the project. In other words, the *DESIGNER* could finish the job with whatever resources it considered necessary and charged them to the contract with the Italian *GC*. Any cost over the original base-contract would still be the responsibility of the contractors. Based on this arrangement, the *DESIGNER* brought more personnel from England, provided additional financial resources, and finished the civil works one year behind schedule.

Five months after the take over agreement, the Venezuelan *SUB* and the Italian *GC* reconciled the jobsite and home-office files (formal and informal communications), and proceeded to file a claim against the *DESIGNER* due to changed site conditions and significant design modifications. This claim amounted in value to 100% of the original contract cost and declared the takeover agreement invalid. The *DESIGNER*, in turn, filed a counter-claim against the Italian *GC* for liquidated damages per the original "lumped" contract and for extra costs incurred to finish the job according to the takeover agreement. This counterclaim was worth double the original contract value.

Both claims for this project went to arbitration in New York, as per the contract terms, sometime at the end of 1999, almost two years after the project was actually finished. By mid 1999, the Venezuelan/Italian "team" had spent 3 percent of the original contract in legal and consulting fees, and it was expected to spend another 3 to 8 percent before an award through arbitration may be achieved. No information is available from the British side, but the costs was estimated to be about the same, since both companies have prepared separate arbitration claims using outside consultants. In other words, both companies spent 6 percent of the original contract value, and expected another 6 to 16 percent in arbitration costs without knowing whether they will ever recover those expenses. These costs are in addition to the economic and professional implications of finishing a job one year behind schedule, with significant overtime costs and added supervision.

1.4 SUMMARY

This case, although overly simplified for this introduction, provides a snapshot of some of the conditions that are present nowadays in most large engineering and construction projects: multi-party, multi-cultural, complex contractual arrangements, with international arbitration clauses for dispute settlement. It also highlights the need for new and innovative approaches to communication and contractual relationships, including new ways to resolve disagreements without relying solely on arbitration or litigation. In this example, we saw how inefficient communication and complex contractual arrangements can result in poor job performance. Even though previous experiences in other projects brought some of the team members together, their inability to overcome the contractual framework resulted in claims and costs totaling over three times the original contract value, leading to the following questions. Can these results be avoided? Can attitude changes improve the overall job performance? Could the job have been saved without the costly takeover if the parties had sacrificed a portion of the costs they are now spending on arbitration? Are there mechanisms to improve communication regardless of contract conditions?

The disputes in this case reached the settlement stage, and these questions remain unanswered for this project. Thus, this book presents innovative procedures to promote collaborative environments and resolve disputes in construction contracts. It also presents specific uses and applications of DART across different countries, which have

implemented these techniques and used them within the realm of their own construction industries. The contents in this book represent the state of the art in DART, and they highlight how the industry is coping with some of the problems and project complexities presented above. One of these alternative approaches, or a combination of them, might have resolved the problems in the LNGT project before the takeover agreement. Even in binding arbitration, this book presents certain techniques that could have improved the chances for a "win-win" solution for the claims, at a lower cost to both parties.

These procedures can be used to answer and deal with some of the questions and issues raised by either the LNG project or any other case throughout the world. Companies, universities, professional associations, private groups, industry think tanks, and government agencies have realized the cost implications of poor communication and litigation in construction. The industry as a whole has realized that if legal costs continue to grow unchallenged, productivity and technological innovation will continue to fall further behind, limiting the construction industry's role in the development and improvement of our society.

1.5 POINTS FOR DISCUSSION

1.1 The LNG Tank Project seemed to have a sub-optimal contract structure. What alternative contractual agreements might have been more effective in avoiding litigation?

1.2 When the project started having difficulties the constructors agreed to give up control of the project but still take responsibility for the cost. What motivation did they have for agreeing to these terms?

1.3 With all of the parties from various countries involved, why do you think they chose New York for arbitration of the dispute?

1.4 With the construction industry being as extremely large, accounting for almost 20% of all litigation expenditures in the United States, and increasing 10% annually, why hasn't more effort been put forth to curb these costs?

1.5 How important is dispute avoidance and resolution in the construction industry? Relate this to other construction aspects such as safety, cost and schedule control, or design efficiency?

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1.7 ENDNOTES

[1] This contract included all sub-base preparation, concrete, reinforcing and formwork to be completed above grade for the two tanks (i.e. pile caps, gravel sub-base, slab-on-grade, tank walls, and post-tensioning system).

[2] One such book is: Collier, Keith. Construction Contracts. 3rd edition. Prentice-Hall Inc. Upper Saddle River, NJ. 2001.

CHAPTER 2

EVOLUTION OF DART

"...there has been a veritable explosion in the development and use of new dispute resolution techniques, particularly techniques for resolving disputes at the job site during the course of construction."

(Groton, 1997)

2.1 TRADITIONAL DISPUTE RESOLUTION IN CONSTRUCTION

Not so long ago, dispute resolution had two possible definitions for organizations involved in construction. The first was for a design professional to render a non-binding determination, the other was to proceed to binding arbitration. These were the only real options, other than litigation, available to construction teams to unravel disagreements during the execution of the project. All parties used negotiations to fill the gap between these tools; however, they were mostly performed on the basis of experience, business savvy, and opportunity, without any formal procedure that could promote both a faster and more equitable settlement of the dispute. Litigation was considered too expensive and time consuming, so arbitration became the industry standard as the alternative binding procedure. Figure 5 shows the traditional two-step Dispute Resolution "Ladder" (DRL) with the two resolution tools. This idea of a Dispute Resolution "Ladder" is used

CHAPTER LOOK AHEAD

WHAT IS IT? Throughout the years, ADR procedures have changed, evolved and grown into what is currently used in the industry. Binding arbitration or the determination of a designer to resolve disputes were logical steps, but weakness within these methods led to the development of numerous other methods. Mediation, conciliation, and dispute review boards add flexibility in resolving disputes.

WHO IS INVOLVED? Most of the "new" procedures are not really new. Arbitration has been dated back to Ancient Greece. The search for truth and a mutually acceptable solution evolved during the Confucian era in ancient China. In the Netherlands, the concept of Frame Contracts incorporates objective alignment and trust to reduce conflict. It goes to show, that DART have developed around the world.

WHY IS IT IMPORTANT? Problems can be solved with a particular technique, but does the answer make sense if you don't understand how the technique was derived. By looking at why these methods were developed, it allows for enhanced implementation of these procedures.

HOW TO APPROACH IT? Review the traditional dispute resolution ladder and contemplate the pros and cons. Study the development of the Six-step DRL and how it adds flexibility to the dispute resolution process.

KEY CONCEPTS

to organize dispute avoidance and resolution techniques for construction projects, and it is further described in Section 2.3.2.

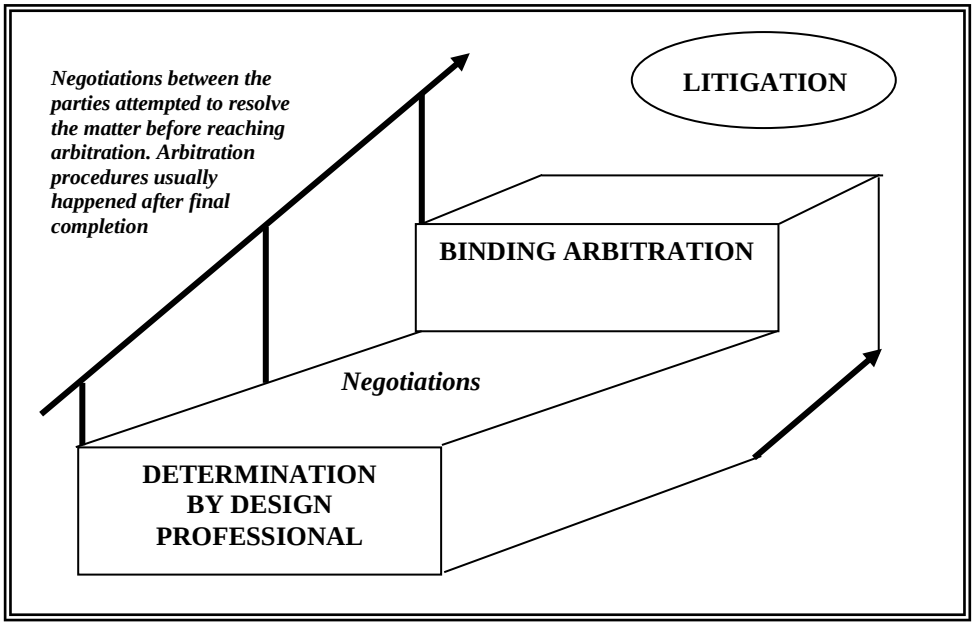

Figure 5 – Traditional Two-Step Dispute Resolution "Ladder" in Construction Projects

In this ladder, the design professional played the role of a first step in the process of resolving disputes. The contractor submitted inquiries and disagreements to the design professional representing the owner, and then expected prompt, knowledgeable, and unbiased answers. If either the owner or contractor objected to the determination of this third party, the matter usually escalated and it was left to arbitration. As discussed above, and shown in Figure 5, negotiations were used to fill the "gap" between the first and second step in the ladder. In this stage, either the owner or the contractor has become involved to formally prevent conflicts and disagreement. An exception to this is perhaps attempting to transfer project risks to the opposing party in an effort to limit individual liabilities. Design-Build projects are based in part on this notion of reducing the owner's exposure to design problems, by assigning both the design and the construction responsibility to only one party.

The second step in the ladder, Arbitration was the preferred alternative to litigation for the resolution of construction disputes because it offered *"...a limited process, a relatively prompt hearing, privacy, informality, and above all, [*an*] informed judgment"* (Stipanowich, 1996). This is how arbitration became a "*sine qua non of construction contracting*," and gained popularity as a standard clause in most contracts. If the first step of the ladder failed to resolve the dispute, arbitration procedures were usually delayed until the project was completed. The two dispute resolution steps of the traditional construction DRL, are discussed in more detail in the following two sections.

2.1.1 DETERMINATION BY THE DESIGN PROFESSIONAL

In "traditional" design-bid-build delivery methods, the resolution of construction disputes has been the responsibility of the project architect/engineer for a long time. It was considered logical that the design professional, who drafted drawings and contract specifications, made determinations with regards to interpretations, and related conflicts

between the owner and the contractor. The decisions of the architect/engineer were backed by their profound knowledge of the technical considerations of the project, something that gave them the authority to resolve almost any matter related to their 'creation'. The decisions of the design professional were usually not final nor binding on the parties, but they provided a fast, knowledge-based, "objective" solution to jobsite disputes.

Nevertheless, as contracts became larger, the technical complexities increased and the number of parties expanded, the quantity, frequency, and size of project disputes also increased. The dollar amount of contract disagreements became larger and delayed completion time brought additional problems. Although it was often assumed by owners that the evaluation of disagreements would always be conducted by their own on-site agent (engineer or architect), the changes described eventually undermined the position of the agents and they were finally considered not in the best position to propose or evaluate the merits of an equitable settlement.

Among the major concerns that led this transformation was the possible conflict of interest as the design professional was not truly neutral. A contractor seeking compensation from the owner because of a contractual problem involving administration, design, and/or contract interpretation elements was not likely to find an objective decision originating from the agent, since this last was an actual part of the condition being claimed (Stipanowich, 1996). Furthermore, in disputes regarding errors or omissions in the contract, the design professionals frequently became a defendant, so their role as an 'unbiased third party *resolver'* of disputes lost credibility. At that point the owner was left to face what often were disputes that could not be settled by the people they had assumed would be responsible of doing so during the project.

The role of the design professionals as the first step in the DRL has lost significance, especially in large, complex projects where their decisions can be challenged in other forms of binding adjudication, or where they can become a part of the dispute. Although the design professional still remains the primary interpreter of design and specification requirements, their role as a dispute resolution adjudicator has been reduced significantly. Still, the benefits of having an unbiased, knowledgeable third party involved in the resolution of construction disputes is still recognized by the industry (i.e., objectivity, speed, decisions backed by technical know-how, and an understanding of the project) as it will be demonstrated in further examples of third-party ADR techniques. Thus, it can be argued that the concepts of Neutral Advisors (Section 6.1) and Dispute Review Boards (Section 6.3) have been developed by the construction industry as substitutions and improvements of the role played by the design professional in the traditional DRL.

2.1.2 ARBITRATION

This section presents two cases of early applications of arbitration as a dispute resolution technique, together with the use of arbitration in the construction industry. The two cases provide two important lessons for the use of arbitration in construction dispute resolution. First, the Greek case shows how arbitration was implemented as a dispute resolution system. Then, the use of arbitration in the Middle Ages in England shows how this technique followed a path towards rigidity and formalization as its use increased just like arbitration in construction during the past fifteen years.

Arbitration Experiences in Greece

In an article published in the Dispute Resolution Journal, King *et al.* (1994) described the use of arbitration by the Greek city-states. The authors reported that by 500 BC arbitration had reached almost universal acceptance throughout Greece, where it was

often used to resolve commercial problems between citizens, and as a diplomatic resource between city-states. These early uses of arbitration provide an interesting example of how alternative dispute resolution (i.e., arbitration) has been an integral part in the evolution of human relationships. Furthermore, it appears that the reasons behind the development of arbitration in Ancient Greece are also associated with flexibility, privacy, and economy; the characteristics that allowed arbitration to become a pivotal part of the Traditional DRL. The following case helps illustrate these observations.

According to the article, the Athenian democracy was rooted in the success of commercial arbitrations conducted by Solon, a well-known Athenian lawmaker[1]. At the time, increasing social unrest required a prompt resolution of disputes; something that Solon achieved by proposing knowledge-based, fast, and mutually beneficial resolutions (sometimes the fallback was war). Just like some models in the present time (e.g., expert determination and arbitration), the decisions of a third party neutral were final and not eligible for appeal, as they were considered the judgment of city-state appointee to solve the discords. These characteristics which made arbitration the dispute resolution system in ancient Greece are also the some features that fostered its incorporation in the DRL of the construction industry: fast solutions based on knowledge and experience, flexibility, and finality.

Arbitration in Old England (602-1698)

Another case of ancient applications of arbitration is found in the history of Old England from the Dark Ages to the end of the Middle Ages, where arbitration was a conciliatory process used as a true alternative to litigation. Arbitration's function was to reconcile the parties and allow them to sustain long-lasting business relationships. Arbitration was embodied in the medieval institution of the "loveday,"[2] and was essentially a form of mediation .

> *"When two merchants found themselves in dispute …they went to a colleague, and agreed to abide by his decision. In many trades, there was no need for enforcement of awards at law. If a man failed to comply with an arbitral award, [he/she] faced commercial ruin when his peers were no longer prepared to give him credit or to deal in his goods. Chambers of Commerce and trade associations played an active part in arbitration."*
>
> Beresford Hartwell (1998)

However, as disputants began to use arbitration as a substitute to court litigation, arbitration acquired some of the characteristics of the legal system; something that gave raise to a pseudo-adjudicative variety of the technique that grew as the commercial community used it more and more. Consequently, from the late Middle Ages through the early modern period loveday arbitration changed, as potential abuses of the process and evolving notions of community, competition, and individualism contributed to the disappearance of arbitration as a conciliatory process (Yarn, 1995).

It can be seen from this how arbitration evolved from a purely conciliatory process to an adjudicative system, as its use by the business community and the courts increased. This evolution is similar to the one found in the arbitration of construction disputes today.

Arbitration in the Construction Industry

As mentioned in the traditional two-step ladder, if the parties failed to reach an agreement with the design professional, the only alternative was binding arbitration. Arbitration clauses became the standard in agreements between owners, designers, and contractors, functioning as the dispute resolution technique instead of litigation. Standard contract forms issued by professional associations like the American Institute of Architecture

(AIA), the Association of General Contractors (AGC), and the Chartered Institute of Builders (CIOB) all incorporated arbitration as their only dispute resolution alternative. International organizations like the World Bank and the Federation Internationale de Ingenieurs-Conseils (FIDIC) also supported the use of this technique. However, with the increasing acceptance of arbitration as a substitute for litigation, the technique began to develop problems as it became more rigid and costly.

According to Stipanowich (1996), arbitration was *"...subjected to the stresses and strains borne by its expanded use."* Furthermore, as courts began to accept the system, they proceeded to delegate in arbitrators the *"...burden of almost the entire spectrum of civil rights and remedies,"* creating increasing demands for rules and procedures to accommodate the expanding needs of the final users, something surprisingly similar to the extinction of the "loveday" concept in Old England. In response to these demands, arbitration was forced to adopt certain characteristics from civil litigation, such as *"extensive discovery, multi-party practice, awards of attorney fees, and written opinions by the arbitrators"* (Stipanowich, 1996). Due to these pressures and strains, arbitration lost some of the features that had made it the preferred dispute resolution technique in the construction industry: flexibility, privacy, decisions based on technical know-how, and economy.

The problems experienced by arbitration are reflected in the results of an American Bar Association (ABA) sponsored survey completed in the mid-1980's. The study reviewed the perceived advantages and disadvantages of arbitration in the resolution of construction disputes, and its respondents, mostly construction attorneys, identified their major concerns with this form of ADR. Table 5 summarizes the ABA results and connects them to the features responsible for the initial popularity of arbitration in construction.

Table 5 – Problems with Arbitration in ABA Survey 1988 and their connection to the Features of Arbitration identified (Stipanowich 1996)

Problems reflected in ABA Results	Arbitration Features
1. Problems regarding the speed and efficiency of arbitration in larger cases, which made arbitration expensive.	(Economy and Flexibility)
2. Need to consider mechanisms to deal with multi-party disputes.	(Flexibility)
3. Problems regarding the quality of construction arbitrators.	(Economy, Knowledge-based decisions, and Flexibility)
4. The need to support greater use of preliminary hearings and pre-arbitration orders to organize and expedite the actual procedure.	(Economy)
5. The need to increase the power of the arbitrator to order sanctions for delays and 'non-cooperation'.	(Economy and Flexibility)
6. Objections as to the appropriateness of a written award by the arbitrator explaining the reasons for the decision.	(Privacy)

These concerns about arbitration within the ABA confirmed that the system had developed some of the inherent problems of litigation due to its excessive use. In fact, the views presented by points 4 and 5 above suggest that arbitration was being abused by the disputants and their legal representatives, just as it happens in litigation. This is exemplified by a study by Flood et al. (1993) on this subject in the UK, which concluded that lawyers had *"...essentially 'juridified' the field [of arbitration], making the procedures rigid, costly and time consuming, with the many drawbacks attributed to litigation."* Arbitration had become an adversarial procedure.

Examples of ancient Greece and England show how arbitration in construction evolved into a pseudo-adjudicative and adversarial system with many of the features that had made litigation the least preferred dispute resolution technique. In the next case a final journey to ancient history is presented to illustrate how dispute resolution has been carried out in Asia since the fourth century BC as a conciliatory practice focused in maintaining the relationship between parties.

Confucian Philosophy

In the Far East, the concepts of resolving disputes by conciliation date back to the times of Confucius (511-479 BC). The Chinese base their dispute resolution processes *"...on the Confucian view that the optimum resolution of a dispute should be attained by moral persuasion and compromise instead of by sovereign coercion"* (Chau, 1992). According to Li (1970, cited by Chan E., 1997), the Chinese preference is to encourage people to settle disputes amicably.

This philosophical approach is based in a common Asian tradition to seek "harmonious" solutions that help maintain relationships over time. Judges and mediators are considered the same in Asia, for what parties seek is a well-known go-between that is also familiar with their disagreement. The idea is that the third party helps them bring an end to their dispute while assisting in reaching a mutually agreeable solution. What they seek is a solution with as little "loss of face" as possible. In Japan, the existence of a dispute may itself cause a "loss of face," and having to submit a dispute to a third party may represent some sense of failure.

Under Confucius' traditions, litigation is viewed as the last resource. Consider that China has over 10 million mediators versus only 15,000 lawyers. Local People's Mediation Committees, with three to 10 members, mediate 7 million cases a year and they reach agreement in 90% of the cases (Pierce, 1994). Discussion and compromise are always preferred, and all adjudication procedures where a third party decides the matter are considered adversarial in nature. In contrast, conciliation and mediation are always favored, as informal, person-oriented approaches, unbound by the strict rules of highly structured procedures. It is less important in Confucianism to be accurate in finding the truth. What this philosophy truly considers important is to determine a common ground in which parties can negotiate a settlement without ever disrupting their "harmonious relationship" (Scott, 1995).

2.2 MODIFICATION OF THE TWO-STEP ADR APPROACH

The previous sections have shown how the two initial steps in the traditional dispute resolution ladder have reached a point in which they no longer can successfully cope with the growing needs and challenges of today's construction environment. The industry has been forced to look beyond the architects' determinations and binding arbitration as the sole mechanisms to solve professional and commercial disputes. The new instruments, paradoxically, have tried to incorporate the lessons of ancient Asian philosophies, in a

quest for improving their current effectiveness and ultimately their bottom lines when dealing with conflict.

As described, the traditional dispute resolution ladder has experienced some problems as the size and complexity of projects expanded. This section presents three examples that illustrate how the ladder has been gaining "steps" as parties incorporate new ADR techniques to bridge the gap between the design professional's initial determination and the binding arbitration stage.

2.2.1 FIDIC'S ADR CONTRACT CONDITIONS

The most frequently used form of international contract conditions for civil engineering and construction projects comes from the Federation Internationale de Ingenieurs-Conseils (FIDIC) - the *Conditions of Contract for Works of Civil Engineering Construction*), also known as the "Red Book." Until recently, this standard contract was drafted under the assumption that construction claims should be set aside during the work, and then resolved at the end of the project. Arbitration was the only alternative to litigation if parties failed to agree with the architects/engineer's determination[3], but it could only be initiated after final completion of the project. Clearly, what the FIDIC was using was the two-step traditional DRL described in Section 2.1.

The first edition of the Red Book in 1957 included a dispute resolution clause stating that *"...the arbitrator/s shall not enter on the reference [*dispute*] until after the completion or alleged completion of the works unless the parties otherwise agree."*(FIDIC, 1957) Claims, and the process to resolve them, were considered a distraction to the construction, confirming the notion that the job came first, and that claims should be put aside until the end of the project. More recently, however, there has been a trend to address and resolve claims as early as possible. Molineaux (1995) suggests two important reasons behind this new approach from the viewpoint of the owner:

1) *"To avoid or lessen the origin of the claim, by taking the necessary actions in response to the problem; for example, a design change to meet new subsurface conditions; and*
2) *To monitor the alleged extra costs being incurred by the contractor for future review and possible negotiation."*

Additionally, an early treatment of claims also means that owners can attempt to isolate troubles from the rest of the project, which enhances flexibility and reduces their effect on other activities. The 1987 Edition of the FIDIC contract had already taken into consideration these developments, and addressed the need to resolve disputes during the execution of the works by means other than arbitration. This Edition included a requirement to attempt an "Amicable Settlement" before arbitration could actually start. Clause 67.2 of the Red Book stated (FIDIC, 1987):

> *"Amicable Settlement – Where notice of intention to commence arbitration's to a dispute has been given in accordance with Sub-Clause 67.1, arbitration of such dispute shall not be commenced unless an attempt has first been made by the parties to settle such dispute amicably. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which the notice of intention to commence arbitration of such dispute was given, whether or not any attempt at amicable settlement thereof has been made"*

This clause is an encouragement for parties to resolve the dispute without recurring to arbitration by making them wait considerably before arbitration can begin. This passage

is also an acknowledgment that there are other mechanisms available to deal with problems between parties to a contract.

In terms of promoting early resolution of claims, the FIDIC reinforces the claims' notification process. In the 1987 Red Book Edition, contractors are required to notify the engineer within 28 days after the event giving rise to the claim is first noticed. From that date forward, the contractor is required to keep updated files on all costs associated with the claim, and to make the material available to the engineer for review, without requiring from the engineer an acceptance of any liability. Failure to comply with these requirements automatically reduces the amount the contractor can claim at a later date.

From his role of Chairman of the FIDIC Committee of Conditions of Contract, Seppala (1991) identified three major advantages of the Federation's procedure just described:

1) *"The engineer can investigate the facts of a claim and its financial consequences while the evidence is still fresh and available;*
2) *The owner receives a prompt notice of possible adjustment to the contract price; and,*
3) *The earlier claims are identified, the sooner they may be resolved."*

The system makes both parties responsible, and creates an obligation to deal with disputes in a timely and professional manner. In short, by preventing arbitration and encouraging early claim notification the FIDIC has both introduced an ADR system and promoted an expedite process that saves time and resources to the parties involved. Yet, a point that is still missing is clause 67.2's failure to describe what parties should do during the waiting period before arbitration. Not clearing the article terms might only serve to delay arbitration for almost two months.

2.2.2 WORLD BANK'S ADR CONTRACT CONDITIONS

Whereas the FIDIC has left open the possibility of using some form of alternative to arbitration after the architect/engineer's decision is rejected, the World Bank has gone a step further and has actually recommended the use of a Dispute Review Board (DRB) as the method to resolve construction disputes. In its May 1993 Standard Bidding Documents, the World Bank suggests the following:

> *"In case of major projects, IBRD [World Bank] encourages employers to consider introducing a dispute review board (DRB) into the contractual settlement of dispute procedure ... Such a DRB could either replace the engineer under Clause 67... or it could review the decisions made by the Engineer" (cited by Molineaux, 1995).*

For smaller contracts, the World Bank has also introduced the concept of an "*adjudicator*" to function as the first step in the resolution of disputes:

> *"The adjudicator is the person appointed jointly by the employer and the contractor to resolve disputes in the first instance. The adjudicator is … required to provide a decision within 28 days. If no party submits the adjudicator's decision to arbitration within 28[days] of receipt the decision is considered final and binding" (Molineaux, 1995).*

These two conditions represent a significant improvement over the standard FIDIC contracts in relation to dispute resolution procedures. Not only has the World Bank recognized the existence of alternatives to arbitration - by recommending two options depending on the size of the project, but also it has replaced the role of the designer in small contracts as the first-instance resolver of disputes. In large contracts, the World

Bank has incorporated a dispute review board as a new step in the resolution process between the designer and arbitration stages.

2.2.3 CHEK LAP KOK AIRPORT'S DISPUTE RESOLUTION SYSTEM

As a final example of the modified two-step DRL approach, this section presents an actual case from Hong Kong. In this Asian country, construction contracts with the government usually include a three-step dispute resolution process shown in Figure 6. Just like in the two-step process, the design professional is responsible for the first determination as to any disputes regarding the contract, and arbitration is the final binding mechanism for settlement. However, a Mediation stage is added as an in-between step, if the parties disagree with the design professional's decision. In this case, mediation is not mandatory, and the opposing party can refuse to participate in the mediation procedures.

In the event mediation fails or one of the parties refuses to participate, the Hong Kong government establishes that the dispute can be referred to arbitration, but only after the conclusion of the project. In other words, the contract makes the completion of the works a condition precedent to any final solution of disputes that may occur during construction, just like the 1957 Edition of the FIDIC contract reviewed in Section 2.2.1.

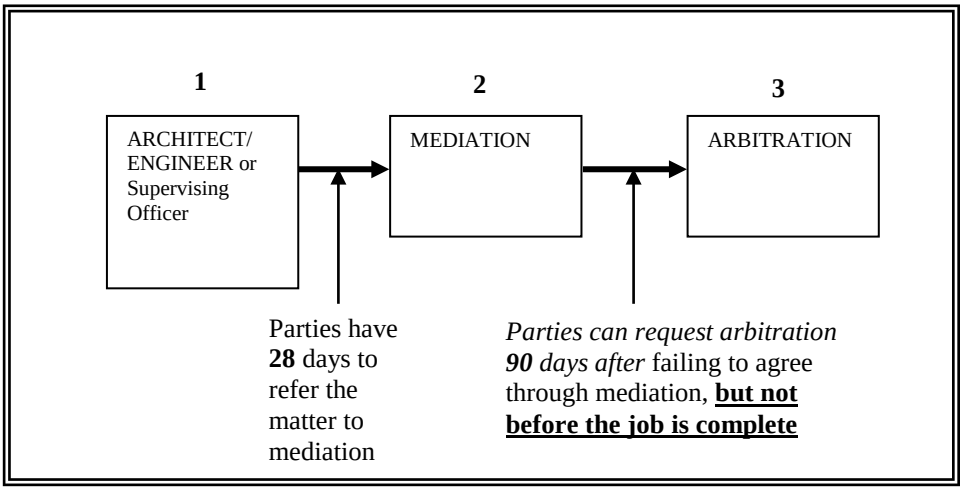

Figure 6 - Standard Dispute Resolution Process for Government Construction Contracts in Hong Kong

For the construction of the Chek Lap Kok Airport, the government developed a specific, *modified* dispute resolution system based on the three-step process described above. During the negotiations between the Airport authority and the local contractors, the local contractors exerted a great deal of pressure for a faster and more efficient dispute resolution procedure than the one shown in Figure 6. The biggest hurdle in the negotiations was a condition that *"arbitration was only possible after the project's completion,"* and the contractor insisted on a mechanism that could address the large number of disagreements expected in a project of such complexity. The resulting dispute resolution process is shown in Figure 7.

Two methods for dispute resolution were incorporated into the contract to satisfy contractor's demands regarding dispute resolution. Figure 7 shows these two methods, which have been labeled here as A and B to help the reader.

Under method **A**, parties submitted to the engineer representing the Airport Authority a Notice of Dispute as the first instance for resolution. Mediation followed if the Engineer's determination was not acceptable to one of the parties. Opposed to the standard dispute resolution procedure (Figure 6), in this case mediation was mandatory and had a time limit of 42 days before the parties escalated the dispute to the adjudication stage. In addition, the Hong Kong government tightened this modified system by requiring from the mediator 1) a final report on the findings[4], and 2) specific recommendations to the parties involved.

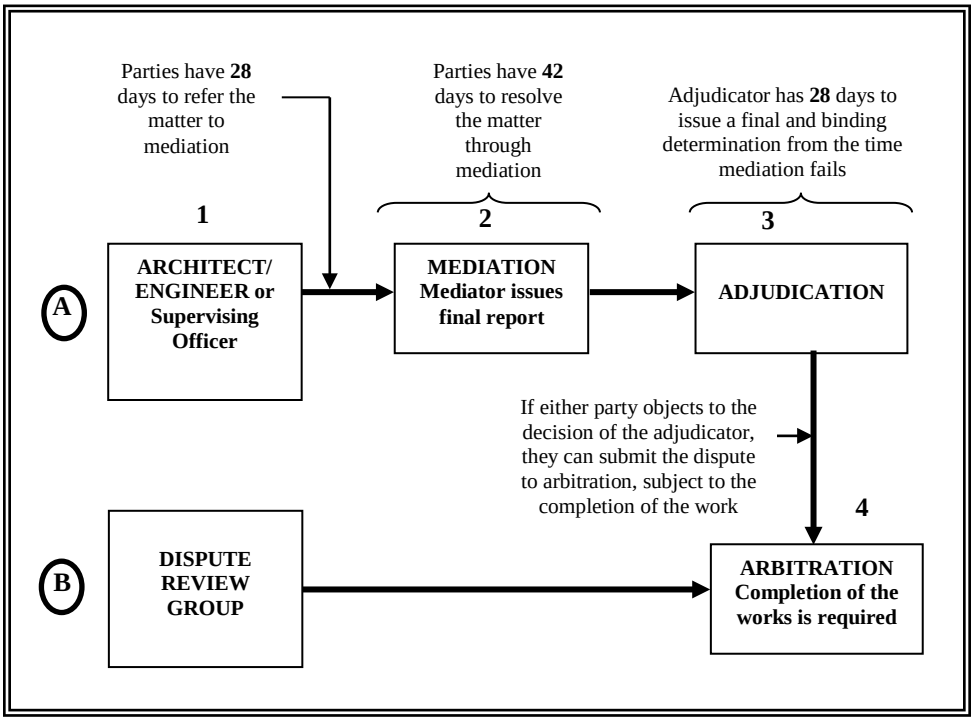

Figure 7 - Dispute Resolution Process for Hong Kong's Airport Core Program

If mediation failed, or one of the parties disagreed with the report, the matter was submitted to an Adjudicator for binding determination. According to Fenn *et al.* (1998), the selection of this adjudicator was handled through the Hong Kong International Arbitration Center (HKIAC) and involved the following steps:

> *"Parties submitted to the HKIAC at least three names of people willing and able to act as adjudicators;*
>
> *The HKIAC combined these lists and returns them to the parties;*
>
> *Each party ordered the combined list based on their preference, and*
>
> *The HKIAC then appointed the individual with the highest rating."*

If parties failed to select an adjudicator the HKIAC could appoint one of its choices, from the list, or from its registered adjudicators (arbitrators). Once appointed, the adjudicator had the widest discretion permitted by the law to select the procedure and to ensure a just, expeditious, and economical resolution of the dispute within 28 days. This adjudicator acted as a Single Arbitrator (Section 8.3.1), and was required to provide a written statement identifying the dispute, the reasons for the decision, and any admissions made

by the parties during the proceedings. The awards of the adjudicator were binding, but could be appealed in arbitration after the completion of the project (Fenn et al., 1998).

Under method B (Figure 8), the contract incorporated the authority of a Dispute Review Group (DRG), consisting of seven individuals. The DRG visited the construction site once every three months and spent there four and a half days reviewing the project and attending Quarterly Meetings between the contracting authority and the different contractors in order to maintain current knowledge of the status of the works.

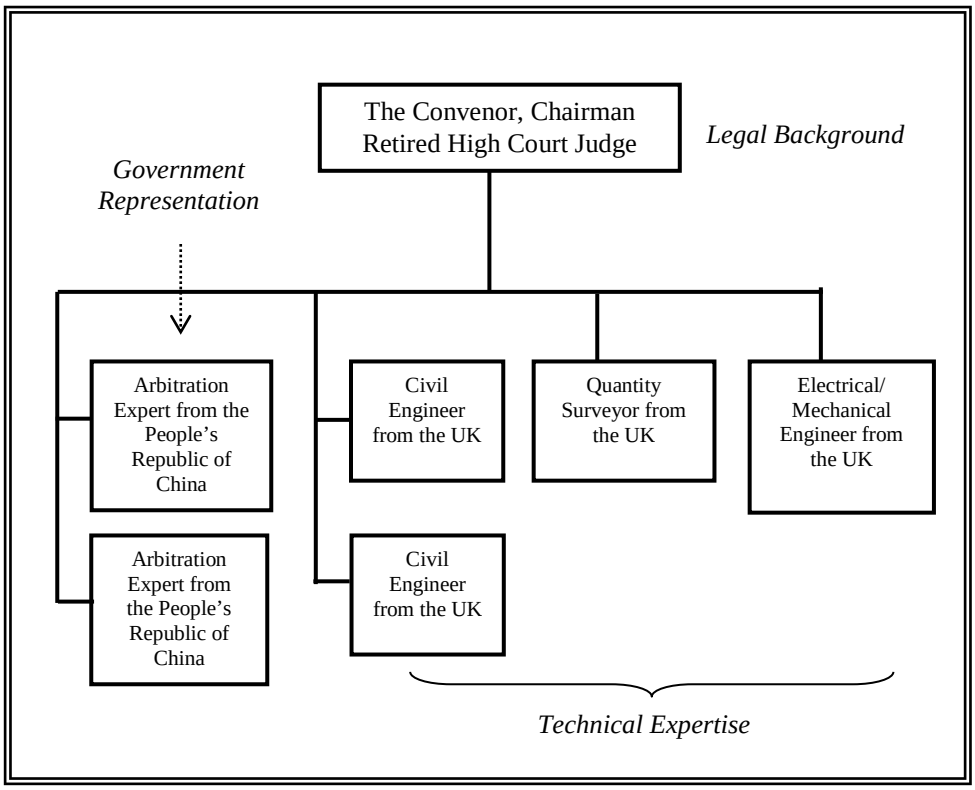

Figure 8 - Composition of the Dispute Review Group for the Chek Lap Kok Airport Project, Hong Kong

An interesting aspect of the DRG is how it was organized in terms of expertise and representation of each party in the project. Although modeled as a Dispute Review Board (described in Section 6.3) in this case the contractors had no direct representation. Thus, DRG was more like an Agency Review Board (Section 6.2) in which the Convenor provided the legal background to any review and/or decision by the DRG. Arbitrators from China represented the government, and at the same time were the experts in arbitration procedures. The technical expertise to review construction and design issues was provided by professionals from the UK. Although it is unclear how one method was selected over the other for each claim, it appears that the larger contracts (i.e., Airport Terminal Building) used the DRG, or method B.

Under both methods, A and B, arbitration was left as the final stage to resolve disputes, to be used only after the project was completed. Arbitration awards in Hong Kong are usually in writing, are signed by the arbitrator, and in most cases provide the reasons for the award. Arbitration awards are final and can only be appealed when an issue of law is in question.[5] The awards are enforceable in the same manner as a judgment.

For the construction of the Chek Lap Kok Airport contractors were able to modify the standard dispute resolution clauses of the Government of Hong Kong and develop two alternative approaches to address disputes more efficiently. By combining non-binding techniques, like Mediation and an Owner Review Board, with more binding determinations they were able to expedite processes and better document the project. However, this case did not introduce a change in the requirement to finish the project before being able to submit a claim to final arbitration.

To sum up, the examples presented above have shown how the traditional two-step DRL (Section 2.1) has been modified with new techniques (i.e., Mediation, Dispute Review Board, and Adjudication) added in between the designer's determination and arbitration. The World Bank contract and the Government of Hong Kong have actually replaced the design professional by introducing the figure of a Standing Neutral to provide the initial evaluation and recommendation on the conflict matter. The following section will present the evolution of the two-step ADR model, portraying its expansion to include a number of new 'steps' that offer the parties increased flexibility, reduced costs, and a better chance to preserve their relationship.

2.3 EVOLUTION OF THE PRESENT ADR METHODOLOGIES

As new methodologies have been developed and implemented, the number of approaches, techniques, and philosophies to deal with disputes in construction has grown significantly, especially during the past several years. Moreover, because of the uniqueness of each project and the differences in international practices, project teams to suit their specific requirements, creating new and innovative approaches to dispute resolution, constantly modify existing models. According to Groton (1997), *" ... there has been a veritable explosion in the development and use of new dispute resolution techniques, particularly techniques for resolving disputes at the job site during the course of construction."*

2.3.1 DATA SUPPORTING THE EVOLUTION OF ADR

Since the 1976 conference of the American Bar Association – known as the Pound Conference, the growth in the use of ADR in the American court system has been exponential. While in 1980 only 18 states had some type of ADR program as part of their court system (Court-Annexed procedures), by 1990 all 50 states and the District of Columbia had incorporated a program, and by 1993 more than 1,200 court-related ADR programs were in place (Ide, 1993). This growth of ADR in the US court system has been fueled by the success of Court-Annexed procedures in the early resolution of disputes. For example, a mandatory ADR program[6] carried out by the Commercial Division of the New York County Supreme Court achieved settlements in 52% of the cases, and contributed to the resolution of the dispute in another 16% of the cases (Meade, 1997). In other words, the ADR program positively affected 68% of the disputes in this Court.

Further use of ADR in the US is promoted by the Dispute Resolution Act of 1998, which actually instructs Federal district courts to require all litigants in civil cases to consider the use of alternatives to litigation. According to this bill, courts can direct parties to use ADR at any point during the legal procedures, in an effort to expedite the resolution of the matter and allow greater flexibility. The parties can now resort to ADR during litigation, without giving up any advances made at the court level or losing their right to continue with the court proceeding if ADR fails.

At the State level, for example, the Governor of New Jersey signed a bill during the first quarter of 1998 that requires disputes in public construction projects to be submitted to an alternative dispute resolution procedure before court litigation (DRT, 4/1998). The bill recommends various specific ADR options such as mediation (Section 7.2), non-binding arbitration (Section 7.4), or binding arbitration (Section 8.3). In this document, not only has the government of New Jersey identified construction as a major source of civil litigation, but also it has recognized the fact that DART can improve the resolution process, increasing the chances for a faster, more efficient settlement of disputes with less court appearances.

Two surveys by the American Bar Association further confirm the increasing use of DART in construction. The first one, conducted as part of the ABA 1990-91 Forum on the Construction Industry found arbitration to be the most frequently used form of ADR in disputes with 81.5% of those surveyed having experience with the procedure (Stipanowich *et al*., 1992). Many participants also reported the use of mediation, with 64.2% of the respondents having some experience with it, and 58.3% having mediated a dispute in the last two years. In terms of the success of DART, the results of this survey showed that 57.4% of cases resulted in full settlement, and in 8.4% of the cases a partial settlement resulted. These results are similar to those obtained by the New York Supreme Court as reported by Meade (1997) above. The second survey, conducted in 1993 by the ABA Public Contract Law of the Alternative Dispute Resolution Committee, further confirmed the increasing use of DART to resolve construction disputes. Arbitration was still the most familiar method of dispute resolution among those surveyed, but mediation was now rated as the most favorable approach (Stipanowich, 1994).

A 1994 study by the US National Transportation Board on dispute resolution methods found that 22% of State transportation departments had incorporated dispute review boards (Section 6.3), 63% used partnering (Chapter 4), 70% “empowered” field personnel to handle disputes (Section 5.5), and 100% were willing to negotiate (Chapter 5) with the contractor (Civil Engineering, 1994). In April 1996, thirty-three of the most influential US organizations and federal agencies in the construction industry signed a declaration calling for the end of litigation in project disputes (ENR, 4/22/1996).

The numbers demonstrate how in the United States the use and popularity of ADR extends beyond the field of public contracts and construction. An additional survey conducted in 1997 by Price Waterhouse, Cornell University, and The Foundation for the Prevention and Early Resolution of Conflict (PERC), revealed that 528 of the largest corporations in the United States reported extensive use of ADR (Lipsky *et al.*, 1997). The results, summarized in Table 6, reflect the opinion of chief litigates, deputy counsels, and corporate counsels of the corporations responding to the survey.

Table 6 - Summary of Results of Survey on the Use of ADR (Lipsky et al., 1997)

ADR METHOD	***Percent of Respondents who had experience with this method of ADR***	***Percent of Respondents who expect to use this method of ADR in the future***
Mediation (Section 7.2)	88%	84%
Arbitration (Section 8.3)	79%	69%
Med/Arb (Section 8.1)	41%	Data not available
Mini-trials (Section 7.6)	23%	Data not available
Fact Finding (Section 7.5)	21%	Data not available
Peer Review (Section 6.1)	11%	Data not available

As shown above, mediation was the most favored ADR approach in this sample of Corporate America. According to the answers provided, 88% of these corporations had used mediation to resolve disputes in a number of fields (i.e., labor relations, employee termination, drug testing, and lawsuits brought about by customers). Arbitration was the second most favored ADR technique, with 79% claiming experience with this method. Interestingly enough, the technique that combines mediation and arbitration (Med/Arb) was the third most frequently used approach. Med/Arb (Section 8.1) has encountered some resistance because of the two roles played by the third-party neutral and the type of information that can and should be disclosed during mediation without affecting the possible arbitration process.

In terms of the expected reduction in the use of Mediation and Arbitration shown in Table 6, the survey attributes it to concerns declared by the respondents as to the qualifications of the third parties involved in the procedures. Almost half expressed "*...a lack of confidence in the arbitrator*" (Lipsky et al., 1997) and close to 30 say there are not enough qualified arbitrators. With regards to mediators, 30% of responses raised the issue of lack of confidence and 20% the problem with qualifications and experience.[7]

The higher concerns expressed with regards to the arbitrators can be explained by the fact that their decisions are final and binding, while the mediator does not even offer a solution proposal.

The survey also revealed some other interesting aspects of ADR in American corporations:

- Smaller companies were found to be more inclined to follow adjudicative procedures. They make a very limited use of ADR.
- The selection of ADR methods was found to be related to the type of dispute (DRT, 1/1999):
  - Mediation is preferred to arbitration in all types of disputes except international cases, where 50% of the respondents said they would use arbitration, while only 43% would attempt mediation.
  - In personal injury disputes, 60% have used mediation, but only a third have used arbitration.
  - In product liability cases, 40% have used mediation, versus only 24% that have used arbitration.
  - In long-standing relationships and contracts, 92% of the cases where mediated.

These findings show how ADR provides a flexibility to select how disputes will be addressed and resolved that is not found in the court system. Corporations are selecting different ADR methods for each type of dispute, as ADR has allowed them to tailor their approach to each specific case.

In response to this evolution of ADR methods, the construction industry has incorporated to the traditional DRL numerous methodologies to avoid conflict and to resolve disputes more creatively and efficiently. These changes have contributed to the creation of a construction DART model. The authors of this book have identified two models of conceptualization of DART that are presented in the following section.

2.3.2 TWO CONCEPTUALIZATION MODELS OF DART

This section provides a model for the organization and implementation of Dispute Avoidance and Resolution Techniques (DART). Two different schemes for the organization of construction DART are reviewed, and the Dispute Resolution Ladder

(DRL) has been chosen and implemented in the following chapters for all the techniques found by this book. This selection is based on two features of this model; first, the DRL model lends itself to practical applications and second, it gives a significant importance to dispute prevention techniques by placing them as the first step in any successful system of dispute resolution in construction.

Differentiation between conflicts and disputes

A first model of organization DART is proposed by Fenn *et al.* (1997) based on a differentiation between conflicts and disputes in construction. You must first acknowledge the construction industry exists within an adversarial society and conflict is eminent. Fenn *et al.* (1997) argue that since it always will exist, conflict can be managed as any other variable in construction. The goal is to manage the differences/conflicts between parties to the point of preventing them from leading to a dispute. The rationale is that organizations can learn from conflict, whereas disputes are not *manageable* by the parties, and they require some form of final determination. By needing this determination to resolve the dispute, this part of the process lends itself to be aided by the intervention of a third-party.

Moore (1989, cited by Fenn *et al.*, 1997) proposed a *"conflict continuum,"* on which the *"construction industry conflict continuum"* is based and presented in Figure 9.

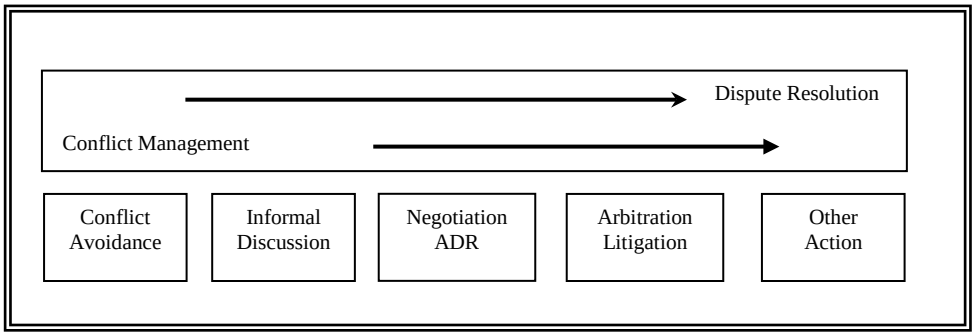

Figure 9 - Construction Industry Conflict Continuum (Fenn et al., 1997)

In this continuum, a taxonomy that differentiates techniques is proposed based on their usage to manage conflict or resolve disputes, also discriminating between non-binding and binding ADR methods (Figure 10). This classification introduces means to manage Organizational Issues and Project Uncertainty (Section 1.1) without delay, as these features of construction can easily deteriorate and their negative effects can be exponential if conflicts are not timely addressed and they evolve into disputes.

Conflict Management

Non-Binding
Dispute Review Boards
Dispute Review Advisors
Negotiation
Quality Matters
- Total Quality Management
- Coordinated Project Information
- Quality Assurance

Procurement Systems
Partnering

Dispute Resolution

Non-Binding	*Binding*
Conciliation	Adjudication
Executive Tribunal	Arbitration
Mediation	Expert Determination
	Litigation
	Negotiation

Figure 10 - Proposed Taxonomy of ADR Techniques (Fenn et al., 1997).

These notions are useful in the sense that they present an organized view of the different steps involved in ADR and the various alternatives available. However, there is a different approach that will prove to be eloquent in explaining the steps to follow.

Six-step DRL: The stepped process of dispute resolution

This second categorization of DART uses six distinct stages in the evolution of construction disputes. The stepped approach proposed by Findley (1997) is shown graphically in Figure 11.

This theory recognizes conflict as an inherent part of construction projects. Based on that, it proposes early mechanisms to prevent the escalation to a dispute. The underlying idea is that the lower stages will facilitate the achievement of mutually beneficial solutions, for as disagreements climb the stepladder; parties start to lose control over the eventual outcome.

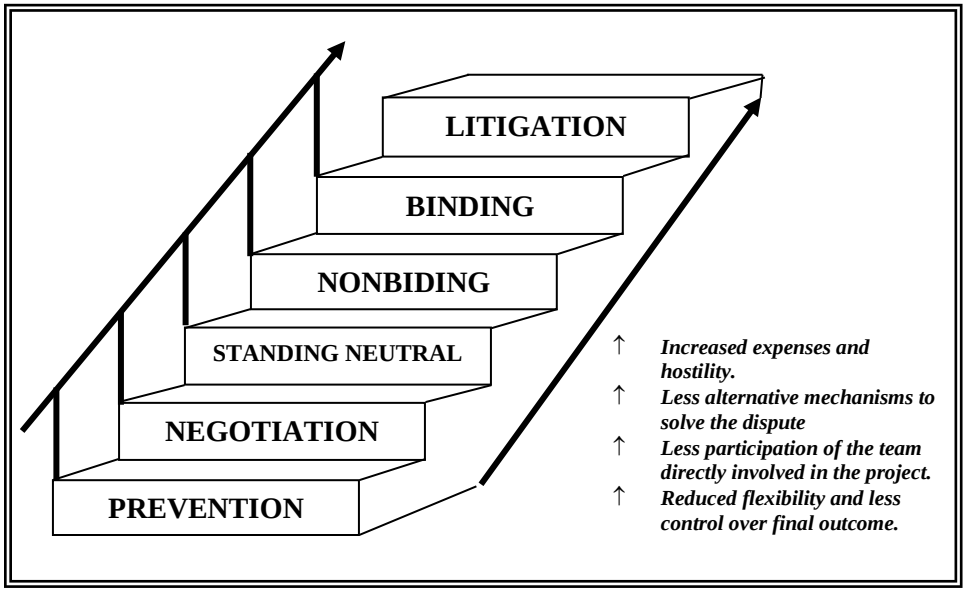

Figure 11 – Dispute Resolution Ladder (Findley, 1997)

Usually, at the middle stages, (Standing Neutral and Non-Binding) third parties are brought into the process and claims begin to depart from the job site level. The goal of external participants is to help disagreements return to a lower stage in the ladder, by identifying the real issues in dispute, finding a common ground between parties, helping in the analysis of technical problems, and/or assisting parties improve communication. Finally, as the parties get to the upper stages (i.e., binding and litigation), there is decreased participation of those who are really involved in the project, and it becomes less likely to invent alternative mechanisms to amicably solve the dispute, and the process starts to see a dramatic increase in costs and hostility.

The six-step DRL is flexible enough that it allows the development of project-specific DRL, something found in the two contracts of the FIDIC and the World Bank, where the escalation did not include all the steps and allowed the parties to attempt an ADR solution. The literature review also finds international applications of DART, with interesting variations depending on culture.

An example of the diversities in DRL is provided by the Canadian Construction Document Committee contract of 1994 (CCDC 2); a standard form of fixed-price terms and conditions designed for projects with three basic participants: the owner, the design or engineering consultant, and the contractor (i.e., Design-Bid-Build). The CCDC 2 provides a clear application of the modern DRL, recognizing some of the stages of the process and highlighting the benefits and challenges of each one (Figure 12). In terms of dispute resolution, the CCDC 2 contains specific provisions that make DART an integral part of the contract.

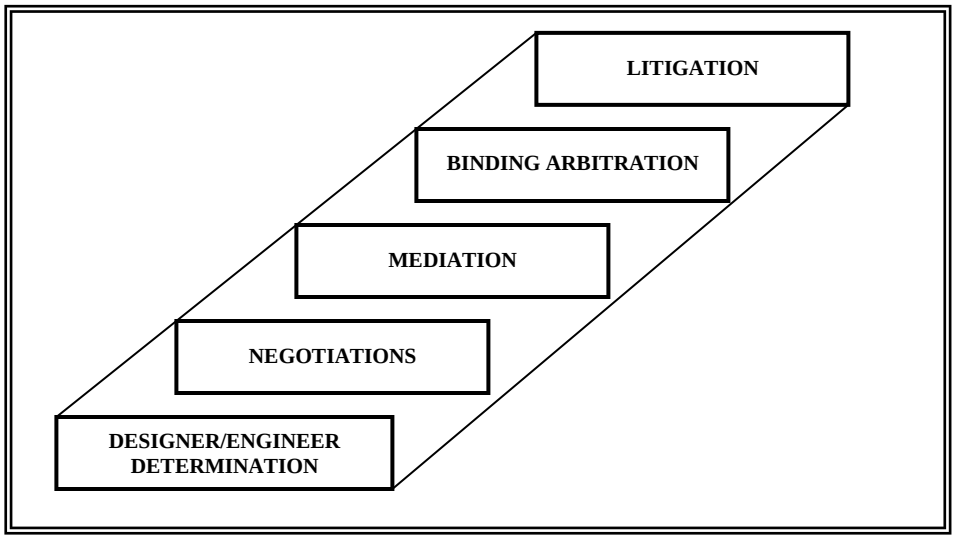

Figure 12 - Dispute Resolution "Ladder" established in the CCDC 2 Contract

According to the CCDC 2 contract, disputes arising from interpretations of the documents or from the execution of the works are to be referred for determination to the design professional (consultant). The consultant then has a limited period of time to issue a resolution regarding the dispute or disagreement. Negotiations between the disputants are mandated if the decision of the designer/engineer is not acceptable to either party. As part of this stage, the CCDC 2 requires the parties to *"...provide, without prejudice, disclosure of relevant facts, information and documents to facilitate the negotiations"* (Bristow, 1998), delineating the requirement for "Honest" negotiations as discussed in Chapter 5.

As the CCDC 2 escalates, when negotiations fail to provide a settlement within 10 days after they are formally initiated, either party must request the presence of the Mediator. Mediation is a mandatory step before any other binding approach can be initiated, and the parties must mutually select and appoint a mediator within 30 days after the contract is awarded. Disputes must be resolved 10 working days after the mediator is brought. The procedures can be extended by mutual agreement if the parties consider that progress is being made through mediation. If the parties fail to mediate a solution, they can request a confidential written opinion from the mediator, similar to a conciliation report.

This contract form is an important example of the use of different ADR mechanisms to develop a Dispute Resolution Ladder tailored to the job requirements and assists the disputing parties *"reach a joint resolution of their dispute during the course of construction so that the valuable business relationships can be preserved"* (Groton, 1997). The CCDC 2 offers a lot of flexibility to the parties during the first three steps of the ladder, but then sets strict time limits to encourage the parties to address the disputes and approach a resolution. As the disputes moves up the ladder, the CCDC 2 becomes less flexible and the rules governing the procedures are *"explicit and far more comprehensive"* (Bristow, 1998).

2.4 THE STATE OF THE LEGAL CONSTRUCTION ARENA

In a report entitled "Access to Justice," Lord Woolf (1996) concluded that the judicial system in the United Kingdom had reached a level of over-saturation. He called for a significant change in the litigation culture that dominates the legal scene in that country. Woolf summarized the problems of the British judicial system as follows:

- *"It is too expensive, in that costs often exceed the value of the claim.*
- *It is too slow.*
- *There is a lack of equality between the powerful wealthy litigant and the under-resourced litigant.*
- *It is difficult to forecast both the cost and the length of litigation.*
- *It is incomprehensible to many litigants.*
- *It is too adversarial, and cases tend to be run by the parties with the rules of court often ignored."* (Woolf, 1996)

These problems associated to costs, delays, uncertainty of outcome, complicated rules, and lack of control over the process are affecting the way different industries are dealing and solving their disputes without turning to the judicial system. In the specific field of construction, Gould et al. (1998) have identified three factors that have influenced the traditional dispute resolution procedures of this industry in the UK, moving it away from litigation:

1) General dissatisfaction with arbitration.
2) An increase in the number of conflicts and disputes within the construction industry.
3) International influence reflected in the worldwide movement towards alternative dispute resolution methods.

These challenges faced by the construction industry of the UK have been equally found as challenges in the United States. In a 1998 speech on the future of the construction industry, Henry Michel, chairman emeritus of Parsons Brinckerhoff Inc., described the current state of the American building industry as follows (Michel, 1995):

> *"We are members of the largest productive industry in this country and in the world, and we are members of an ailing industry, a troubled industry. Consider the following:*
>
> - *The construction industry's share of the gross domestic product [in the US] has declined 20% in the past 20 years.*
> - *Construction costs [in the US] have increased 60% more than inflation in the past 10 years.*
> - *We account [in the US] for 26% of the nation's fatal accidents.*
> - *Litigation expenditures [in the US] are increasing at 10% per year [for the past ten yeas]."*[8]

Productivity, innovation, cost savings, safety, and litigation expenses are critical areas for the future of the construction industry. It is in these areas that the industry must invest the most to advance successfully into the next century[9]. In the United States alone, $60 billion are spent every year on lawsuits, of which the construction industry accounts for nearly $5 billion. Michel points out that for every $1 billion saved on litigation in construction the industry could generate 40,000 new jobs, with the direct benefit of reducing legal expenses for all parties.

The fact that litigation expenditures continue to increase year after year is astounding. This book aims at providing information to the reader on ways in which these expenses could be reduced. The problem of excessive litigation costs is reiterated in a paper written by Bristow (1998), where an estimate of the legal costs associated with a hypothetical lawsuit between a contractor and an owner are calculated and compared to the initial claim amount. They included in their cost analysis, three basic items based on the Canadian legal system: lawyer's fees, trial costs (i.e., filing fees and expert witnesses),

and opportunity costs (i.e., time spent by key personnel in the litigation process). The results of these calculations show that the cost of the procedure for the contractor surpasses by almost 100% the original amount being claimed. The authors conclude that the industry is "*…being hampered by the tremendous amount of resources being utilized in the litigation of claims.*"

This exercise shows how the judicial system is no longer the most suitable and cost effective way to resolve construction disputes. Fueled by this reality, together with the fact that projects have become more complex and competition has increased, the construction industry has been forced to develop and experiment with alternatives to litigation in order to find cheaper and more effective ways to solve disputes. Thus, new approaches have been designed to overcome the rigid and adversarial attitudes and contract forms normally used in construction. These evolved to prevent the development of conflicts during the execution of the project, and to help companies forge longer lasting relationships with clients, designers, as well as subcontractors, while still solving their disagreements. These new and innovative approaches and techniques are known as Dispute Avoidance and Resolution Techniques (DART).[10]

The changes in the construction industry are going beyond the application of an alternative technique to court litigation (i.e., Mini-Trial or Arbitration). While the 80's saw the construction industry *"...turned on itself* – [as] *each part of the construction "team" started indulging in a seemingly unending orgy of risk-shifting, finger pointing, and costly litigation"* (ENR, 7/11/1994), the 1990s saw a revolution in the field of construction dispute resolution, as the construction "team" has understood the negative long-term effects of the approaches of the past decade. The team approach is being redesigned, going from an adversarial system towards a collaborative environment in which the limits are defined, but communication flows without unnecessary barriers. Many project teams have developed radically new philosophies towards achieving the project goals such as Partnering, Total Quality Management, and Risk Sharing. Some industry experts claim that the industry is going back to the *"old fashion way of doing business"*; when quality, service, and collaboration among parties were the norm, and disagreements *"...were settled on the jobsite at an informal meeting between the resident engineer and the contractor on the basis of a handshake."* (Treacy, 1995).

In the international arena, the need to improve communication and limit the chances of litigation is more evident. Large engineering endeavors are bringing together companies with diverse cultural backgrounds, legal systems, labor laws, objectives, interests, contractual agreements, competitive conditions, and priorities. Complicated communication arrangements, changing conditions, and varying requirements are now part of most large jobs. Therefore, in order to avoid having this diversity result in disagreements, channels of communication must be developed, and a collaborative environment for exchanges of information implemented.

The construction industry is suffering from an acute disposition to conflict and litigation. Many contractors even take the strategy of bidding low and hope to make up their losses in claims. This strategy makes disputes appear inevitable. Litigation expenses have become a significant cost item for many projects, affecting productivity and damaging business relationships. Professor Justin Sweet, of the University of California at Berkeley, summarized this situation by saying:

> *"... a dispute-prone process such as construction will have the propensity to call on the legal system to enforce contracts or obtain compensation for losses. Participants ... must do all they can to avoid disputes, to seek to settle those that do develop, and to be aware of the role law plays in the process." (Sweet, 1994)*

Based on this reality the construction industry has developed, during the past fifteen years, a number of different mechanisms and methodologies to prevent, manage, and

resolve disputes without recurring to litigation. Furthermore, parties involved in construction are continually experimenting with new ones to further mitigate the losses implied in legal battles.

2.5 SUMMARY

Conflicts have existed as long as human beings have interacted with each other. Consequently, for centuries, civilizations have struggled to develop different ways to manage and resolve disputes among its members and with other cultures. For some, conflict resolution meant the difference between peace and war, for others mediation and conciliation have simply become a way of living. A common feature in these approaches to dispute resolution has been a tendency towards a dichotic and polarized way of understanding the possible outcomes. The two alternatives have been an amicable settlement or an openly adversarial approach that usually ended the relationship among parties.

From the formalization of ancestral forms of dispute resolution, evolved the traditional two-step resolution ladder, where determination by the design professional and binding arbitration are the two poles of the model. However, as construction projects became larger, multi-cultural, and more complex, the two-step Dispute Resolution Ladder (DRL) has become a limited tool. The traditional model is often unable to meet the needs of the project participants in an effective, timely and cost-efficient manner, without necessarily jeopardizing the relationship between the parties involved.

Stemming from the limitations of the traditional two-step model, new approaches have emerged trying to introduce alternative techniques to be used throughout the process of conflict management. First, this chapter reviewed Fenn *et al.*'s 'conflict continuum' and the way it served as a useful tool to divide multiple binding and non-binding strategies across this spectrum. Second, the Dispute Resolution Ladder proposed by Findley (1997) was chosen as the guide for the chapters to follow. The selection of this model to organize the dispute avoidance and resolution techniques found by this book was based on two characteristics of this model. First, this model has the advantage of lending itself to practical applications, as clearly shown in the CCDC 2 contract. Second, the DRL emphasizes the important role of prevention techniques in dispute resolution process for construction projects. This prevention stage in the DRL is the focus of Chapter 3, where a series of techniques designed to mitigate some of the common sources of disputes discussed in this chapter are introduced together with some examples of their implementations.

2.6 POINTS FOR DISCUSSION

2.1 The construction industry has been labeled as "inherently inefficient." What are the reasons for this statement? How does this relate to conflicts, disputes and claims in the industry?

2.2 The original two-step process (Section 2.1) assumes that the project is delivered under the traditional design-bid-build procurement model. How would this change for other delivery systems such as design-build, design-build-operate-transfer and turnkey?

2.3 Old England and Confucian Philosophy (Section 2.1.2) incorporate the premise that conflict was frowned upon in society. In England, if a party violated a non-binding decision, the violator was publicly shunned. In China, if a conflict went to litigation

it implies a “loss of face.” How much influence does a contractor’s reputation have in today’s society? How does this perception vary from private and public owners? What about the owner’s reputation?

2.4 What role should professional organizations play in developing DART?

2.5 What role should large bureaucratic owners such as the World Bank (Section 2.2.2), the Hong Kong government (Section 2.2.3), or the US Federal government play in developing DART?

2.6 In the United States, conflicts arise in bidding situations when there is not transparency in the bidding process. Can frame contracts, as described in Section 3.4.5, be effectively used in government procurements and still be fair? On what basis should you select the contractor if a price is not predetermined, according to the frame contracts? Are there other ways to incorporate objective alignment other than frame contracts?

2.7 The revision of the Red Book (Section 2.2.1) aimed at addressing claims earlier in the construction process. What are some advantages/disadvantages of addressing conflicts during the process and after the process?

2.8 How important is it for the mediators/arbitrators/judges to have an engineering/construction background? Can a reasonable and fair judgment be reached if they do not have this technical expertise? How much credibility will their decision carry?

2.9 Findley (1997) breaks down the DRL into six steps (Section 2.3.2). Does this extension from the two-step DRL draw out the process or does it increase the efficiency of handling claims? At what point are there too many steps in the DRL?

2.10 What are the differences between the CCDC 2 Contract DRL and the DRL in Figure 11 adopted from Findley, 1997 (Section 2.3.2)?

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2.8 ENDNOTES

[1] Solon's legacy is the codification of the laws that defined Athens's democratic assembly (King *et al*., 1994).
[2] The term "loveday" *was used "…because the Quiet and Tranquility that should follow the ending of the controversy"* (Hurt, 1995).
[3] Apparently, this has been the general thought among drafters of contracts and construction law, since in every country reviewed as part of this book, arbitration was found to be the standard for construction dispute resolution. In a number of these countries, the arbitral proceeding was found to be contingent upon the completion of the project.
[4] Requiring a report from the mediator is a departure from the neutral facilitator role normally assigned to this person. The fact that this project was very much under public scrutiny might be the reason for wanting to have a written document explaining the recommendations of the mediator.
[5] The recent American Arbitration Association has incorporated this feature to the new construction rules (See Section 8.3).
[6] This program includes mediation before a trial date can be scheduled.
[7] This problem of qualifications of the third party has been addressed in the 1996 revision of the American Arbitration Association of the Arbitration Rules for construction disputes.
[8] For example, from 1983 to 1990 the number of construction arbitration cases filed with the AAA grew from 2,675 to 5,440 (MacManamy, 1994), or approximately at an average 15% per year. From 1994 to 1996, the number of cases filed with the AAA grew at an average of 8% per year (Fenn et al., 1998).
[9] Thomas (1998) reports that litigation is discouraging engineering innovation and technological advancement in construction projects. Consulting engineering firms are unwilling to recommend creative designs "...out of fear of litigation-frenzied attorneys."
[10] For easier reading Dispute Avoidance and Resolution Techniques will be abbreviated as DART.

CHAPTER 3

STAGE 1: PREVENTION

"For every $1 you spend on claims management during the front-end of the project, you save at least $20 to $25 in claims during construction."
(Zack a, 1997)

A large nationally based contractor teamed with a local, well-respected concrete contractor to form a joint venture to construct a US$ 100 million office structure uniquely designed. This project was designed and built on a fast track basis. The owner selected the contractor though a round of negations. At 80 % design, the owner and the contractor negotiated a guaranteed maximum price (GMP) of US$100 million. It was imperative that the contractor finish on time. The owner was in the process of moving, and the current office the owner occupied had already been sold and a departure date set.

With the GMP set with only 80% of the design being complete, the contractor understood that there would be changes. As the job was underway, they were designing the upper superstructure while garage construction was underway. Further complicating things, the owner added a second architect while the steel was going up to handle only the interior design. From experience, the owner was aware that large, fast track, multi-party projects are conflict prone environments. Misunderstandings, incompatible objectives, change, incomplete scope definition, performance and disruption were all encountered on this

CHAPTER LOOK AHEAD

WHAT IS IT? Preventing conflict before it happens. It presents techniques that focus on minimizing the sources of conflict presented in this chapter. These techniques include risk sharing, escrow bid documents, innovated project award and delivery systems, incentive programs, importance of constructability analysis and documentation, cost/schedule controls, and contract implementation.

WHO IS INVOLVED? The owner is the most crucial participant in this stage. Decisions are made on how the project should proceed before other participants are on board. The contractor's staff will also benefit from this information, especially the documentation, cost and schedule control and training sections. The A/E should also be involved as a solid, well-reviewed design reduces conflict exponentially.

WHY IS IT IMPORTANT? The preventative stage is the most effective stage to resolve disputes. Although the cost of implementing these techniques in this stage is sometimes viewed as additional costs, the benefits usually far exceed the costs. Avoiding disputes before they start is always the best option.

HOW TO APPROACH IT? Review the sources of conflict in the construction industry. Keep an open mind in applying new techniques to avoid conflict. Apply when designing the Conflict Mitigation Plan.

KEY CONCEPTS

project.

Realizing that these conflicts are going to occur is an important step in preparing a conflict management strategy. After the realization that conflict will occur, the next step is deciding how to prevent them. This case raises several questions. What effect does the GMP have on the number of conflicts that may surface on the project? Is this the appropriate delivery system? With numerous parties involved, how might they keep misunderstandings at a minimum? How should the project risks be allotted?

3.1 IMPORTANCE OF PREVENTION STAGE

The prevention stage offers the greatest flexibility to design and create innovative ways to improve communication and job performance by minimizing disagreements and helping the project team resolve those problems that arise before they become disputes or claims. The flexibility of this stage comes from the fact that the construction has not actually begun at this time; hence, as Smith (1995) states, *"...this is the only time the owner has unilateral control over how to work with someone."* After the contract is awarded and signed, the owner will have at least one partner in every decision, change, or interpretation regarding the project (i.e., architect/engineer and/or contractor). Prevention of disputes begins with a good design, comprehensive specifications, complete contract documents, risk assessment, and other features of job organization. It includes tight and consistent management of architectural design and engineering, risk sharing, incentive programs, cost and schedule control, peer review, value engineering, and constructability reviews.

This initial stage in the Dispute Resolution Ladder (DRL) offers a vast array of techniques to promote dispute avoidance and encourage conflict resolution during construction. The role of the owners are significant in this stage, since they have the responsibility for the creation and introduction of a DRL that best fit the characteristics, risks and conditions of the project. The owners must accept the fact that disagreements will occur, and they must incorporate mechanisms in the contract to resolve them as quickly and efficiently as possible as part of the Prevention Stage.

In terms of cost, some of the techniques in this stage represent additional expenses for the owner and/or contractor. Most of them are based on existing practices that are upgraded and adjusted to enhance the interaction between the team members (i.e., people issues) and the exchange of project information (i.e., communication) through collaboration, joint development, and updated project data. The use of dispute prevention techniques will *"...yield the harmony with the least cost,"* Findley (1997). As an example, a representative of a major US Public Works owner had this to say about the costs and benefits of prevention techniques in his projects (Zack a, 1997):

> *"For every $1 you spend on claims management during the front-end of the project, you save at least $20 to $25 in claims during construction."*

Consider that fifty percent of all construction claims submitted to the American Arbitration Association (AAA) for resolution, fall under the US$50,000 value (Stipanowich, 1997). It follows from the statement above that on average an owner should spend $2,000 on prevention per dispute; a rather small amount compared to the expenses required to achieve any type of resolution through binding procedures (i.e., arbitration). Therefore, the potential savings that can result from prevention measures should encourage the complete building team (i.e., owner, designer, and contractor) to incorporate them into the project.

This chapter presents twenty-three specific techniques to help prevent disputes in projects. They have been organized based on the underlying principles that allow us to consider them capable of preventing construction disputes.

3.2 EQUITABLE RISK SHARING

Unloading all of the construction risks on the contractor is an accepted trend in construction contracts, *"...but also as a practice that is not cost effective"* (Findley, 1997). Research by the Center for Public Resources (CPR) in New York, has found that *"...many disputes arise when parties are forced to contest the adverse impacts of an unreasonably allocated risk."* As contracts continually force contractors to assume risks that are beyond their control, *"...contractors have turned to litigation as a way to resolve this inequality in the long term."* (Vorster, 1993)

In a recent study conducted on project risks, 85 construction contractors in Hong Kong ranked how different project risks contributed to project delays. The results (starting with the risk contributing to the largest delays) were as follows: (Shen, 1997)

1) Insufficient or incorrect design information,
2) Variations in ground and weather conditions,
3) Subcontractors' manpower shortage,
4) Shortage of materials/plant resources,
5) Poor coordination with subcontractors,
6) Poor accuracy of project program,
7) Shortage of skills/techniques, and
8) Abortive works due to poor workmanship

As shown above, the study found that contractors included in the top-three contributors of delays (i.e., possible sources of disputes), four conditions that fall beyond their initial control: design problems, site conditions, weather, labor shortages and scarcity of material. So, it is not surprising that change order requests relating to these four conditions are among the most common causes of delays in construction. As presented in Section 1.3, this book has identified that project uncertainty in the form of unexpected sub-surface conditions, variations, changes in design, unrealistic expectations, and weather, to name a few, are among the primary sources of disputes in construction projects. This project uncertainty is translated into the risks each party has to assume, either by choice or by contract, upon becoming a project team member.

In a paper on risk allocation in large infrastructure projects, it was concluded that:

> *"The general guiding principle of risk allocation should be that the different parties involved should seek a multi-beneficial distribution of risk. A dominant party that off-loads all project risks onto others is unlikely to enhance the chances for a successful outcome."*
>
> Vega (1997)

He further points out that a successful risk allocation is based on having the basic concessions and project agreements right and understood by everyone; moreover, it is based on clearly defined DART system (i.e., DRL) from the start (Vega, 1997).

By distributing the construction risks among the parties in a more balanced manner, owners, designers, and contractors can manage the uncertainties more efficiently. As more team members, with greater overall knowledge and experience, share project risks, contingency costs carried by each party to cover them can be lowered. A project where

risks are distributed more justly also sets the stage for greater communication and interaction among the parties, resulting in more honest and productive negotiations when unforeseen conditions become apparent. An example of the concept of *Shared-Risks* between the owner and the contractor in a construction contract is summarized in Table 7.

Table 7 – Allocation of Project Risks under the Shared-Risk Approach (Findley, 1997)

ITEM	RISKS	OWNER'S		CONTRACTOR'S	
		Risk	Reason	Risk	Reason
PREREQUISITE RISKS					
1	Adequacy of Project Financing	X	Owner's project		
2	Adequacy of Labor			X	Can best assess requirements
3	Permits and Licenses	X	Shared	X	Shared
4	Site access	X	Owner's site		
PERFORMANCE-RELATED RISKS					
1	Sufficiency of plans	X	Sets up the Bidding process		
2	Underestimation of Costs			X	Estimate the contract
3	Owner furnished material	X	Owner's choice		
4	Contractor Furnished material			X	Responsibility identified in contract
5	Means and methods of construction			X	Area of expertise
6	Delay in presenting problems	X	Could be the claiming party	X	Could be the claiming party
7	Delay in addressing and solving problems	X	Party receiving the claim	X	Party receiving the claim
8	Subsurface conditions	X	Owns the site		
9	Worker and Site Safety			X	Controls the execution
EXTERNAL EVENTS RISKS					
1	Governmental Acts	X	Shared – not predictable	X	Shared – not predictable
2	Abnormal Adverse Weather	X	Shared – not predictable	X	Shared – not predictable
3	Acts of God	X	Shared – not predictable	X	Shared – not predictable
4	Cost escalation	X	Shared – not predictable	X	Shared – not predictable

In this table, both parties share external events, which are usually the ones with the greatest uncertainty, as they are not predictable. Contractors share risks that were usually

assigned to them exclusively, such as abnormal Adverse Weather conditions, but they now also share the risks associated with Acts of Gods, easing some the owner's burden. This type of distribution of risks meets Vega's (1997) requirement that uncertainty must be allocated seeking the benefit of all parties and not just an unfair allocation to limit individual liabilities.

Considering the necessity to improve the distribution of risks in construction projects to mitigate conflict, the following three contract clauses and methodologies have been developed.

3.2.1 ECONOMIC PRICE ADJUSTMENT

A clause that allows for controlled price escalation during the life of the project can help reduce the amount of 'guesswork' performed by the contractor when pricing the job. When contractors are forced in fixed cost contracts to assume 100% of the cost escalation risk, the owner can be setting the stage for future disputes. In highly competitive markets, when contractors are pressed to offer savings to their clients, contingency amounts are usually the first ones to be taken out during contract negotiations. When price escalation begins to affect the contractors' bottom line, claims tend to follow.

Zack (a, 1997) suggests that on projects over 3 years long or located in countries with unstable economies, owners should provide in the contract methods to evaluate and determine price escalation. By doing so, owners reduce uncertainties and limit the contractor's liabilities for price adjustment. The contract might set a limit to the price escalation to be carried by the contractor, leaving anything above that number to the owner. If significant increases in costs occur during the life of the project, the contract already has a formula and the conditions to compensate the contractor, eliminating the need for a claim. An agreement, prior to the existence of open conflict, on the level of risk each party will assume and the mechanisms to apply if an unexpected price escalation occurs, will significantly expedite the reviews and approvals, while reducing costs and time implications.

An example of this occurred for the installation and maintenance of all the moving walkways and escalators in a major airport. The cost of hiring mechanics that perform this specialized work tends to fluctuate. Since the maintenance contract was for seven years, the owner included a bid item to account for this fluctuation. This bid item was tied to industry wage averages in this field. The result, the owner received six competitive bids and the contracts had insurance that they if the cost of this labor increased, they would be compensated for it.

3.2.2 GEOTECHNICAL BASELINE REPORT (GBR)

Although research has found that unforeseen ground conditions are a primary source of delays in construction projects, most owners only address this issue by transferring this risk to the contractor. The Geotechnical report is provided to the bidders "for information only" with a disclaimer to the effect that contractors may use that information but are completely responsible for any interpretations of the data. On the other hand, most contractors can not afford to make their own soil borings, nor can they hire a Geotechnical consultant during bidding, so they end up relying solely on the information provided by the owner. When unforeseen soil conditions are found, disagreements and claims are common, as contractors will attempt to shift this risk back to the owner. Because this type of dispute tends to happen at the beginning of the job, they usually have a significant effect on the overall performance of the project, interfering with many future disagreements and negotiations on other issues.

Geotechnical Baseline Reports (GBR) provide for a new way to present sub-surface soil conditions and to distribute the associated risk. This Geotechnical report has an additional section that includes not only an interpretation of the soil borings and test results but also an outline of the possible subsurface conditions the contractor should expect to find. This information is developed by the owner's consultants and paid for by the owner. With this information, the owner can require the contractor to include provisions to deal with any of the possible conditions outlined in the GBR, effectively limiting his risks to anything beyond those provisions. On the other hand, the contractor's uncertainty concerning the sub-surface conditions has now been limited to a set of defined possibilities. The contractor is free to decide how to estimate and price the work more efficiently, confining the risks to decisions within his control.

By making this additional information available to the contractors, the owner improves their chances of getting a more competitive bid, and they establish a baseline to evaluate and measure future claims on differing site conditions. By sharing the sub-surface risks with the contractor, the owner reduces the likelihood of disputes on this issue, while at the same time, it gives the contractor a tool to improve the assessment of the project costs, schedule, and uncertainties.

Toronto Transit Commission (TTC) Case

The following case confirms the advantages that a balanced allocation of risks had in a Canadian construction project, the construction of the Sheppard Subway twin tunnels in Toronto. As reported by Skelhorn (1998), the Toronto Transit Commission (TTC), the owner, has been successful in the implementation of the following DART:

1) Risk sharing for cost reductions and schedule acceleration:
    a. The TTC bought and supplied the Tunnel Boring Machines (TBM), removing the uncertainty about the type of equipment needed in the contractors' proposals. However, the TTC assigned the maintenance responsibility and the operation of the machines to the contractor, and included in the agreement with the TBM supplier a regular service and supervision contract. In addition, the contractor was made responsible for supplying the head dressings for the TBMs. Through the first 3.3 km. of tunnels; the "mechanical availability" of both machines had exceeded 90%.
    b. The tunnel precast concrete liners were bought and supplied by the TTC to the contractor for installation. Although no additional information on the reason for this purchase was provided, based on the type of project and the other DART implemented by the TTC, it can be inferred that this purchase limited the contractors risk as to this large purchase of material, and allowed the owner more direct control over the detailing and fabrication of the precast liners.
    c. A Geotechnical Baseline Report was supplied to all the parties performing design and/or work for the TTC, and so far the performance of the TBMs has been as expected, as well as the wear of the head dressings supplied by the contractor.
    d. The TTC assumed the responsibility for surface conditions monitoring, construction insurance, and quality control. However, the TTC made everyone a stakeholder and linked the sensors on the TBMs to the offices of the engineers, the contractor and the TBM supplier, forcing everyone to focus on these critical aspects of the tunneling operation. This real-time data is reported as being a great benefit to all parties, since it provides immediate access to information on the machines for

"advisory and troubleshooting" purposes and for trend and scheduling analysis. This data system had allowed timely responses by the engineer-contractor team to settlement conditions, reducing the effects of ground settlements beyond the set limits to only a few "isolated incidents."

2) On-site partnering (see Chapter 4) with scheduled off-site retreats to promote communication and collaboration.

3) A Dispute Review Board (Section 6.3) to hear and resolve disagreements and conflicts during construction effectively and efficiently, and to assess and provide an opinion on potential areas of dispute.

As a result of the application of the risk sharing techniques, coupled with partnering and the Dispute Review Board, the project was completed on schedule and the new subway line is scheduled to begin operations in 2002. The Dispute Review Board visits the site every quarter to receive an update on progress and offer advice on any potential disputes (similar to what happened in Hong Kong – Section 2.2.3). So far, the Board is yet to be asked formally to decide on any disputes. Disagreements are being addressed and resolved promptly by the site personnel through partnering, with some level of informal participation by the Dispute Review Board (Skelhorn 1998).

3.2.3 THIRD PARTY BENEFICIARY CLAUSE

Almost every construction project involves more than one contractor, and owners tend to become the only responsible party to a number of contracts with different entities. When one contractor causes delays, the owner usually becomes the defendant in more than one claim as other contractors, affected by the performance of this one party, move against the owner for relief. Single prime contracts can limit this situation from occurring, but as jobs have become more complex, it is impossible to award the total project to only one party.

In order to reduce this effect, Zack (a, 1997) recommends the use of a Third-Party Beneficiary Clause in construction contracts. With this clause, owners are able to share among all contractors and sub-contractors the risks of delays, by making each company the "intended third-party beneficiary" of all other contracts. Through this clause, owners can avoid claims that are not caused by them, and contractors can seek relief for delays caused by other parties directly. Another benefit of this arrangement is that relationships are less strained, as contractors are not fighting the owner over matters beyond his/her control, and they can still search for compensation from the third party at fault.

3.3 ESCROW BID DOCUMENTS

In this form of preventive DART, the project team (owner/contractor) submits to a third party neutral a full set of the documents used by the contractor to prepare the bid, including information regarding pricing, production rates, equipment selection, and any other aspect considered in finalizing the proposal. Confidential information such as mark-ups and fees is not included. The project team reviews the documents before placing them in custody, and agrees on both the procedures to access the information and how the costs of safekeeping the documents will be shared. These documents remain confidential under the escrow agreement, and parties can only access the information to resolve an issue in dispute. Changes to the contract can be added to the escrow documents once they are negotiated and signed by the parties, as well as any supplementary conditions that are agreed to after the award.

By “freezing” the original bid documents, the project team creates a valuable source of information to be accessed only when disagreements arise in issues such as productivity, design details, and equipment selection. The advantages of putting the bid documents in escrow are two-fold. First, it provides the basis for the review of any claim regarding how an item was bid, how a detail was interpreted, or what productivity factors were used. For example, if a change order requires additional excavation and disposal of excess soil, parties can access the escrow documents and review equipment productivity rates, and base costs for equipment rental and for disposal of excess material. Also, parties can review the original quantity take-off performed by the contractor to determine whether that specific excavation was considered or not in the original bid. Once this information is determined and agreed by the parties, the respective mark-ups and fees can be negotiated.

Second, the existence of this ‘as-bid’ database should deter any unfounded claims from the contractor, since the original documents will not support them. This mechanism can help prevent disputes and provide information to analyze disagreements faster, in accordance with a set of variables that can be reviewed by both parties.

3.4 PROJECT AWARD AND DELIVERY MECHANISM

Four forms of innovative project awards and delivery mechanisms are presented below, which recognize the possibility of disagreements in construction projects, and provide specific tools to manage and deal with some of them more efficiently. These methods are derived from the project structures previously mentioned in Section 1.2.2.

3.4.1 NEGOTIATED COMPRESSED PROCESS

In an effort to reduce the number of interpretations given to contract documents, which is a major source of dispute, a new bidding method has been developed for Earthwork and Tunneling jobs (Civil Engineering, 1995). Known as the Negotiated Compress Process, this bidding-selection system divides the contract award in three steps. First, the owner qualifies the contractors based on the type of work to be executed and their experiences. Second, the selected contractors meet with the owner and designers to decide jointly on the best type of equipment, a key variable in pricing earthwork and tunneling jobs, and any other issue which might be considered critical to the execution of the project. Finally, each contractor presents its bid, based on the agreed items, and the contract is awarded to the lowest bidder.

According to Zack (a, 1997), this three-step bidding system provides for a more balanced distribution of project risks since some of the uncertainty is reduced (i.e., the selection of the equipment). In addition, the fact that this is a joint decision allows for significant savings, during submittals and start-up, for all parties. Furthermore, it limits problems associated with equipment, productivity, and schedule sequence during construction. The costs associated with the pre-bid meetings are borne by the owner, who should benefit from time/cost savings resulting from this early elimination of certain project uncertainties.

3.4.2 A+B BIDDING

Another new approach towards contract award is based on the notion that in general, owners want to finish their projects at the earliest possible date. Some public owners in the United States are including in the bid package a line item referred to as “cost per

day." Contractors are asked to provide, together with the pricing of all line items, the schedule duration in days for the project (also known as time of performance). Then, to obtain the total project cost of each contractor, the owner adds the construction costs (A-term) and the number resulting from multiplying the "cost per day" of the owner by the duration submitted by each contractor (B-term). The award is based on the lowest total project cost.

This award mechanism provides two incentives for contractors that reduce the chances of problems and disputes during construction. First, contractors are forced to review the construction sequence in detail and present the shortest feasible construction schedule, with the aim of keeping the B-term as low as possible. Second, contractors are encouraged to finish within the time limit in order to realize the full amount of the bonus (B-term); therefore, they should work with the owner and the design professionals to resolve potential problems before they become disputes and delay the job. More than 100 projects have been bid and built in the US using this system, and all of them have been completed on schedule (Zack a, 1997).

3.4.3 PEpC DELIVERY SYSTEM

This innovative delivery system was developed, based on the Engineering-Procurement-Construction model, by the Construction Industry Institute (CII 130-1, 1998). It was designed as a response to the increasing role major suppliers of equipment and material are playing in the construction process. CII defined this delivery system as:

> *"PEpC (Procurement, Engineering, procurement, and Construction) is an innovative project delivery system which makes it possible to utilize key supplier expertise in all phases of the project life cycle by developing an advance procurement strategy and by actually reaching a full commercial and contractual agreement with suppliers of strategic procurement item and/or systems prior to the principal engineering activities" (CII 130-1, 1998)*

In other words, critical pieces of equipment and materials are negotiated and procured before the actual engineering takes place, based on basic conceptual designs and detailed performance requirements. With the suppliers on-board, the engineering process incorporates their input, special requirements, and experience into the design. Among the benefits this system brings to the construction process, CII highlights the following:

- Improved quality of the detail design.
- Improved system and facility performance.
- More equitable allocation of risk.
- Improved utilization of supplier core competencies.
- Reduction or elimination of redundant work.
- Reduced need for owners and contractors to maintain non-core competencies that are more effectively maintained and delivered by suppliers.

As reviewed in Chapter 2, these benefits address areas that have been found to be sources of conflict in the construction process (i.e., design quality, owner objectives, risk allocation, and cost efficiency). Therefore, by improving these areas, the PEpC delivery method can help prevent disputes from developing during the construction process, or at least it can reduce the levels of uncertainty and risk in projects with highly specialized equipment, systems, and/or technology.

3.4.4 "BRIDGING" THE DESIGN-BUILD GAP

The use of Design-Build as a delivery system in the construction industry has grown significantly as an owner-favored method, both in private and public sector projects. This system provides the owner with a single-source of project responsibility and a single-point of communication, so as to avoid the "finger-pointing" and "risk shifting" that often takes place in other construction approaches such as Design-Bid-Build. Design-Build projects are generally completed faster, usually with less administration costs for the owner.

However, Design-Build is not a cure for all project delivery difficulties. Appelbaum (1998) has identified the following problems with it:

- Loss of control over design by the owner, as they forfeit direct communication with the designer.
- Selection of the design firm based on price rather than on qualifications.
- Less competition in the selection and award phases, as the owner is required to compare *"...apples to oranges, to bananas in order to choose a contractor,"* since each of the proposals might be different as they represent an interpretation of what is sometimes very basic design and/or performance parameters.
- The final product is a mixture of owner-contractor objectives and interpretations, but might fail to meet the original project criteria.

In other words, by transferring the design to the contractor, the owner generates a "gap" between their objectives and the design process, which is responsible for the translation of those objectives into plans and specifications. The owner is often left to choose from three or more completely different proposals, none of which is one hundred percent satisfactory. To correct these problems in the Design-Build delivery system, Kluenker (1996) and Appelbaum (1998) propose the concept of "Bridging" to close the gap between the owner and the design process, without loosing the many advantages of the Design-Build system.

Bridging divides the Design-Build process into three phases (Kluenker, 1996). In the first phase, the owner retains a design consultant who is responsible for developing a conceptual design that satisfies the owner's basic project needs. During this critical stage, the owner has control over how his needs and objectives are translated into a very basic design. Then, competing contractors prepare proposals based on this conceptual design developed by the owner, complying with the specific requirements set forth in these documents. The problem of having to compare apples to oranges is reduced, and the selection can take into account, in addition to the price, the technical solutions proposed to meet the criteria. Since the information contained in the conceptual design is limited, the overall design responsibility remains with the design-builder.

In stage two, the design-build team completes the design and the drawings of the project, while the design consultant acts as the owner's representative, serving in a "pure agent capacity" (Appelbaum, 1998). The consultant reviews working drawings to confirm compliance with design requirements. There is no design responsibility overlap. In the third stage, the contractor builds the project and the bridging consultant inspects work-in-progress as the owner's construction representative.

This system should overcome the disadvantages of the Design-Build delivery system outlined above as follows:

- *Owner's loss of control over design*: With the "bridging" consultant owners have control of the portion of design that should be more important to them (i.e., schematic and conceptual design)

- *Owner's loss of communication with the design professional*: Through the design professional, owners maintain direct communication with the design process.
- *Designer selection based on price*: The "bridging" consultant can be selected taking into account his/her qualifications. The conceptual design will benefit from this, as the goals and objectives of the owner will be properly translated.
- *Limitation of bidding and price competition*: The existence of a conceptual design will foster proposals from contractors, which are easier to compare and select taking into account price as well as design, materials, and technical solutions.

In terms of cost, the introduction of the "bridging" consultant in the Design-Build equation should be close to zero (Appelbaum, 1998). First, the cost of design development should be offset by a lower design cost in the Design-Build proposal, as contractors will lower the design fee, now that they have a conceptual design to work from. Second, the cost of the on-site representation should be covered by less change orders and disagreements between the original design conditions developed, by the owner, and design and details of the contractor.

"Bridging" helps ensure that owners using the Design-Build method receive a project that meets their needs. This reduces the chances of job upsets, rework, and claims. Furthermore, "bridging" should also expedite the submittal and design approval, as the design-builder will have to perform less guesswork to interpret the project requirements.

3.4.5 FRAME CONTRACT DELIVERY SYSTEM IN THE NETHERLANDS

In order to design and build large-scale, time-consuming civil engineering projects, in the 1970's the government of the Netherlands developed a type of project delivery system that is still in use and is known as "Frame Contracts." Under this scheme, parties start with only a very broad definition of the works to be completed and accept to negotiate partial contracts as the design problems emerge and engineers and architects propose different solutions[1]. According to Goudsmit (1985)[2], *"...the philosophy of the frame contract is that whereas a procedure for the negotiation of a price must be incorporated in it, the real execution of the various stages of the works should only necessitate agreement on the specification of such works as well as on the time period within which such work should be completed."* In other words, parties agree on *how* they will negotiate a price for works that will be fully defined in the future, with only a specified maximum duration and some basic performance and quality criteria. The following example from Belgium should clarify this concept and the reasons behind its development and implementation.

> *"In 1975, the frame contract formula was selected by the Government [of Belgium] for study/design and execution of a seaward expansion of the outer port of Zeebrugge. The decision was influenced by the success on similar maritime projects in the Netherlands.*
>
> *Dutch experience has proved that it is almost impossible to formulate in advance a 'cut and dried' study for projects which extend far beyond the coastline ... It is also difficult to pre-determine the effects of such projects on the behavior of beaches and seabed.*
>
> *... the preparatory study was directed towards obtaining the fullest possible information about the known or assumed behavior of the sea and the seabed. But surprises always occur because not all of the sea's reactions can be predicted in advance,...This requires rapid adaptations of the design and*

execution plans during the construction period without incurring costly delays or protracted discussions on claims.

The frame contract, which defines general but strict rules and limits for quality control, timing and prices, makes constant consultation possible between the Government and contractors responsible for design. Accordingly, studies and construction plans can be either amended or even changed as and when the need arises during the course of the project to ensure the utmost efficiency and completion on schedule." (Ir R. Simoen, cited by Goudsmit, 1985).

Through the use of the Frame Contract parties in construction have been able to effectively introduce the concepts of objective alignment, risk allocation, trust, and long-term commitments to enhance efficiency and reduce conflict in large scale engineering projects. By understanding the difference between "static agreements" (like the sale of a house) and "relational contracts" such as construction projects (Overcash, 1998); and by following this advice to concentrate more on the dynamics of the process than on its fixed elements, the Frame Contract creates a resourceful environment to manage uncertainty while designing and building large-scale projects. The benefits of this approach are not limited to the cases in which environmental uncertainties create a time-related concern (a typical worry in Nordic countries concerning the sea). Rather, they simply facilitate the task of dealing with the unexpected by effectively acknowledging it as a natural part of construction.

Among the most common delivery systems for construction projects in the United States, Design-Build is the closest one to a Frame Contract. However, there are significant differences between the traditional Design-Build and the Frame Contract, with regards to key aspects of the contract and the criteria for the selection of the contractor. Table 8 summarizes these differences.

Table 8 - Differences between Frame and Traditional Design-Build Contracts

ASPECT OF THE CONTRACT	FRAME CONTRACT	TRADITIONAL DESIGN-BUILD CONTRACT
Contract Value	Only roughly defined. The owner usually has a rough estimate, but the design is not even schematic to allow for the development of a budget. Prices are negotiated as the design is completed and the work is ready to be executed.	The total value of the contract is known, at least in the form of a firm budget.
Schedule	Only certain key dates are specified, usually by stages. The contract will set a limit for the latest acceptable finish date. Beyond that, the schedule specifics are developed as the project is defined.	Usually the owner sets the maximum duration and some key milestones that must be met by the contractors. In the proposals, contractors include a schedule to perform each phase of the project.
Design Parameters	Only a broad definition of the problem exists, and a general description of the works to be performed is included in the contract.	The owner provides some form of schematic or conceptual design. The contractors include in their proposals their initial interpretation of those parameters.
Design Performance	Only a broad definition of how the works are to function and perform is included. Contractor know-how, new technologies, and design decisions will determine the final performance criteria for the project.	Specific owner requirements and performance criteria is detailed in the tender documents and therefore in the contract.
Terms and Conditions	Contract focuses on the relationship. Because there is little definition at the award stage, the contract sets limits that will help guide the relationship and the future definition of the project. Special emphasis is given to the procedure to negotiate a reasonable price for the works as the design develops.	Varies from contract to contract, but it is usually more formal.
Risk Allocation	A balance allocation of risk is incorporated in the contract in order to manage the high degree of uncertainty at the beginning of the project.	Varies from case to case, but one of the basic premises of design build contracts was that most of the risks were assumed by the contractor.

Table 8 - Differences between Frame and Traditional Design-Build Contracts (cont.)

ASPECT OF THE CONTRACT	FRAME CONTRACT	TRADITIONAL DESIGN-BUILD CONTRACT
Dispute Resolution Clauses	The contract clearly defines procedures to ensure that negotiations are completed and issues are resolved. Alternatives are given to avoid disruptions because of a failure to agree on a certain issue. Arbitration is the alternative of last resort.	Each owner will define the dispute resolution mechanism, but many fail to do so assuming that by awarding a Design Build contract all project risks have been assigned to the contractor and therefore problems will be solved within the contractors' scope of work.
Partial Contracts	As the project develops and parts of it are defined, the owner can negotiate and issue partial contracts to the Frame contractor. The owner can also incorporate new subcontractors if negotiations fail or certain technical expertise is required.	The Design Build contractor has control over 100% of the works under its scope of work. Some contracts might require subcontractor approval by the owner, but no separate partial contracts are issued as the design develops.
Selection Criteria	Trust, previous experience, quality of previous work, state of the art technology, financial stability, willingness to assume risk, and reliability.	Price, proposed solution, schedule, experience and *usually price again*.

What the table shows, is that more flexibility is granted to the parties under the Frame Contract, allowing them to tailor decision-making to the specific situations that emerge as the project progresses. In the description of the Frame Contract the reader will find words like rough, certain, broad, and general, which demonstrates its openness to change and constant adaptation.

3.5 INCENTIVE PROGRAMS

According to Findley (1997), "*Performance awards* [incentive programs] *strengthen the project team members' commitment to speed the project along.*" In addition, incentive programs aid in the process of aligning the contractors' motivation and performance with the owner's objectives. As identified in Section 1.1, failure to achieve some degree of objective alignment among the parties is one of the sources of conflict and dispute in the construction process; therefore, incentive programs that promote the development of common objectives for all the team members should help prevent and mitigate disputes in projects.

Incentive programs can *"...improve contractor performance by focusing efforts on areas important to the owner"* (Howard *et al.*, 1997). Nevertheless, in order to benefit from this greater alignment of objectives, the owner has to define attainable yet challenging goals for the construction team. More importantly, the owner must continually evaluate the performance of the contractor against the set goals, with the purpose of determining, first,

if the contractor has earned the incentive, and second, if the goals will be achieved based on the progress made up to that point.

Three incentive approaches that encourage the alignment of the objectives of the different parties and promote collaboration and cooperation during the execution of the project are presented below. The first two incentive programs were identified by the Construction Industry Institute (CII 114-1, 1998) during a recent study conducted by the organization. The third program comes from an article by Zack (a, 1997).

3.5.1 COST/SCHEDULE INCENTIVE MATRIX

In order to align owner and contractor objectives to improve timely completion of the project within the stipulated budget allocation, owners can develop an incentive program that rewards contractors when they meet cost and/or schedule goals. By addressing the problems of cost overruns and schedule slippage's through the incentive program the owner increases his/her control over two important sources of disputes in construction, and promotes a collaborative approach among the construction team. The owner profits from meeting his/her planned schedule/cost projections, while the contractor shares in part of the benefits. The following example shows a successful application of this type of incentive program.

Howard *et al.* (1997) report that for a project worth over $100 Million to replace a wastewater drainage system, the owner proposed the contractor a 15% share in the benefits to be obtained from an improvement in the contractor's performance. The owner developed a value matrix for: *"...cost underrun versus budget, dollar value for completion before schedule date, and reduced owner overhead relative to the original plan."*

As shown on Table 9, the contractor's objectives can be aligned with those of the owner in the categories defining the incentive. They represent for the contractor the only way to acquire additional income from the execution of this project.

Table 9 – Objective Alignment through Incentive Program

Owner Objectives (Categories)	***Contractor Objectives before Incentive Program***	***Contractor Objective after Incentive Program***
Complete the project under budget (COST)	Meet cost estimate, cash-flow requirements and projected fee.	Meet cash flow, fee and maximize cost savings.
Complete the project ahead of schedule (SCHEDULE)	Meet schedule datelines without additional costs.	Complete project ahead of schedule, even if it represents some additional costs, which would be offset by the bonus.
Reduce the owner overhead costs (OVERHEAD)	Not concerned as long as owner is able to respond technically and administratively to its demands.	Collaborate with owner in solving technical and administrative problems to reduce overhead.

According to Howard et al. (1997), in this instance the construction team was able to surpass the owner's cost and schedule goals, and the contractor earned an additional $3.5 Million as an incentive (3.5% of original contract amount).

3.5.2 SUBJECTIVE DETERMINATION OF FEE

In this example of an incentive program, the owner and the contractor agreed to have part of the fee contingent on periodic engineering and/or construction performance evaluations, executed by the owner. In a cost-plus-fee project, the contractor's fee was divided as follows: 15% of the fee was a fixed amount, 15% was based on actual man-hours in engineering activities, 35% was tied to performance in engineering, and the other 35% to performance in the construction phase (Howard *et al.*, 1997). Then, in order to process the request for payments for 70% of the fee, the owner completed quarterly subjective evaluations of the contractor's performance. A minimum score was set as a payment requirement, and the contractor was able to recuperate any loss income from previous months by exceeding a specified score with superior performance in the following periods. The project was completed ahead of time and under budget.

This incentive program provided benefits to both the owner and the contractor. The owner realized the project within the specified time and budget, while the contractor was paid the full amount of its fee; it was able to adjust and correct any problems during the execution thanks to the quarterly evaluations; it developed and maintained a good relationship with the client during and after the project; and it spent less resources (i.e., field and office overhead staff and equipment rental) by finishing ahead of schedule. Moreover, the owner and the contractor resolved all project disagreements at the site level, without the need for the intervention of any third party.

According to study by CII (114-1, 1998), subjective evaluations of project performance give the owner the ability to address areas that are not normally covered by the contracts. For example, CII suggests that the owner can include "*customer satisfaction feedback as part of the incentive*" package for the contractor. However, CII warns in the conclusions of this 1998 study, that teams need "*specific targets and milestones to aim at throughout the total duration of the project, and an incentive totally dependent on a subjective determination, will most likely result in failures.*"

3.5.3 SUPERIOR TIME-MANAGEMENT ALLOWANCE

In an attempt to reduce the duration of projects or at least increase the chances of finishing on-time, some public owners in the US have introduced in their construction contracts what is known as a Superior Time-Management Allowance incentive (Zack a, 1997). Under this system, contractors are offered a fixed bonus based on finishing the project before the scheduled completion date, say 30 days ahead of schedule. This amount is added to the contract price.

As the project proceeds, contractors can submit schedule changes and delay claims, but the bonus remains tied to the original early completion date. In other words, if the contractor submits a delay claim for a 30-day extension, the contractor would in effect give up on collecting the bonus allowance. The same thing will happen if the job is finished on or after the original completion date, regardless of any outstanding claims, or any final arbitration awards.

The advantage of this system is that it discourages contractors from submitting time extension claims. Contractors should be more willing to collaborate with the owner in the resolution of problems, without turning them into additional time requests, to achieve the

full bonus amount. This approach works in two ways, first, it is an incentive to finish on time, and second, it is a disincentive to submit delay claims.

3.6 COMPETENT ENGINEERING AND DOCUMENTATION

Poor contract documents, changes, and deficient design, are among the most common sources of disputes in the construction industry (i.e., project uncertainty and process problems). In fact, five out the seven papers presented in Section 1.1 (Table 1) found these characteristics to be sources of disagreements and disputes in the industry. Therefore, to reduce this type of uncertainty, owners should improve the documentation by setting higher standards for their engineers and design professionals. The project should benefit in the long run as fewer claims and erroneous interpretations will develop.

3.6.1 CONSTRUCTABILITY ANALYSIS

One way to reduce disagreements and disputes based on contract ambiguities is to carry out constructability analysis. This analysis, performed during the planning, design, and procurement phases, can mitigate problems and claims during construction. Moreover, it can identify errors, omissions, and impractical details, which would have been uncovered by the contractor or supplier, resulting in additional costs and delays for the project. In Section 4.4 the application of the concept of constructability analysis is provided when the example of Lean Construction is presented. In this case, the contractor assigns structural engineers to work with the design team in order to improve the construction details of the facility and helps expedite getting the structure off the ground.

3.7 COST AND SCHEDULE CONTROL

"*On time and within budget*" has to be one of the most common clichés in the construction industry. Owners, designers, consultants and contractors commonly see these two variables as the ultimate goals of the project. However, to control the costs and the schedule of a project remains one of the most difficult activities to accomplish in any construction project.

A dispute management technique used by the Public Sector in Italy, illustrates the notion of cost and schedule control in the European continent (Fenn *et al.*, 1998). This technique is based on the requirement for contractors to report with monthly invoices any claims regarding the performance of the works during that period (Figure 13). Every month, before payment is made by the agency, the on-site representative completes a report based on the works performed during that month. This report becomes the monthly progress certificate (SAL), and it is given to the contractor for review and approval. If the contractor does not report a claim that has become apparent in that period, the contractor loses its rights to further compensation. In every report, the contractor must report any new claims, as well as any outstanding ones from previous months.

This requirement forces the parties to acknowledge the existence of an outstanding issue every pay-period, and forces them to address the matter. It also encourages an evaluation by the parties as to whether the outstanding claim is affecting any additional parts of the project since it has not been settled.

To further track the development and control the resolution of disputes in Public Works in Italy, if a claim in the SAL report exceeds 10% of the contract value, the Italian law requires immediate action by the head public official responsible for the project. Within

90 days, the officer must review it with the contractor and submit a proposal for *'amicable settlement'*; then the parties have 60 days to negotiate a solution. If they fail to resolve the matter after the 60 days, either party may proceed with arbitration after final completion.

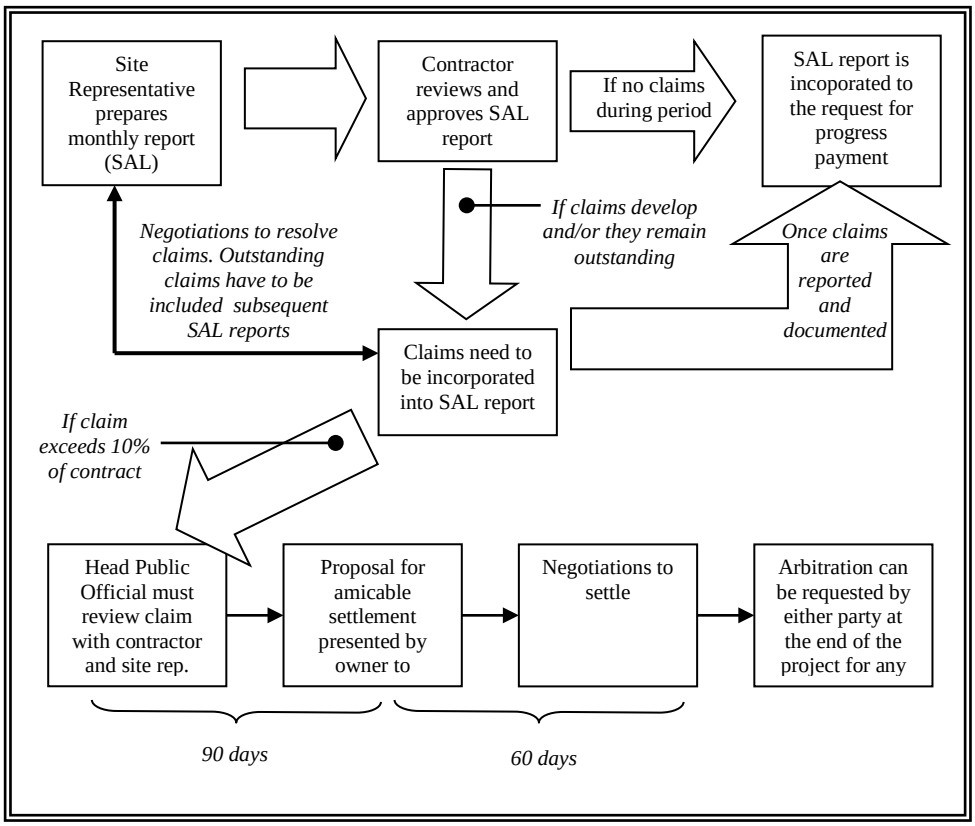

Figure 13 – Dispute Management Technique in Italian Public Sector Contracts

With these requirements, the Italian Public Sector has established a procedure and specific time periods for the negotiation of large claims. These claims will go through a process of Structured Negotiations (Section 5.6), before arbitration can be utilized to settle them. Moreover, by requiring that all claims be acknowledged and reported every pay-period, this owner is promoting that the on-site representative and the contractor meet and attempt to settle the claims to eliminate them from every SAL report (this type of incentive to negotiate disputes during construction is reviewed in Section 5.5 under Step Negotiations).

By assuming a pro-active approach like the Italian Public Sector, in the identification, management and negotiation of disputes (i.e., costs and schedule changes), owners have found ways to reduce litigation, encouraging the building team to attain the objectives outlined in the famous cliché. Projects that fall out of schedule and/or miss budget allocations are prone to disputes and confrontation. The following case provides a concrete and successful application of the concept of owner intervention as a strategy for dispute prevention in the Canadian construction industry.

Air Canada Center Case

As reported in Engineering News Record (ENR 2, 2/15/1999), $50 million worth of design and construction changes were introduced during the construction of the $265-million Air Canada Centre after the facility was 45% complete. These changes, however, did not disrupt the original construction schedule, and the facility was to open as planned. A change in ownership of the arena triggered the modifications in the project, and according to the construction manager, *"the changes were very, very difficult to implement because they were integrated throughout the entire building and affected the whole fabric."* (ENR 2, 2/15/1999). How come an increase of almost 20% in the amount of work did not affect the schedule? What was done to mitigate potential disputes and delays as the changes were implemented?

The key in the success of the implementation of these changes appears to be the new owner, who took an active role in the process. The goal was to make the changes without modifying the original completion date or *"going overboard on cost"* (ENR 2, 2/15/1999). Both the contractor and the designer participated with the owner in the definition of the changes and the procedure to implement them. The changes were not imposed on any team member. So, when the change orders were issued, there was already an agreement as to what and how they were going to be performed. Once the changes were approved, the contractor introduced a separate night-crew for three months to do the work, minimizing the impact on the rest of the construction.

By involving the complete project team in the decisions regarding the changes, the owner was able to introduce significant changes in a controlled matter. The costs were high, but the facility met the schedule deadline without any disputes as a result of the new work. According to one project manager, *"A big help was that once the owner charted a new course, it stood by its decision"* (ENR 2, 2/15/1999), encouraging every member to assume the new responsibilities and negotiating the changes as they were defined, not waiting until completion for a lengthy and troubled review. Although this was not a formally partnered project (Chapter 4), key aspects of this system were introduced through the involvement of the owner (i.e., team building, pro-active problem solving, effective resolution of technical, and financial issues).

The following sections present techniques that can help owners and contractors assume a pro-active approach as described in the Italian and Canadian examples above with regards to cost, schedule and claims control. These techniques highlight the advantage of establishing project information and guidelines to analyze and assign real costs to changes and, once again, the importance of owner participation in the management and control of the project's costs and schedule.

3.7.1 COST STATEMENT SUBMITTAL

In certain instances, owners have included as part of the contract a requirement that the contractor submits a certified statement of all costs incurred in the project, before the certificate of final completion is issued. With this information, the owner can evaluate any "after-completion" claims the contractor might submit after receiving the certificate and the retention moneys. More importantly, this requirement deters unfounded claims by the contractor once he/she is clear from delivering the project.

These after-completion claims can become very complicated as data is scarce and job-site people are no longer involved. Therefore, a certified cost report can provide important information for a more accurate review and faster negotiation of any final settlements.

3.7.2 CERTIFIED PAYROLL SUBMITTAL

Owners can use certified payroll submittals by their contractors for two very important aspects of the project. First, by keeping a record of actual labor expenses, owners will be better prepared to analyze and negotiate any claims where labor costs are an issue. Second, by tracking actual labor expenditures against a resource-loaded schedule, owners have an additional tool to assess progress and identify delays. With this information the owner can anticipate delays and approach the contractor with data he/she generated to negotiate a remedial action plan.

3.7.3 NEGOTIATED EQUIPMENT AND LABOR PRICING

Another way to gather information for faster dispute analysis and approval is for the owners to negotiate with the contractor's unit prices for equipment and labor before the contract is awarded. With this information, owners can issue change orders and request additional work while knowing the approximate cost implications of their decisions. Moreover, contractors should provide more "honestly priced" change requests, since the information has to be based on this schedule of values (Zack a, 1997).

In addition to equipment and labor prices, owners and contractors can agree on specific unit prices for work items that will be typical for the type of project. For example, in a renovation of an existing facility, both parties can agree on unit prices for items, such as demolition, paint, clean up, and disposal of construction debris. These prices can then be used as the project develops and unforeseen conditions require additional work.

Even though there are many nationally recognized equipment, labor, and work-item rate schedules for costing, each job can vary significantly from the assumed conditions of these sources of pricing information (Hoctor, 1989). Therefore, the parties should agree to this information before hand and include it as part of the contract.

With the rates for equipment, labor, materials, and work items agreed upon before-hand, parties can then concentrate on analyzing, for example, whether the crew-type or equipment used were the most appropriate, whether the time used to complete the work was not affected by other conditions, and whether the production rates used were reasonable. Hence, the surprise factor (i.e., uncertainty) associated with change orders that are priced after being executed can be eliminated.

3.7.4 JOINT PROJECT SCHEDULING

Zack (a, 1997) suggests that *"...success is more likely if people become stakeholders."* This is especially true for the project schedule, and *"...one way to see that all members of the project team become stakeholders in the schedule is to provide for joint project scheduling."*

Instead of having the contractor prepare and submit for approval the schedule, the owner, the contractor, the major subcontractors, and the suppliers participate jointly in the development of the baseline program for the project. This joint development eliminates any schedule games (i.e., hidden float, change of sequence, front-loading) and forces parties into communication and collaboration during the planning stages.

Once everyone agrees on the joint timetable, and the job begins, updates are prepared by all parties and will represent the consensus of everyone involved in the project. Delays can be identified and negotiated as parties complete the schedule updates jointly, since now they all have a 'stake' in what is presented to senior management. Schedule reviews and change order impacts are also performed together, thus reducing the chances of

future delay claims and disruption disputes by one of the parties. The following example clarifies the application of this technique and some of the benefits it can generate.

Nestle Chocolates Case

For the construction of an industrial plant in Cagua, Venezuela, the owner Nestle Chocolates, Switzerland, and the contractor retained a scheduling consultant to develop, update and control the schedule for the project[3]. With the help and input of the consultant, the parties generated a Master schedule that took into account both the critical dates of the owner and the resources allocated by the contractor for the construction. As the project began, each party assigned one engineer to follow the schedule, perform the biweekly updates with the consultant, and present the results in the project meetings. After two months into the job, a weekly joint scheduling meeting was organized to review those areas that were behind schedule and to jointly resolve the problems causing the delays. After each meeting, the consultant issued a report that presented the apparent reasons for the delays and identified the responsible party. Since the schedule had become a joint effort, these reports became a working tool for the team and helped solve a number of problems without any discussions about claims.

Although the project had significant problems with regards to costs escalation and design changes required by the home office of Nestle, the joint scheduling effort provided an efficient tool to mitigate some of the effects of these changes. Both parties worked together in analyzing each change and with the scheduling consultant determined the real effects they had on the overall Master schedule. The project was completed one year behind the original completion date, but no delay claims were filed at the end, since each change was evaluated jointly and incorporated into the schedule as it occurred. The consultant provided the necessary technical expertise, and gave the owner's team a sense of trust that allowed them to assume with the contractor the responsibility for the schedule. The costs of developing the Master schedule and running the biweekly updates were shared by both parties, even though in the tender documents, the contractor was responsible for this activity.

3.7.5 SCHEDULE AUDITS

Monthly schedule updates are a common requirement in construction contracts. The contractor presents, usually with the request for payment, a schedule update showing progress made on the project. Two problems, however, can result from this approach. First, the owner reviews schedule updates only once a month, so delays might be identified as much as a month after they had become apparent. Second, the schedule may become just another hurdle towards achieving payment, so it is assigned a secondary role in the management of the project.[4]

To avoid this, owners should first separate payment request, which can include an updated schedule, from the 'real' schedule updates and reviews. The owners should request weekly or biweekly schedule updates. Since most contractors generate not only weekly lists of the activities that should be accomplished the following week but also a list of the unfinished activities from the previous week, the requirement can be as simple as to demand a copy of this information, in order to avoid generating additional scheduling expenses for the contractor.

3.7.6 AS-BUILT SCHEDULE SUBMITTAL

Following the same logic as the Cost Statement Submittal (Section 3.7.1), owners can request an as-built schedule from the contractor before issuing the certificate of final

completion and releasing the retention. As with the certified cost report, the as-built schedule becomes the basis for review of any after-completion claims. By submitting a schedule that reflects the actual construction sequence and total duration, the contractors will be discouraged to submit, at a later date, delay claims that were not previously shown. If the contractor has plans to present any delay claims at the end of the project, they will have to address them in the as-built schedule, and they will be required to arrive at a settlement prior to receiving the final completion certificate.

3.7.7 FORWARD-PRICE CHANGE ORDERS

Impact or indirect costs like home office overhead, field staffing, or overtime work, that can be associated to change order work beyond hard costs (i.e., labor, equipment, and materials), have been identified as an additional source of disagreements in change order pricing. To improve negotiations and reduce the amount of disagreements, owners and contractors can agree beforehand on the guidelines and methods to determine and limit these impact costs. Zack (a, 1997) suggests that a set of impact factors can be developed for issues like *"timing of changes, number of trades involved, effect on the schedule, effect on office and field staffing, and the cumulative nature of the disruption."*

When change orders are priced and negotiated, owners and contractors will be able to incorporate in the total amount, both hard costs and impact costs, and they will be able to settle on a final adjustment to the contract value. Consequently, no further discussions or claims will be required after these negotiations because the changes will include everything (ENR, 9/11/1995). An example of a forward change order is presented in Chapter 5.

3.7.8 RIGHT OF REFUSAL ON CHANGE-ORDER COST QUOTATIONS

When contractors price change orders, which in most cases is a contract obligation, they usually include "*reservation-of-right*" language to allow themselves future requests for additional time or money to complete the job. In other words, contractors include a disclaimer such as *"...further review is necessary in order to assess the impact this change will have on the schedule's sequence of activities and the overall project duration"*[5], with the intention of leaving the door open for future review. In fact, most contractors feel the need to include such provisions in their change order cost proposals, for they have not really completed a total assessment of the time and cost implications of the change requested by the owner.

To overcome this situation, owners should allow contractors to refuse to quote the change order if they can not guarantee zero-impact to the project duration. If the contractor sees a possible delay arising from this change order, such delay will have to be identified and negotiated before having the order executed. This technique has the added benefit of forcing the on-site owner's representative to deal with delay issues caused by the owner, as they are identified, and change orders are issued for pricing and negotiation.

3.7.9 SUB-CONTRACTOR PAYMENT REQUIREMENTS

In order to guarantee that project funds reach subcontractors performing work for the prime contractor, owners include in the contract special clauses to that effect. Under these clauses, the owner establishes payment provisions for the prime contractor, which require certification that the subcontractors are being paid for the work being invoiced. In addition, if the prime contractor fails to pay the subcontractors in a timely and proper manner, owners retain the right to make direct payments to subcontractors and deduct

those sums from future disbursements to the prime contractor. Therefore, owners can assess the risk of disruption due to lack of payment to the subcontractors and act to lessen the chances of delays without having any direct contractual relationship with the subcontractors.

3.8 DISPUTE RESOLUTION CLAUSES

As documented throughout Chapter 2, disagreements are a common trait of construction projects, and they can lead to disputes and claims if not handled appropriately. Hence, owners can go a long way towards mitigating their effects by including specific clauses in the contract documents that identify and describe the way those disagreements will be resolved. Owners have to address this issue of disputes and be prepared to manage them in the most cost-effective way possible. According to Vorster (1993), contracts that leave the dispute resolution process undefined, fail to provide alternatives to litigation. Moreover, they may foster a faster evolution of simple job-site disagreements into complicated disputes. The partnering approach to construction projects, reviewed in Chapter 4, considers as one of its Key Components (Section 4.3) the early definition of a dispute resolution system for these same reasons.

As part of this definition of a project specific DRL, parties should also proceed to select by mutual agreement any third party neutral (i.e., facilitator, mediator, conciliator, advisor, and dispute review board members) to avoid having disagreements that affect their ability to choose the best candidate to help them resolve disputes.

By agreeing on the mechanism to resolve their disputes before they arise, parties, first are providing the tools to the construction team to address and resolve disagreements before they develop into disputes, and second, they are setting the stage for a more flexible process, with greater trust, and fewer uncertainties, resulting in better overall job performance (Vorster, 1993).

3.9 TRAINING AND DEVELOPMENT

Traditionally it was assumed that negotiation skills were inherited and that they could not be trained. However, in recent years universities and professionals have begun to examine the negotiation process in detail as described in the introduction of this chapter, developing programs to improve the negotiation skills of individuals in both professional and non-professional contexts.

People issues have been already identified as a source of disputes in construction. Moreover, Miles (1996) states that although the lower steps in the corporate ladder *"...are the best able to make timely, informed decisions, they are generally not as skilled in interpersonal relationships, negotiation, and dispute resolution."* Thus, it follows that the development of personal skills through formal training in dispute prevention and resolution, communication, and negotiation becomes a key ingredient of any successful ADR program. As this knowledge moves down to the parties responsible of conducting actual negotiations, the overall process will speed up because adversarial and adjudicative approaches will less likely play a part in the resolution of problems.

In addition, new delivery systems like PEpC (Section 3.4), and innovative operating philosophies like Partnering (Chapter 4) represent important changes in the mind-set of the people in charge, so they require training. For example under a PEpC contract, important purchases will be based on performance requirements rather than detailed design information, completely changing the standard procurement procedure. With

regards to partnering, Larson *et al.* (1997), identified the lack of understanding of the partnered system as one of the main barriers for its successful implementation. All these new systems and tools must be taught at all levels and understood by key players in order to maximize their benefits. Some of them will even require special, dedicated training before they can be effectively incorporated into the project.

Office Building Project

Going back to the office-building project, to combat conflicts that arose from these issues previously mentioned, the owner implemented some preventative measures. The owner selected a GMP style contract for a couple of reasons. As design was not complete and change evident, a GMP allowed the flexibility of implementing these changes without changing the upper ceiling cost. This is possible in a fixed price contract, but the majority of changes will result in a price increase. In addition to a GMP, the owner proposed a 50/50 shared savings of the money under the GMP with the contractor. This incentive kept the contractor honest when pricing changes and add-ons. The architect had to be honest as well when specifying material, as they reviewed and negotiated long lead items with he contractor.

With the numerous parties involved, a solid organizational structure kept miscommunications to a minimum. The contractor set up a chain of command, performing phone conversations with the owner on a daily basis. To reduce confusion and increase communication on-site, the GC held daily meetings with all the subcontractors. This brought everyone up to spend on what was going on throughout the job. Those who attended had the authority to act of behalf of their company for the day-to-day operations. If a minor problem came up a change in the schedule, it was resolve at these meetings. Workarounds were scheduled and conflicts were resolved. In addition to the daily meetings, an on-site inspector for the structural designer made is possible to get instant clarification of the design. This was a major time saving measure as it cut out the length “Request for Information” process typically used. The architect also visited the site once or twice a week.

As mentioned, there was no flexibility in the schedule. In this respect, the owner included large liquidated and real damages contractor if contractor did not deliver the product on schedule. This US$ 100 million job was managed by the contractor with only 2 superintendents. Meetings everyday, 50/50 shared savings and the threat of liquidated damages all aided in delivering this project on time and under budget.

3.10 SUMMARY

Early identification of possible areas of conflict for a specific project is the basic premise of this first stage in the DRL. Prevention is based on the assumption that it is more effective, less expensive, and less time consuming, to prevent conflicts from arising than to solve them once they have progressed and escalated. The prevention stage allows the owner to tailor a Dispute Avoidance and Resolution system, which recognizes the possible sources of disputes of the project and provides procedures to resolve them; reducing the chances of having disputes escalate to legal battles. Prevention enhances interconnection between team members and increases collaboration throughout the executive phase.

The vast array of dispute prevention mechanisms presented in this chapter confirms the fact that this stage of the Dispute Resolution Ladder provides the greatest flexibility of action to the parties, while in the long run reduces the cost and time required for conflict resolution. This flexibility allows parties to choose among multiple DART, those that best fit the needs and resources of a particular endeavor. Each group of prevention

techniques addresses differently many of the sources of conflict in the construction industry, previously defined in Chapter 2.

The importance of appropriately evaluating bids and creating good designs, the benefits of adequate risk and uncertainty sharing, the role of the owner in reducing conflict among parties, the relevance of incorporating mechanisms in the contract to help address areas of possible conflict, and the positive valence of incorporating incentive programs to achieve objective alignment and team building are among the most salient areas addressed by these techniques. Clear and adequate communication among the parties, owner involvement, and alignment of objectives are three crucial variables found to be common denominators of the different prevention techniques.

Still, despite the multiple advantages of the prevention stage, investment on prevention is not always an easy task. Prevention requires the recognition of a potential threat and a commitment to avoid it, even if the negative consequences of the dispute have not yet developed. The fantasy and "naïveté" of the parties involved, combined with inadequate knowledge of the advantages of many prevention techniques, might drive owners and constructors to believe "*that the worse will never happen*" to them, thus choosing not to invest resources in this stage and planting the seed for future problems.

Between Prevention and the next stage of the DRL, Negotiation, Chapter 4 reviews the concept of Partnering in construction projects. This system recognizes conflict as an intrinsic aspect of this industry and establishes an approach to prevent it, and to solve those disputes that do occur, strengthening lines of communication and collaboration that foster win/win negotiations. Although Partnering is not a stage in the DRL, its basic premises can be successfully applied to enhance the benefits of many dispute avoidance and resolution techniques along then ladder.

3.11 POINTS FOR DISCUSSION

3.1 Defend or argue the opening quote of the chapter, "For every $1 you spend on claims management during the front-end of the project, you save at least $20 to $25 in claims during construction." Assuming this is true, is fast-tracking a project an ingredient for making claims?

3.2 Escrow bid documents (Section 3.3) are said to be a "clean" set of documents, but to what extent are they too clean? What information must be kept in this set? Should this include ongoing documentation throughout the construction process?

3.3 How does a third party beneficiary clause (Section 3.2.3) reduce the risk of an owner?

3.4 The four innovative project delivery systems presented (Section 3.4) are only a small fraction of systems used. Cite others methods and their advantages/disadvantages relating them to disputes and claims?

3.5 What legal recourse might an As-Built submittal schedule (Section 3.7.6) have? What does this submittal deter the contractor from doing?

3.6 Does the right of refusal on change order (Section 3.7.8) increase or decrease the number of conflicts between the owner and the contractor? Is it optimal to pin a contractor to a zero-impact for the project duration?

3.7 In Case 3.2, it states, "the costs were high, but the facility met the scheduled deadline." Is it true that any schedule can be met if cost is not an issue?

3.8 Engineering document review is a crucial but often overlooked process. With faster schedules and constant approaching deadlines, what are some ways to improve this review process? Should the contractor be involved in the design stage and review process? Can this be accomplished in the design-bid-build procurement model?

3.9 What should the owners' role in the construction process be? If they take and active role, how much does this open them up for liability if things go wrong and vice-versa, if they do not take an active role?

3.10 "Some contractors underbid projects banking on the premises that they can make up the deficit in change orders and claims." Is this a valid statement? Is this strategy generated by the contractors, or forced upon them by the competitive nature of the industry and the owners? How does a public owner prevent this from happening?

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3.13 ENDNOTES

[1] The total scope of work for a 10-year project to design and build a facility to control floods in a region in the Netherlands under a Frame Contract System stated the following: "*The execution of works for the realization of the storm surge barrier in the mouth of the Eastern Scheldt between the islands of Schuwen Duiveland and Noord Beveland, with additional works in the municipalities of...*" (Goudsmit, 1985).

[2] The International Construction Law Review, originally published by Lloyd's of London Press, now known as Informa Professional, a trading division of Informa UK Limited,

Gilmoora House, 57/61 Mortimer Street, London W1W 8HS. Tel: +44 (0)20 7453 2198 Fax: 020 7453 2274.

[3] An author of this book was the Project Manager for the contractor in this project.

[4] In a recent project, an author of this book found a significant difference between the monthly schedule updates submitted to the owner and the actual as-built schedule kept by the contractor. When questioned, the contractor explained that the submittal was a payment requirement, and that he could not afford to have payments delayed because of a disagreement on the sequence of construction or because it showed delays due to design changes. According to the contractor, those problems were going to be addressed at a later date.

[5] Taken from a change order letter of a contractor to an owner in a project where an author of this book participated in.

CHAPTER 4

PARTNERING

"[Partnering is] a method of transforming contractual relationships into a cohesive, project team with a single set of goals and established procedures for resolving disputes in timely and effective manner."

Larson (1995)

A museum in the Northeastern United States was losing money year after year and was in danger of closing because it lacked the ability to attract new customers. The museum had not under gone any recent capital improvement because of its lack of funding. This museum is a publicly funded, not for profit organization. After a desperate plea from the board of directors to the state government, $900,000 was allocated to cover construction cost for an expansion project. The budget was not flexible and no additional money was available from other sources. Since the money came from public funding, the delivery system was restricted to design-bid-build so that a fair competition would be held and the owner would receive a fair price.

To attract new customers, the expansion that was proposed included additional space for artwork as well as cafeteria. A local designer proposed a custom artistically designed addition, contrasting the existing bland 30-year old functional structure. The design

CHAPTER LOOK AHEAD

WHAT IS IT? Partnering is a voluntary, non-binding process, in which all participants come together as a team, focused on principles rather than rules, allowing trust to develop. Partnering has become much more than an ADR technique, by developing into an alternative method of operating a business relationship, a new philosophy in which two or more organizations make long-term commitments to achieve mutual goals by entering into an agreement that requires a team-approach.

WHO IS INVOLVED? Partnering involves the participation of all parties. It is crucial for senior management of these parties to be committed, as lack of commitment breed failure. At a project level, participants should be trained on partnering philosophy. Each participant must clearly understand the role played within the partnership and how their performance will influence the results of the efforts

WHY IS IT IMPORTANT? If trust is developed, a synergistic atmosphere results in which productivity increases. This is opposite of the adversarial situation previously discussed and all too common in the construction industry. If implemented correctly it can align objectives significantly, reducing conflict.

HOW TO APPROACH IT? Develop a strategy. Train the participants. Build the partnering atmosphere. Implement strategy on-site. Hold meetings to review progress. Close-out and reflect on effectiveness.

KEY CONCEPTS

specified glass and colored ceramics stone, large spans, exactly the opposite of what existed, with the intent to change the image of the museum. As a result of the design-bid-build process, the design and drawings were prepared without any involvement of the contractor. The estimate submitted by the designer met the $900,000 budget requirement on paper, but everyone involved up to this point focused more on the look than the reality of cost and budget. The design was completed and publicly bid, under state regulations. Bidders picked up drawings, and submitted bids, with the intention that the award would go to the lowest bidder. Four bids came in at $1.2, $1.25, $1.4 $1.5 million. The procurement process was successful in the sense there was ample competition and the bids were relatively close for the design, but the money was not available to award the project to the lowest bidder of $1.2 million.

At this point, the owner hired an additional consultant, knowledgeable in construction to overcome the owner's lack of familiarity with construction. With no extra money available, how might the owner go about lowering the cost of constructing the design? If the owner asks the designer to make changes to reduce the cost, should there be another competition to decide the lowest bidder? Should it be awarded to the lowest bidder and then value engineered with the designer? The second lowest bidder submitted a close competitive bid, if the design is awarded, then changed can the bid be protested? How might bringing together the designer and the contractor on the same team affect the price?

4.1 DEFINITION AND BENEFITS OF PARTNERING

This chapter provides a review of the concept of Partnering, which developed within the construction industry as a response to the problems associated with the traditional adversarial approach assumed by most parties in projects. The first popular use of partnering dates from the mid-1980's between a large chemical manufacturer and a contractor. The first government agency to adopt partnering was the Army Corps of engineers in 1988. The adversarial approach traditionally used in construction results in poor communication and cooperation that leads to cost and schedule problems and possibly arbitration or litigation.

Partnering is a complete system of operation in the construction environment; therefore it is not considered a Stage of the Dispute Resolution Ladder (DRL). However, the introduction of the concept of partnering in this book is based on the consideration that many of the key principles of this system of operation are congruent and similar to those principles that support the prevention and negotiation stages[1]. Partnering promotes open communications and exchanges of information, encourages collaboration, helps develop trust among the parties, forms and supports the project team, aligns the objectives of team members, and in general, improves the entire construction process by proposing a new way in which team members interact and communicate at every level of the project relationship. Partnering fractures the common adversarial approach in construction projects by "*…replacing deception with open communication, delays with timely decisions, factionalism with synergy, litigation with joint problem-solving, and win/lose with win/win*[2]" (Larson *et al.*, 1997). Partnering, as a model of interaction and communication between the parties, provides important additions to the DRL system, which could expand and guide its implementation.

Partnering has caught the eye of the construction industry, and it currently seems to be adopted faster than any other improvement process introduced in the industry. Partnering has become much more than a Dispute Avoidance and Resolution Technique, by developing into an alternative method of operating a business relationship, a new philosophy in which two or more organizations make long-term commitments to achieve mutual goals by entering into an agreement that requires a team-approach. Partnering is a

voluntary, non-binding process, in which groups of people from different organizations come together as a team focused on principles rather than rules, allowing trust to develop. Studies by the Construction Industry Institute have shown that increased trust results in improved productivity, which in turn reduces cost and schedule problems that lead to litigation (AAA, 1996). Partnering changes the cultural and business framework in which parties interact to complete a project.

Multiple definitions of partnering have been developed throughout the years by researchers and industry organization. The Construction Industry Institute defines partnering as follows:

> *"A long term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participant's resources. This requires changing traditional relationships to a shared culture without regard to organizational boundaries. This relationship is based on trust, dedication to common goals and an understanding of each other's individual expectations and values."*
>
> (CII, 1991)

By developing common goals and an understanding of each parties' needs and individual objectives, parties involved in a project address some of the reasons behind construction disputes identified in Chapter 2 (i.e., lack of objective alignment, unrealistic expectations, poor communication, misunderstandings, and lack of team spirit). Cowan et al. (1992) definition of partnering, stresses the importance of aligning the objectives, but adds the requirement for dispute resolution mechanisms as a key in the partnering model:

> *"[partnering is] a method of transforming contractual relationships into a cohesive, project team with a single set of goals and established procedures for resolving disputes in timely and effective manner."*

In this definition, the importance of addressing procedures to resolve disputes focuses on one of the organizational issues, in specific process problems, identified in Section 1.1, as a characteristic that makes the construction industry prone to disputes. The need to develop one set of goals for the entire building team focuses on the problem of objective alignment reviewed in Chapter 1 as another source of conflict and dispute among members of a project.

The review of these definitions of partnering brings about the similarity between this system and the prevention stage in the DRL. Alignments of objectives, clear communication, integration among team members, and incorporation of DART as part of the relationship, are among others, core components of Partnering as well as of Prevention.

The following excerpt from a sample Partnering specification developed by Groton (1997) shows the level of commitment demanded from the parties, and the working environment being pursued by this approach:

1) *"Each party will function within the laws and statutes applicable to their duties and responsibilities;*
2) *Each party will assist in the other's performance;*
3) *Each party will avoid hindering the order's performance;*
4) *Each party will proceed to fulfill its obligations diligently;*
5) *Each party will cooperate in the common endeavor of the contract."*

These levels of commitment are demonstrated in the following examples.

Pedestrian Bridge (Sherbrooke, Quebec)

This commitment to a common endeavor, cooperation, and assistance between parties is allowing the introduction of new concrete technology in Canada. A partnership between Bouygues SA, the University of Sherbrooke, Quebec, and the US Army Corps of Engineers has proposed the use of a 50,000 p.s.i. concrete mix known as Reactive Powder Concrete (RPC) in a Canadian footbridge over the Magog River in Sherbrooke, Quebec. Bouygues of France, developed RPC, and has used it in beams and pipes in Europe, so far achieving 29,000-p.s.i. compressive strength. The Army Corps of Engineers has used RPC in pipes, poles, beams, precast piles, and girders. Nevertheless, according to ENR (9/9/1996), its use in the Canadian footbridge would be the first application in a complete structure. The partners have agreed to a three-year study to determine RPC's conformity to codes, to lower the costs of the mix, now at about 10 times that of normal strength concrete, and to increase its use throughout the industry.

In this example, partnering is going beyond a single-project method for improving relationships and communication. This partnering alliance is promoting technological innovation in the field, as parties are sharing the risks associated with introducing the RPC state of the art concrete technology in projects. Furthermore, this example shows a long-term international association of private, public, and academic organizations with significantly different objectives that through partnering are working together to develop this technology.

The following three cases further confirm the benefits of partnering in construction projects.

Central Artery and Tunnel (Boston, Massachusetts)

A study conducted by Gilleland *et al.* (1998) compared partnered and non-partnered projects within the multi-billion dollar Central Artery and Tunnel Project in Boston. The survey found that partnered projects outperformed non-partnered ones in each of the following performance categories: Cost Growth, Schedule Growth, Number of Change Orders, and Value Engineering Savings. When team members for these projects were surveyed, 100% of Area Managers considered partnering to be beneficial, 75% of Resident Engineers rated communication in their contracts as 'excellent to good', and 80% of the Project Managers described the resolution of issues as satisfactory. Team members in the partnered projects considered that partnering led to fewer written exchanges and more verbal agreements, which were honored by the parties. In addition, communication was rated to be "excellent to good" by most respondents from various sides (i.e., contracting agency, construction manager, and contractor).

Bus Garage (Cleveland, Ohio)

In the construction of the New Bus Garage in East Cleveland, Ohio, for the Regional Transit Authority, partnering had similar results. Richard Mayer, project manager for the job, stated that 98 % of the problems in the project that could have resulted in arbitration or litigation were resolved at the lowest possible level with the help of partnering (DRT, 1998). This shows how one of the direct results of partnering is a reduction in litigation. Problems are resolved at the jobsite level without the need of third party binding decisions (i.e., arbitration and litigation).

Correctional Facility (San Diego, California)

In a 21-story facility in downtown San Diego, partnering has allowed the tenant of the facility to participate in all aspects of construction and provide important input that reduced rework and last minute change orders at the end of the project (DRT,

1997/1998). The facility was built under the supervision of the final user (i.e., tenant) thanks to partnering between the State agency managing the project and the main contractor. No special contracts were required to incorporate the tenant in the construction process, as both the manager and the builder are benefiting from its input.

Both the Canadian example and the three US projects represent a few of the many successful experiences of partnering in construction projects. The common themes in all of them are improved communication, objective alignment, cooperation, and trust. The following sections review the partnering approach in further detail presenting the phases of its implementation, as well as its key components.

4.2 THE PARTNERING PROCESS

The phases of a successful partnering process can be summarized as follows, based on recommendations by the American Arbitration Association (AAA, 1996):

Phase One: A Long Term Strategy – Senior management defines a long-term vision with supporting strategies and measurable goals and objectives. Resources are allocated towards achieving the goals. Leadership, planning, and partnering sessions are conducted to prepare the organization for the cultural change. This phase also defines the level of commitment by senior management to the partnering process. Failure of top-management to endorse and support this long-term strategy has been previously identified as a barrier for successful partnering

Phase Two: Training – Project participants receive specific training on partnering and learn the strategy developed and set forth in the previous phase. Each participant must clearly understand the role played within the partnership and how his/her performance will influence the results of the efforts. Lack of understanding of the strategy and the partnering process may result in parties returning to the usual adversarial stance when relationships are strained due to normal project disagreements.

Phase Three: Team Building – workshops and meetings are scheduled at a neutral site to begin the team building process to develop trust and open channels of communication. As part of this phase, participants develop the Project Charter and the Issue Resolution Process, together with mechanisms and procedures for continuous review. In this phase, the project team develops common objectives (i.e., alignment). This phase should happen at the beginning of the project, and should involve all key personnel.

Phase Four: On-site Implementation – Partnering activities reach a peak during this phase. Key activities of this phase are:

- Regular partnering meetings.
- Biweekly or monthly assessment evaluation and feedback using the Project Charter as the basis, to monitor the relationship and the level of objective alignment.
- Use of the Issue Resolution Process to solve technical and financial issues, adjusting it to meet new conditions that might develop through project implementation.
- Promotion of innovation and creative problem solving.

Phase Five: Project Close-out – When partnering has been carried out correctly, the results can be very beneficial to all parties as in the Central Artery project described above. At close-out, parties should identify the successes and failures,

and the improvements made throughout the process to incorporate these experiences into their individual as well as joint long term visions.

Each of these phases and activities which have been summarized above, are critical in the success of the partnering effort, and therefore of the project. Partnering efforts that are implemented only halfway will not achieve the levels of success reported by many partnered projects.

The partnering process starts even before an actual project contract is awarded, as shown in the first two phases. Partnering requires certain efforts from participants. These include a long-term commitment to the principles of trust, communication, and collaboration, so companies and agencies are required to establish long-term visions that support this commitment and train their personnel in this new philosophy of operating a construction project. The issue of training and development of human resources for the success of partnering is critical, because of the significant changes this process incorporates into the construction activity.

4.3 KEY COMPONENTS OF PARTNERING

The following are the minimum components of any successful partnering approach as developed by the American Arbitration Association (AAA, 1996), because they provide focus, follow-up, and accountability for all the team members:

Project Charter: This is the equivalent of a Mission Statement with a list of common project goals. All parties sign the final version of the Project Charter and the objectives, and it is posted throughout the job site, meeting rooms, and offices. Figure 14 presents an example of an actual Project Charter for a project with the Environmental Protection Agency (EPA) in the US.

Team Assessment: Biweekly or monthly meetings are scheduled with all parties to review the status of the partnered relationship and the objectives. Written surveys allow an assessment of the levels of trust, communication, and objective alignment perceived by team members.

Issue Resolution Process: Critical in the process of developing the partnering relationship is the definition of the system for "Issue Resolution." Parties should be committed to identify and resolve problems at the lowest possible levels of the organization. Problems should never become disputes, but if they do, the process to resolve them, and the tools available to the responsible parties should be clearly defined (i.e., Dispute Resolution Ladder).

Job Closeout: Once the project is completed and no outstanding issues are pending, parties should proceed with a review of their achievements through the partnering process. The original Project Charter should be compared with the actual results; successes and failures in the relationship should be identified and understood by all parties; and improvement plans should be drafted for implementation in future projects. This after-the-fact review enables the parties to further develop the partnering concept and learn from their mistakes.

As a system, these key components support the partnership as follows. The Charter is the blue-print for the relationship, parties become stakeholders of the joint objectives which they have signed, and decisions and disagreements are always compared and measured against this original set of guidelines and compromises. Through the development of the Charter, common goals are defined between the parties, while they also become aware of each other's individual interests in the project. This will allow the building team to conduct any negotiation based on these needs and goals, rather than contractual requirements.[3]

"PARTNERING AGREEMENT

WE, THE BON FOUCA SUPERFUND PROJECT TEAM, COMMIT TO WORK TOGETHER WITH A SPIRIT OF OPENNESS AND TRUST, AND TO RESPECT THE GOALS AND NEEDS OF THE STAKEHOLDERS.

OUR TEAM IS FOUNDED ON PRINCIPLES OF:

TEAMWORK, MUTUAL RESPECT, OPENNESS, HONESTY, TRUST, PROFESSIONALISM, UNDERSTAND ONE ANOTHER'S POSITIONS, WALKING THE TALK"

WITH THE OBJECTIVES OF:

- *COMPLETING THE PROJECT ON SCHEDULE*
- *COMPLETING THE PROJECT WITHIN BUDGET*
- *DEVELOPING AND MAINTAINING GOOD COMMUNITY RELATIONS BY MINIMIZING IMPACT TO THE COMMUNITY AT LARGE AND COORDINATING ACTIONS THROUGH EPA HEAD*
- *PURSUING SHARED SAVINGS THROUGH VALUE ENGINEERING*
- *DEVELOPING AN MAINTAINING AN AWARENESS OF SAFETY – DAILY THROUGHOUT THE PROJECT – IN ORDER TO ACHIEVE ZERO LOST TIME ACCIDENTS*
- *ESTABLISHING A FORTHRIGHT APPROACH TO MODIFICATIONS AND CLAIMS IN ORDER TO AVOID LITIGATION*
- *REMEDIATING THE SITE IN ACCORDANCE WITH THE NATIONAL CONTINGENCY PLAN*
- *IMPLEMENTING TOTAL QUALITY MANAGEMENT CONCEPTS, SPECIFICALLY IN ADMINISTRATION, ENGINEERING, CONSTRUCTION, AND OPERATIONS*
- *PROVIDING CONTRACTORS THE OPPORTUNITY TO MAKE A REASONABLE PROFIT*
- *ENHANCING REPUTATIONS OF THE STAKEHOLDERS WITH RESPECT TO PUBLIC PERCEPTION OF REMEDIATION/SUPERFUND EFFORTS*

WE, THE UNDERSINGED, IN AN EFFORT TO ACHIEVE THE INTENT OF THE PARTNERING PROCESS, COMMIT THE ABOVE PRINCIPLES AND OBJECTIVES."

Project Charter signed and stamped by each stakeholders

Figure 14 – Sample Project Charter (Ellison et al., 1995)

The Team Assessment is both a quality control mechanisms and a quality improvement tool. As the project develops, new objectives can be added and original ones modified through these review sessions. These sessions also foster communication. The meetings and surveys should encourage a greater acceptance of the partnership philosophy, which in turn should translate in greater benefits for the project. These follow-up sessions are the basis for improving the system during the life of the project, and adapt the philosophy to project and team conditions.

The Issue Resolution Process is a tool to help the partnership overcome disagreements and disputes that will still develop during the project. Unresolved issues will undermine the partnership, prevent parties from achieving the common objectives, and foster adversarial positions that will increase the chances of litigation (see first example in Section 4.4). Finally, the Job closeout review provides an opportunity for assessing the benefits of partnership, and to develop improvement measurements for other projects.

During these meetings, participants can evaluate future opportunities for collaborative work, and even establish a long-term set of objectives towards the execution of that work. This project closeout further strengthens the use of partnering, as parties will learn from their mistakes and improve its implementation.

4.4 THE PARTNERING CONTINUUM

According to a CII report that surveyed more than 1,000 projects associated with this type of relationships, the term "partnering" is being applied to a wide array of management and contractual arrangements (Thompson *et al.*, 1998). Partnering has grown to include a number of different management approaches and contract relationships, although some fall short of being a real partnered project. Thompson *et al.* (1998), proposed the Partnering Continuum to address the many "*shades*" of partnering forms found in the field, while Ellison *et al.* (1995) developed the Synergistic Strategic Partnership Model to present these different levels of partnership. The continuum proposed in Figure 15 is based on the degree of alignment of the individual objectives of each of the parties involved.

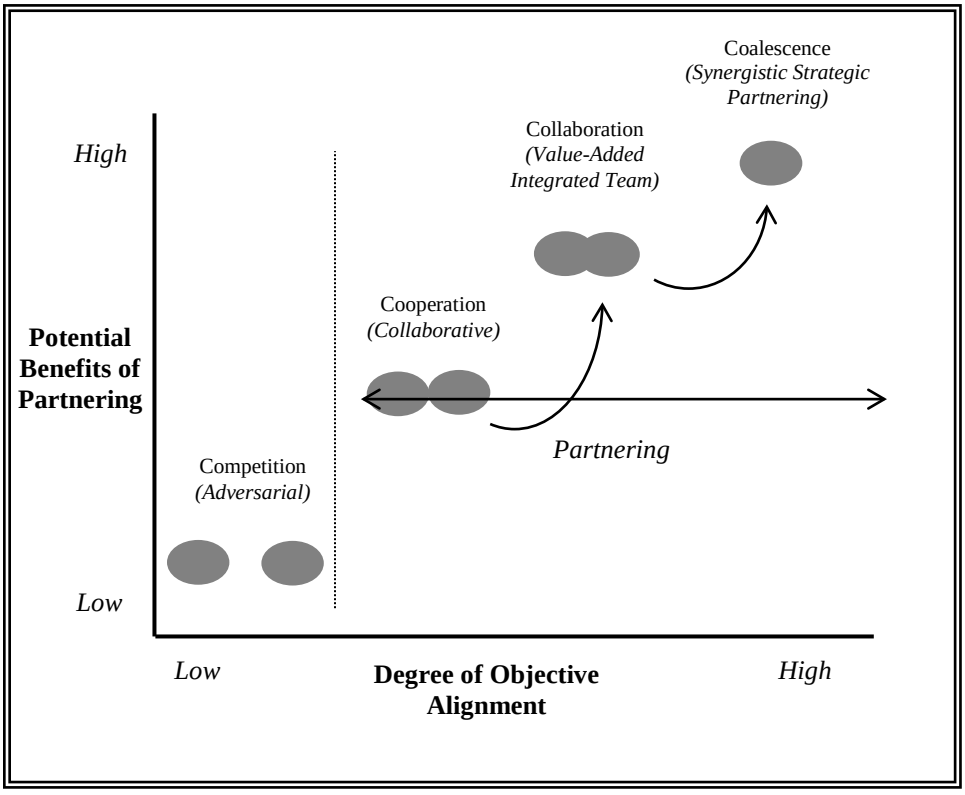

Figure 15 – Partnering Continuum (Thompson et al., 1998)[4]

Table 10 – Summary of Partnering Levels
(based on Thompson et al., 1998 and Ellison et al., 1995)

Project Characteristic	COMPETITION (Adversarial)	COOPERATION (Collaboration)	COLLABORATIVE (Value-Added)	COALESCING (Synergistic)
Responsibilities and Objectives	Each side has well defined objectives and responsibilities. Objectives are not common; might be conflicting.	Common objectives that are specific to the project.	One set of goals for a successful project. Long-term goals beyond single application. Typically includes incentive for exceeding project goals.	Total alignment of objectives. Goals and objectives are shared, including cost information. Increased accountability. Autonomy in decision making.
Level of Trust between Parties	Little trust between the parties.	Some degree of trust, in order to work for the common objectives.	High degree of trust.	Very high levels of trust. Transparent interface.
Level of Communication	Single points of contact within the organizations. Owner supervises contractor.	High degree of communication. Multiple points of contact.	Openness, honesty. Senior level "champions" from both organizations foster communication and remove "barriers."	Extensive communication, collaboration and commitment from all levels of the organization.
Type of Relationship	Adversarial. Primarily a defensive position. Coercive environment. Short-term focus.	Improved interpersonal relationships. Cooperation.	Integrated team of client and contractor personal and resources. Team creates separate organization for the life of the project. Long-term focus multi-project, with shared authority.	Transparent interface. Parties share resources and cultures are integrated to fit the applications.
Risk Sharing	No shared risks.	Limited risk sharing.	Increasing risk sharing.	Joint sharing of liabilities over failures and gains from successes.
Probability of Disputes	Disputes are common; often requires binding dispute resolution methods to solve them (win/lose).	Procedures to address and resolve disputes are established. Solutions are found through some degree of compromise and cooperation (win/win).	Responsibility is shared among the team, so problems and disagreements are solved within the team before becoming disputes.	Problems are addressed as a team and resolved at the expense of neither party.
Typical Project Results	Cost and schedule overruns. Both sides finish the project without realizing their objectives.	Schedule reduction 10.5%; Cost reduction 16.3%; RFI turn-around 14 days Vs. 30-60 days	40% reduction in job-hours; 17% reduction in overhead; 10% improvement worker utilization rate; 10% project costs; 100% success in meeting budget and schedule; 50% reduction in engineering rework.	15% reduction in equipment and construction costs; 33% reduction in engineering rates; 100% acceptance of risk by the owner with a low fee charged by contractor.

The characteristics of these different levels of partnering within the continuum as compared to the standard adversarial approach, together with the improvements introduced by each one, are presented and summarized in Table 10. Both models of the continuum provide a partnering process, and they highlight the importance of objective alignment within the building team.

In the Partnering Continuum, each of the three levels (shades) of partnering are based on the degree of objective alignment achieved by the project team. The greater the alignment of objectives and goals, the more benefits the parties will be able to achieve through improved communication and collaboration, greater trust, risk sharing, and resolution of disputes within the project team. Both models, by interrelating the different stages of the Partnering continuum with the project characteristics, can serve as a guide for those involved in construction, helping define the nature of the relationship, even if they do not fully implement the Partnering systems. By comparing each level of Partnering with the Competition Stage, in one or a series of projects, parties can determine the level of objective alignment that can help them achieve their own needs. Parties can also compare the expected project benefits versus the resources required to achieve the specific level, in order to select the proper partnering stage. Furthermore, the continuum allows for a clear definition of what to expect at each level of partnering to avoid misunderstandings and erroneous expectations during implementation. The Key Components of Partnering described in Section 4.3 represent the basic stage of partnering (i.e., Cooperation/Collaboration).

The following two cases show both extremes of the Partnering Continuum. In the first example, parties returned to the Competition/Adversarial stage after attempting to develop a partnering agreement. Apparently, their inability to resolve initial problems with site conditions and design errors had an effect on the partnering approach. The second example shows projects in the high-tech arena that have successfully reached the Coalescing Stage.

Tomlinson Bridge (New Haven, CT)

The Tomlinson Bridge project in New Haven, Conn., is an example of a partnering approach that failed victim to a claims battle between the State and the contractor, not being able to overcome the Adversarial/Competition approach. The $87.7 million project to replace a 69-year-old bridge was two years behind schedule; when the article appeared in ENR (5/4/1998), because of numerous disputes over site conditions, contract drawings, and removal of contaminated material. The Dept. of Transportation conceded that partnering methods failed as the contractor encountered substantial obstructions during demolition and significant errors in the drawings, which had delayed the project and resulted in cost overruns. The issue resolution process in the partnering approach apparently failed. It was speculated that the parties where not able to develop an initial degree of trust[5]. Both parties agreed that communications were strained despite the initial attempts at partnering, making progress more difficult (ENR, 5/4/1998).

Further research on this case would be required to establish responsibilities, and learn how the failure in the partnering approach contributed to the development of the claims. In any case, one thing seems clear: the job had significant uncertainties with regards to the site conditions that were not addressed by the owner at time of bid (i.e., risk sharing); the owner knew from the beginning that at least two other structures had been there since the 1800's (ENR, 5/4/1998); contamination of the soil should have been expected, since one of the reasons behind the project was the need to allow for larger oil tankers to access the many refineries in the area. An unbalanced allocation risk (Section 3.2) by the owner

might be behind the failure of this partnering arrangement, and the failure to align the parties' objectives and develop the necessary trust to resolve the initial problems.

Intel (Portland, Oregon)

This case shows how projects achieve a total alignment of risks and the benefits that result. The design and construction of high-tech production facilities for companies like Intel, is an example of complex large-scale engineering systems where partnering has significantly changed the construction process. The Lean Construction Delivery System Model (Miles, 1996; CIOB, 1999) illustrates the ways in which partnering has allowed parties to maximize the resources of each team member. In this model the partnering relationship overcomes the difficulties confronted by the Tomlinson Bridge project, by moving the building team along the partnering continuum to a higher level of integration, such as Coalescence and Synergistic.

The structure of one of these projects is shown in Figure 16. This structure is clearly a departure from the typical pyramid shaped organization charts of construction jobs, where each party sits underneath the client with clearly defined responsibilities and contractual boundaries (i.e., LNGT Project, Chapter 1). Under this organization, all parties were part of a whole, centered on the project and its objectives. All decisions were based on the ultimate goal: the project. This project delivery system is based on multitasking, multi-discipline, multi-functional working groups and partnering (Miles, 1996). Each working group makes joint decisions on the design based on constructability, achievement of the design criteria, budget, schedule, and quality (CIOB, 1999).

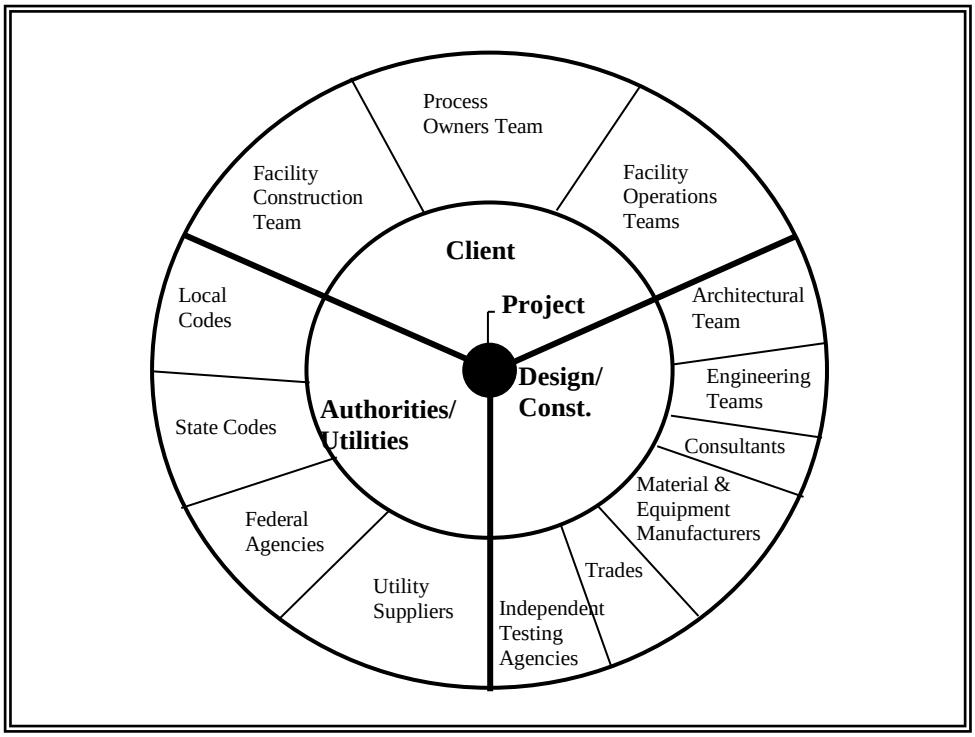

Figure 16 – Structure of an Ultra-Fast Track High-Tech Design-Build Project (Miles, 1996)

Such high level of integration is exemplified by the fact that from the beginning of the project, the construction team met regularly with the start-up teams and the client's

facility operation group. Changes in the design were evaluated early on by the final users of the facility, and their comments, suggestions, and requirements were incorporated into the process. In addition, suppliers of major equipment and technology participated in the design development phases in order to incorporate their knowledge and experience into the final construction documents.[6] Furthermore, a cost control group served as the router for all exchanges of information, tracking all communications between the design and construction groups, which allowed them to provide management with real-time cost data at any given time. With this cost information, the team was able to make informed decisions on changes, and their implications in the long run with regards to the project budget.

A company that has successfully implemented this delivery system is Hoffman Construction Co., Portland, Oregon (ENR, 5/27/1996). In 1993 a Hoffman's construction team won Intel Corp.'s Pegasus Award for the "breakthrough success" in solving crucial technical and building issues during the construction of a 435,000-sq-ft, $110 million chip fabrication plant outside of Portland. The plant was built in only 14 months; two months ahead of schedule. When asked about his secret, Hoffman's project manager responded (ENR, 5/27/1996):

> *"To start with, throw the linear approach out the window. We do everything with a tremendous amount of concurrency. We are driving safety rates to extremely low levels, even in a highly risky environment*[7]*. We self-perform a great deal of our work. We interact with organized and open-shop labor, often on the same site. What we have tried is to create synergies and bypass institutional barriers that keep [builders] from reaching their full potential.... new techniques come from understanding the design process and the owner's needs. [Missing] your client's technology windows can cost owners billions of dollars. You have to be dead right – or you're simply dead."*

Hoffman is a full service construction company, and unlike other contractors who often contract out most of the work, they have developed in-house capabilities in many areas to meet project demands. Among the innovative techniques developed by Hoffman, is the concept of Speed Engineering where the company integrates their in-house structural engineers with the owner's design team to develop the fastest solution for bringing the structure off the ground and to meet the owner's need for a faster design and construction process of their facilities. Furthermore, they analyze material availability, structural details for constructability, and building systems for pre-fabrication opportunities (See Section 3.6.1, Constructability Analysis). Hoffman reports that project costs can be lowered through the speed engineering process, but the emphasis is on timely, safe completion (Hoffman, 1999).

In the Lean Construction Model, the basic concepts of Partnering have been fully implemented along Partnering Continuum. The different groups evolve over the life of the project as requirements change. The organization is shaped and reshaped according to the project, and from the beginning, parties are able to align their objectives and redesign the total work process. All of the costs associated with this system have been recovered through partnering agreements and outstanding project performance (Miles, 1996). This ultimate stage of partnering, Coalescing, has resulted in significant savings in time and costs in the design and construction of a number of projects, helping both owners and contractors achieve higher levels of productivity[8].

Museum Project

Relating partnering to the Museum project, it can be seen that the principles of Partnering, when applied correctly, can reduce and even eliminate an adversarial situation. After the bids were analyzed, the owner's consultant reviewed the design and value engineered it with the designer and the owner. To be consistent with state

regulations the owner went back to the two lowest bidders and asked for a reprice with the design alternates. This method promoted fair competition comparing apples to apples, in addition the owner asked for other suggestions to reduce the price to meet the strict budget requirements. Both bidders concurred and thought it was fair. Bids were submitted by the two lowest bidders, coming in at $1.0 and $1.6 million. The owner awarded the project to the lowest bidder and the bid was not protested.

With the total construction costs still over the budget, the owner's consultant implemented partnering for the project. The contractor worked with the owner's consultant for further value engineer the addition. The contractor suggested eliminating the basement, moving heating and ventilation systems to the roof, and some modification to the curtain wall design. At the same time, the designer was approving the design through the shop-drawing phase. Construction started before design was complete. The project continued on schedule with changes being implemented on an ongoing basis. The synergistic atmosphere allowed the owner the ability to make design and value engineering changes, without sacrificing the quality of the structure.

The key concepts of partnering implemented included weekly meetings, openness and commitment of all the parties involved to process. The consultant hired by the owner was authorized to make decision on behalf of the owner whenever necessary. Upper level management commitment was a major strength as well as cooperative field crew. Claims and change orders where handled and resolved on a daily basis. Trade contractors were involved in meetings to value engineer, especially HVAC contractor. As a result, the project was completed on time and under budget by $10,000 ($890,000). At the end of the project when the closeout phase occurred, the owner realized that the contract was never signed, as everyone was so anxious to get underway and close in before winter. The contract was signed at the end of the project.

4.5 SUMMARY

Partnering is a complete system of operation in the construction environment; hence, it is not considered a stage in the DRL. However, the introduction of the concept of Partnering was based on the consideration that many of the key principles of this system of operation are congruent with those of the DRL; and thus can enhance the different stages, even if the complete Partnering format is not being implemented. Partnering fractures the common adversarial approach in construction projects and replaces it with open communication, timely decisions, synergy, joint problem solving, and *win/win* philosophy.

Among the multiple advantages of partnering are: reduced exposure to liability through open communication, early problem identification and resolution; risk sharing; increased productivity; better quality of work through the empowerment of workers; lower costs; better cash flow; better decision making and commitment to resolving problems; and better opportunity for a successful project. As Hunter *et al.* (1995) so eloquently said, *"…an ounce of partnering prevents a pound of problems."*

The Partnering Continuum establishes a direct relationship between the degree of objective alignment between the parties to a project, and the potential benefits of Partnering, where the Coalescence phase represents the greatest alignment of objectives and offers the greatest benefits. Through the use of this continuum each project can determine the level of objective alignment it has and/or desires, and from this estimate the possible benefits that the system could provide. Nevertheless, despite its many advantages, partnering can experience problems through its implementation associated to:

1) The demand it places on everyone committing to the partnering process.

2) The difficulty participants may have with taking the risk of trusting others.

3) The tendencies of many people to believe that conflicts can only be solved through the win/lose approach.

4.6 POINTS FOR DISCUSSION

4.1 What are the five phases of the partnering process (Section 4.2)? What stages are most important for the success of the partnering agreement? Can an agreement work if some of the stages are omitted?

4.2 One of the founding principles behind partnering is transparency and openness (Section 4.3). Does this build a certain trust between the owner and the contractor? Is it in the best interest of the owner or contractor to be open about all aspects of the project, specifically mistakes or errors?

4.3 Partnering worked well for Hoffman construction (Section 4.4), who self-performs the majority of their work. How is partnering affected when there are numerous parties and sub-contractors involved?

4.4 Are the participants in the Partnering Agreement (Section 4.3) legally bound to this commitment? Does this document have any bearing in a court of law?

4.5 How does partnering fit into the DRL proposed by Findley (Section 2.3.2)? Is this agreement perpetual, including other projects, or does it end with a completed project? How much credibility has the agreement lost for the rest of the project if a dispute does reach litigation?

4.6 What options are available to the parties involved if the partnering agreement doesn't work as in Tomlinson Bridge project? What steps could be taken to help deter an agreement from going south?

4.7 Should owners uses past partnering experiences as a means to pre-qualify designers and constructors? What benefits would this method have? Does it create an incentive for contractors to work at maintaining the partnering agreement?

4.8 If there are numerous parties involved and one does not actively participate, what consequences might it have on the partnering agreement?

4.9 Pay now or pay later is a statement often associated with construction claims. What are the differences between taking preventative measures and incentive programs? Considering this concept, how much money should be invested in partnering? Are there other sacrifices made by either party by entering into such an agreement?

4.10 Is partnering feasible for all projects? Does partnering work better depending on the size or complexity of the project? How does partnering relate to the different delivery systems (Section 1.2.2)?

4.7 REFERENCES

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4.8 ENDNOTES

[1] To this effect, Groton (1997) concluded, *"Partnering is both the overall philosophy for dispute management and one of the tools for avoiding disputes."* In this book, partnering is being considered as a philosophy.
[2] See Chapter 5: Negotiation for more on win/lose and win/win negotiations.
[3] See Chapter 5 for Position-Based versus Needs-Based Negotiations.
[4] In parenBook is the equivalent level from the Ellison et al., 1995 model
[5] A survey on barriers to partnering identified trust between parties as the most critical aspect in the success of the implementation of this approach. Thirty one percent of respondents considered the failure to build a true relationship of trust as a barrier to partnering (Larson *et al*., 1997).
[6] This concept of supplier involvement in the engineering process is behind the new PEpC delivery system developed and proposed by the CII, and reviewed in Section 3.3.3.
[7] Hoffman's Lost Accident Rate per 200,000 works hours since 1994 has been 600% less than the industry average (Hoffman, 1999).
[8] Tesco Stores has reduced the capital costs of their stores by 40% since 1991; Needahm Co., a construction company from Colorado, has been able to reduced project times and costs by as much as 30%; Pacific Contracting of San Francisco, has increased their annual turnover by 20% in 18 months with the same staff (CIOB, 1999).

CHAPTER 5

STAGE 2: NEGOTIATION

"there is a fixed-size cake to divide and each party would rather have a bigger slice than a smaller slice"

(Hill 1995)

A $US 380 million underground highway interchange needed to be built under an existing mainline tunnel in a metropolitan city. The interchange project consisted of 4 lanes Northbound and 4 lanes Southbound. The contract for the project also included the construction of: slurry walls; temporary decking and bridges; drilled shafts; cast-in-place invert slab, walls, and roof system; support of excavation; groundwater control; paving; underpinning of 14 mainline bents and 6 ramp bents supporting approximately 1,400 feet of an existing elevated viaduct. The construction of ramps and connections to and from two existing tunnels was also performed under this contract, along with all the associated duct work. Major utility relocations, temporary facilities and service connections were included as well.

This contract was a fixed price, publicly bid contract and scheduled to be completed in 3½ years. The major participants involved in this contract included the owner, a program

CHAPTER LOOK AHEAD

WHAT IS IT? Negotiation is aimed at resolving the problems when they surface, taking into consideration each party's interests to reach a win-win solution. The field of negotiation analyzes how participants interact when a decision between two or more parties is made. The negotiation process entails preparing for the negotiation, selection of an appropriate style, and commitment to reach an agreeable solution.

WHO IS INVOLVED? Negotiation, similar to that of Partnering, involves participants of all levels of management. Specifically it focuses on providing the lower levels of management with the tools necessary to resolve conflict. It also involves any third parties that are introduced to resolve disputes.

WHY IS IT IMPORTANT? If a mutually acceptable solution can be negotiated when a conflict arises, it keeps it from escalating. Participants save time, money and even their relationship by addressing conflicts at an early stage. The more educated the participants are in the theory of negotiation the easier it is to reach an acceptable solution.

HOW TO APPROACH IT? Understand the difference between positions and interests. Review the different styles available when negotiating and recognize how applicable they are in different contexts. Apply the techniques learned to your individual situation. Implement one of the different negotiation techniques.

KEY CONCEPTS

manager (a representative of the owner), a general contractor, and a designer. It should be noted that this contract was one of many integrated projects in the owner's overall construction program. This contract interfaced with 10 other contracts in this program. The schedule of this contract was tied to each these contracts, making certain milestones and final completion date of the essence.

Due to such a tight schedule, the contract was let before a solid final design was issued. This led to 13 major design changes after the award of the bid, which revised more than 1000 plan sheets, some more than once. For example, one major design change being considered that had not been part of this contract focused on whether to leave the tunnel sections open or cover them over. Eventually it was decided to add the closure of the tunnels to this contract. These changes resulted in an $US 86 million request for contract increase by the contractor, a 21% price increase from the original contract!

Any project manager having to deal with these change orders will have some interesting questions in their mind. Could the owner have set up the contract to allow for these change orders before the contractor started work? Would these change orders be able to be handled in a non-confrontational manner? Could these change orders be resolved through simple negotiations between the owner or its representative and the contractor at the jobsite? Should the general contractor take a hard position on some of the issues that the owner would consider more important? What are the interests/positions of the owners or the contractor? What sources of power does each of the participants have entering into this negotiation? Are the interests of the owner and the contractor aligned in this project?

5.1 THE FIELD OF NEGOTIATION

The field of negotiation has made rapid advances since the 1970's when its popularity increased among the academic community. Currently all of the top business and law school programs have courses that teach the theory of negotiation. Although the focus of this book is not specifically to teach these theories, they are crucial in the steps taken to resolve disputes in the construction industry. Most owners, contractors, and engineers do not posses these skills, and therefore many disputes escalate when they could have been avoided. An overview of these theories will be presented in this chapter, but it is recommended that the reader indulge in outside readings by the experts in this field. Susskind et al. (1987), Fisher et al. (1981), Ury et al. (1988) and Lewicki et al. (1985) have all published books on resolving disputes through negotiation. Although they do not directly address negotiation in the construction industry, the principles are generally the same and they will build a solid basis of knowledge for the reader.

Negotiation is the most important tool available to manage and resolve disputes in construction projects. This occurs after the Prevention stage (Chapter 3), which assumes that conflicts will arise, and prepares the parties on how to manage them and mitigate their effects. Negotiation represents the first stage where an attempt is made to resolve the dispute. Here, parties are required to come together and arrive at an agreeable settlement through communication. A successful negotiation should result in a solution acceptable to both parties that will not harm their relationship. This implies collaboration, trust, and common objectives (all ancient notions as it is presented in Chapter 2).

Another important benefit of negotiation relates to control over the outcome. When parties resolve their disputes through negotiation, settlements result from a joint agreement, essentially controlled by the parties, and generally inclined towards a win/win outcome. Conversely, when a third party is given the responsibility of establishing the facts and making a decision, the outcome will most likely be based only on the interpretation of the contract, and therefore tend to produce a win/lose outcome.

5.2 POSITIONS VERSUS INTERESTS

A well-planned approach to negotiation should begin with the notions of partnering explained in Chapter 4. From the building of teams to the final stages, parties should attempt to resolve all disagreements through negotiations based on an honest exchange of information. This dialogue addresses the underlying needs of each party, so at least some of them are incorporated into the solution. In other words, negotiations should focus on the individual and collective *interests* of the parties, instead of concentrating on *positions.* A position might be, "He wants $100,000 for the change order now," whereas the underlying interests are, "Although he willing to do the extra work, he is low on cash and cannot fund the work." These interests are actually where the conflicts develop, but when they turn into positions, parties lose sight of the underlying conflict at hand. By reverting to interest-based negotiations, participants will be more willing to understand both sides of the problem and develop a "non-zero sum" solution. A "zero sum" solution is when every benefit received by one party is at the expense of the another.

Interest based negotiations are virtually non-existent in the construction industry, because neither side wants to give up their true intentions, thinking that they will be cheated. This all goes back to the level of trust that each party has for one another. The most common approach to negotiations in the construction arena is "positional" bargaining, where each party assumes a position, and then seeks to maintain it during negotiations. These positions are chosen to be defended based on contract language and the law. They have been elected as mere rationalizations and means to an end, but not as the end itself, and are usually contradictory. Negotiations over positions can degenerate into an attempt from each side to force the other to first abandon its position, turning the negotiation into a purely "win/lose" proposition that inhibits innovation in the search for solutions.

Fisher *et al.* (1981) championed the theory of interest-based negotiation. Arguing over positions is unwise, inefficient and it endangers an ongoing relationship. This type of negotiation only gets more complicated when numerous parties are involved. "Needs-based" (interest-based) negotiations look beyond positions to address each party's actual goals without engaging in a positional contest of will. Needs-based negotiations encourage creative searches for alternative means to the real goals, and they do not represent a surrendering of a given position.

Take these two examples of a simple negotiation between the general contractor and a subcontractor that is unable to meet a milestone in the contract.

SUB: I will not be able to finish on time.
GC: You will finish as scheduled.
SUB: I need two extra weeks.
GC: You cannot have two weeks.
SUB: If I do not get two weeks, I will not be able to finish on time.
GC: No, you will finish according to the contract or we will collect damages and replace you.

This position-based type of negotiation will go around in circles, until one of the parties abandons their position, or they end up in court. From this dialogue, it is not clear why they are even arguing. Looking at the same conflict from an interest-based negotiation, one can see the differences.

SUB: I will not be able to finish on time.
GC: Why can you finish as promised? What are the reasons?
SUB: My supplier will not be able to deliver the materials until next week, causing me to finish two weeks behind schedule.

GC: As you know, the schedule is very tight for this project and there is little float available. Are there any other suppliers who can deliver on time?
SUB: Yes, but they are more expensive, more than the damages incurred by finishing late.
GC: Although you are responsible for meeting the milestone, I understand your dilemma. Let me see what I can do. I know some other suppliers that might be able to help.

In this interest-based negotiation, the root of the conflict is uncovered, and a mutual agreeable solution can be reached. Although the general contractor seems to have the most power in this negotiation, the subcontractor has some as well. If the schedule begins to slip because of this delayed finish, and they wind up in a court battle, it may take years to award damages. In addition, the damages may not be sufficient to cover the actual costs incurred by the contractor.

When the "Im'right you're wrong!" position is abandon, it allows participants to address the underlying concerns, which leads to the generation of alternatives that would not seem readily apparent at first. In this fashion, Hollands (1989)[1] suggests that parties in a construction disputes should not only consider needs or interests that are derived from the contract documents, but parties should also look for alternatives that can solve the disagreements without court intervention. After all, parties usually know and understand the facts better than they can communicate to an arbitrator, judge, or jury. Therefore, they should be able to develop a solution that incorporates and maximizes this knowledge. He recommends that the following aspects be incorporated into the negotiation:

- *"Substantive (e.g., money, time, long-term market);*
- *Procedural (e.g., confidentiality, protocol, administration);*
- *Psychological (e.g., need for respect, status, security, recognition)."*

(Hollands, 1989)

The result of this positional bargaining is a "zero sum" solution. Even if perceived gains do not have to equal perceived losses, any change in the proposed result will provide an advantage to one party and a disadvantage to the other. Recognizing whether a particular negotiation is zero or non-zero sum can be very important in planning for and actually carrying out the negotiation, as dispute negotiations often seen as zero-sum, may have non-zero sum aspects or alternative solutions (Boskey, 1993).

Negotiation parties often feel they are involved in a zero-sum situation in which court proceedings are the only solution to the dispute. They believe *"there is a fixed-size cake to divide and each party would rather have a bigger slice than a smaller slice"* (Hill, 1995). However, statistics from the American Arbitration Association show that few business situations are zero-sum games and that by cooperating, business partners can expand their markets and develop mutual benefits. For example, out of the 3,075 cases that requested AAA mediation (i.e., a form of facilitated negotiations) in 1993, 1,136 were settled, 151 were closed, 293 were withdrawn, 644 were pending, and 851 were in some other status at the end of the year (Langeland, 1995). In other words, over 50% of the cases where closed through this form of aided negotiation where parties develop solutions, which are acceptable to both parties (i.e., win/win or non-zero-sum), and only 28% proceeded to another form of dispute resolution.

It must be noted that sometimes interests based negotiations are not the best choice of action. In the few disputes that are completely 'cut and dry', other approaches such as rights or power can be used to resolve the dispute (Ury *et al.*, 1988). More information is presented in Chapter 9 on these types of disputes.

5.3 NEGOTIATION STYLES

Five strategies of negotiation are common in the field; avoiding, competing, accommodating, compromising, and collaborating (Figure 17). Although they have been worded and represented by different adjectives by different people, they still encompass all the different styles that participants use. Each strategy is valuable in the construction atmosphere depending on the situations. At the same time if they are used at the wrong time, they can spiral a conflict into the courts rapidly.

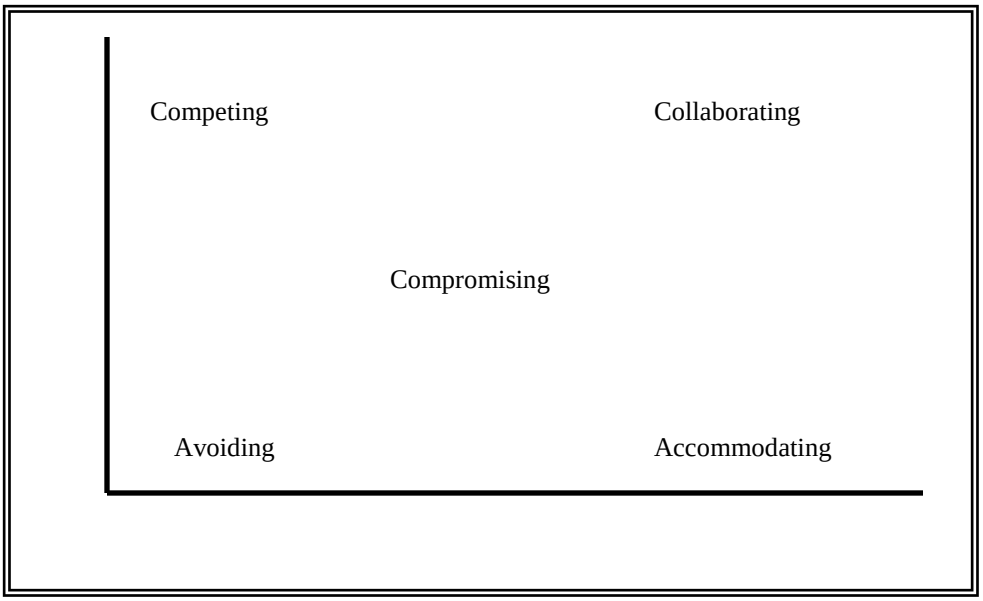

Figure 17 – Negotiation Strategies (Thomas, 1976)

Avoiding a situation or conflict is just how it sounds. Sometimes trivial problems are best ignored. An example might be that the union workers are upset because there are only 20 bathrooms on-site instead of 22. At some point, the validity of a conflict must be addressed, and usually this is done subconsciously. Imagine the number of erroneous situations that could escalate into conflicts. Most project managers already spend too much time on perceived problems that are not worth their time. On the other hand, a legitimate concern from another participant that is avoided can have enormous repercussions. If there were 20 bathrooms on-site, and no female bathrooms, the union workers might have a legitimate complaint. This problem could easily be solved, but it could also escalate quickly if avoided.

Competing is the style that most of the participants in the construction industry take. “I’m not going to budge, because they will just take advantage of me.” This adversarial style leads to litigation. Although the competing style is necessary, it is often misused. Think about the issue of safety on the construction site, which is usually the responsibility of the contractor. If a subcontractor approached the contractor and requested some leniency in meeting certain safety requirements, what style should the contractor reply with? In this situation if the contractor has responsibility for the site safety, the contractor should take a competing style. On the other hand, it would be unwise for sub to continue with the competing style. The worst time to use the competing style of negotiation is when you are wrong or to compete for the sake of it.

Accommodating is the complete opposite of competing. This style focuses on accommodating the interests and requests of the other side. This is usually the easiest

way to resolve a dispute. In many times when a party assumes responsibility for their actions or mistakes, if they take on an accommodating style of negotiation they might reach a mutually acceptable outcome even thought they are at fault. The exact opposite can be true if a competing style is adopted by the party at fault. Accommodating another party when applicable can develop trust among participants.

Compromising is when both or all of the participants give in on some points or interests for the sake of acquiring others. Although this is usually not the optimal situation, it is one in which all of the parties are willing to work together. Compromising works well when both or all of the parties have valid complaints in a conflict. An example of this might be adverse weather conditions. A contractor might ask for a 10-day time extension, but the owner might feel that work could have continued through the weather. Both may have a valid claim and a compromise of 6 days could be reached for the severe days. Although not always the most optimal solution, keep in mind that the alternative to compromising on some of the trivial points is litigation.

Collaborating is one of the primary principles in Partnering. In collaborating, the participants work together to design, develop and implement a solution that is acceptable to all. This style of negotiation flourishes in a synergistic atmosphere. The downside of this style is that it is rarely used. The delivery systems and contract selection do not usually promote this atmosphere. An example of this is when a contractor and a designer are brought in the project early to add their input and help steer the project based on their expertise.

5.4 PREPARATION

Preparation for a negotiation cannot be stressed enough! To go into a negotiation without doing your homework will only spell disaster. It can make valid claims seem invalid, fuel personality conflicts, prolong the resolution process, frustrate others and ruin relationships. When starting to prepare for a negotiation you should begin by figuring out exactly what it is that you hope to achieve. What are your needs? In the same context, one should also make a prediction as to what the other participant's interests are. Understand and identify where the might be conflict and plan accordingly.

When determining needs and interest, an objective determination can be made about your BATNA (Fisher, 1991). The BATNA is the **B**est **A**lternative **T**o a **N**egotiated **A**greement, in other words, the point at which a negotiator is willing to walk away from the negotiations. Below this point, there is nothing that the other side can propose that is better than not negotiating at all. For example, if an owner is negotiating with a set of contractors for the lowest price on a quality guaranteed contract and has received a bid of $100,000 (the BATNA); when negotiating with the next contractor, it would be worthless to negotiate above this point. A BATNA is not something that the negotiator wishes for, but it is rather determined by external factors. It should not be overly ambitious but honestly the best alternative, for if things do not go as planed the result may be to accept the BATNA. Once your BATNA has been identified, identify the BATNA for the other parties involved.

Source of power are another aspect of negotiations that one can account for before the negotiations begin. Examine the situation and identify what sources of power that each side possesses. By doing so it will allow you to leverage your position in the negotiation and come up with defenses against sources of power that the other side may have.

Once the BATNAs and sources of power are identified, one can begin to determine how the negotiations might go. Develop a thorough list of needs and interests, prioritize them, and do the same for the other side. Start to develop solutions to the problem that will be

acceptable to both sides. Make sure that these are optimistic but not too greedy. This target solution is the aspiration point. Although you may have many great solutions to the dilemma, keeping consistent with the win-win solution, one must be open to solutions that are presented by the other side.

By preparing for the negotiation, the conflict will most likely be resolved faster and have a more optimal result for all the parties involved. The following sections review three important techniques designed to improve the negotiation process in the construction industry and correct, "people issues and process problems" that might interfere with the resolution of disputes at this DRL stage. These techniques, Structured Negotiations, Step Negotiations, and Facilitated Negotiations, are presented in the following three sections. When reading these sections keep in mind the theory of negotiation and how they might apply.

5.5 STEP NEGOTIATION

A way to structure negotiations that encourages the resolution of disagreements at the lowest possible organizational level is to establish a contract requirement for Step Negotiations. Under this approach, the representative of each party directly involved with the issues must first address problems, within a limited timeframe. If parties fail to settle the dispute in the time stipulated, they must endorse the problem to their immediate superior, who will then attempt an agreeable settlement based on the advancements of the first step. If this level does not succeed either, the matter is raised to a higher echelon in the organization (Figure 18).

Step negotiations force each level of the firm to use up, within time limits, all the resources available to elucidate the problem without raising the matter to the next step. An example of this type of incentive is found in the Canadian Public Works arena (Section 6.2), where contracts require that before the Agency Review Board can be incorporated into the dispute, the agents must submit the matter to the Minister of Public Works. The Ministry reviews the attempts made to achieve a resolution, and then has the option of settling the case with the contractor. This contract encourages contract administrators to assume a role in the resolution of disputes, rather than relying exclusively on the Board.

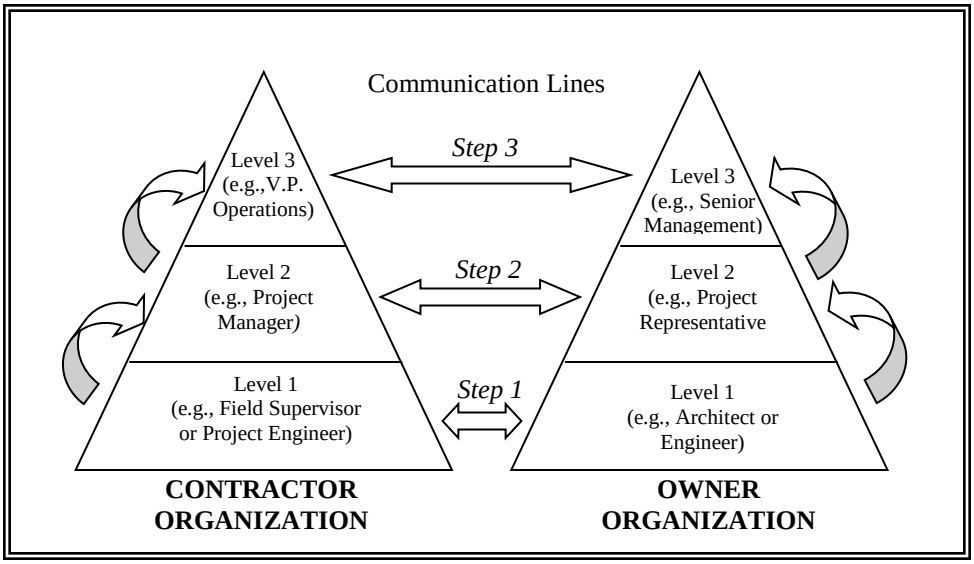

Figure 18 – Diagram of Step Negotiations showing Levels and Communication Lines

5.6 STRUCTURED NEGOTIATIONS

On a recent Florida case cited by Kane (1992), litigation began to threaten a power plant contract dispute in excess of $20 million. The example describes how the Utility and the contractor set up a structured negotiation process that took place over a 12-month period. Upper management accepted an honest, open airing of the facts in the dispute with a commitment towards good-faith negotiations. After many meetings, and a thorough allocation of resources including time, money, and people, a settlement was finally reached without a lawsuit being filed. This case was resolved in one third of the time usually needed to conclude a dispute of this magnitude using court proceedings. The average civil case in the state court takes 14 months to reach a conclusion, while at a federal level it takes 7-11 months from filing to disposition. In the United States, the number of civil cases that are more than 3 years old in district courts had risen in 1992 to over 28,000 cases (Treacy, 1995).

Hoctor (1989) provides a clear view of the steps involved in the structured approach used in this case:

1) Each side chooses to be represented by a person knowledgeable in the resolution of construction contract disputes. These agents must have the authority to make decisions and accept settlements in order to move the negotiation process along.
2) The items in dispute are given to these agents for the purpose of reaching a final settlement binding on the owner and the contractor.
3) Items upon which agents cannot reach an agreement are set aside. For these items, parties may mutually choose a neutral third party to decide the matter. This person can either adjudicate the item in dispute or choose a fourth person with greater expertise in the area in dispute for a decision.
4) The resolution of each item is documented, and a contract change administered for each. The contractor and owner are both bound by the results of the agreement.

The advantages of structured negotiation are twofold. On the one hand, negotiations become a formal procedure, in which a centralized structure is created to cope with the dispute. The most important benefit is that people in dispute can control the process. They can establish strict timetables for their agents to reach a settlement before calling for a third party to solve the matter, and the third parties can be limited to the time they have to reach a decision. The agents take every issue in dispute from its definition to a resolution that is incorporated into the contract, identifying and leaving aside only those issues in which they cannot come to an agreement.

The other advantage is that structured negotiations bring knowledgeable participants to the table; a move that generally produces faster results, since the expert agents can draw from their respective organizations all the legal, technical, and managerial information required expediting the procedures and guaranteeing an effective outcome (Hoctor, 1989). In addition, by constantly interacting with experts, parties reduce the risk of having to escalate the problem to a court, where a judge or jury will have a limited ability to comprehend the problems. In short, by understanding underlying interests, managing information, and then allocating time and resources, the experts involved in structured negotiations increase the likeliness to achieve a win/win, non-zero sum solution.

5.7 FACILITATED NEGOTIATIONS/MEETINGS

Facilitated negotiations assume that parties are not always able to communicate their needs and interests effectively. This inability usually results in parties focusing on positions, and viewing the process as something they will either win or lose. Berman (1995) states that parties on two sides of an issue tend not to be objective and open-minded, therefore becoming adversarial and vague in their interactions. Facilitated negotiations propose a way to improve communications by inviting a neutral third party with knowledge on negotiation, who concentrates on the issues rather than on reaching a settlement. The facilitator will refrain from making judgments or recommendations, but he/she will play a key role in facilitating a smooth evolution of the sessions.

Since construction disputes are usually technically complex and involve a large number of documents, parties can easily conceal the reality, by adopting a position of "*convenient listeners*" (Berman, 1995). In other words, parties can be tempted to pay only attention to the things that benefit them. According to Berman (1995), the facilitator can help surpass this barrier by dividing the negotiations into two phases:

1) *Understanding the Issues*: the facilitator concentrates on making sure both parties understand their own claims, as well as those of the opposing party. This clear definition and understanding of issues will prove beneficial when parties engage in the second phase.
2) *Exploring of Alternatives*: With a clear understanding of facts and issues, the facilitator helps the parties develop creative solutions and evaluate the different implications of potential outcomes. They together explore various settlement strategies in search for a win/win outcome.

If after these two phases a settlement is not achieved, new alternatives are explored until the parties decide to forego negotiation and move to a different level of dispute resolution.

The facilitator plays the important role as a channel of communication and a translator of position into common grounds for settlement, in this form of negotiation. For these reasons, the American Arbitrator Association (AAA, 1996) established that agents should have the following attributes:

- A facilitator must be trusted by both parties. He/she must be seen as an impartial, confident viewpoint in the process.
- He/she must have a basic understanding of construction, in order to understand the sometimes-complex issues in dispute.
- Strong communication, social, and listening skills will be needed to provide a proper channel for interaction.
- The agent must have solid organizational skills, to help parties understand and manage the large amounts of information usually associated with construction claims.
- Ideally, facilitators should also have some knowledge of ADR and arbitration, to communicate to the parties the implications of not reaching an agreement under his/her supervision.

It is important to note that the AAA offers a roster of facilitators for construction disputes that have been selected based on meeting these conditions.

Highway Interchange Project

Negotiation played an important role in resolving the change order in the highway interchange project. Looking at the sources of conflict for the highway interchange project, one can see from Section 1.1 that even before the contractor started working on the project, the potential for conflict in this contract was high. The delivery system (Organizational Issue, Structure) of design-bid-build combined with incomplete design, put the participants at an adversarial relationship from the start. Change, variations and uncertainty (Uncertainty, External) impeded the steady flow of work. Ultimately, the incomplete scope definition (Uncertainty, Internal) play the biggest role in defining the conflict as there was a significant amount of work the contractor couldn't plan for. In terms of the possibility of negotiations on the project, the owner and the general contractor had similar interests.

- The Owner wanted the contractor to do extra work.
- The Owner wanted zero impacts to the schedule.
- The Owner/Project Manager wanted to cap their exposed and risk level in the area of schedule and cost.
- Both wanted a fair and equitable settlement.
- The Contracttor wanted quick resolution and payment
- The contractor was willing do the extra work and take on the risk.

For this reason, interest based negotiation was very successful in resolving these disputes, although they could not all be resolved at the jobsite level. Both the owner and the contractor used a combination of a collaborative/compromising strategy (Section 5.3) to reach a solution. As mentioned earlier, the potential to impact other contracts made the schedule an important interest to the owner. This is the reason behind the owner wanting to cap their risk exposure to schedule delays. The milestones and completion date were critical. The issue of cost was secondary to schedule, but also important because the owner was a government agency. For this reason the owner requested a forward priced change order (Section 3.7.7), guaranteeing that this price would hold once it is agreed upon.

When this project was 80% complete, the owner had approved payment of $US 31 million and was still negotiating the rest of the contractor's request one issue at a time. An independent 3rd party was hired by the owner to verify the number submitted by the contractor. The involvement of a 3rd party and the commitment to good faith, interest

based negotiations aided in the development of trust and helped facilitate an agreement. The owner's interests were met as the Contractor took on extra work, more risk, promising zero schedule impacts, in return for fair compensation. By equitably compensating the contractor, the contractor was satisfied and the owner capped their exposure and locked in a budget based on the forward-priced change order.

5.8 SUMMARY

After the Prevention stage, which assumes that conflicts will exist and attempts to minimize them, negotiation is the first stage that directly tries to solve the disputes. As the second stage in the DRL, negotiation is a flexible stage in which parties have a high degree of control over the possible outcomes. Thus, negotiation is considered the most important tool available to manage and resolve construction disputes, and therefore should be included as a standard resolution technique in contracts. Negotiations may involve a third party facilitator that focuses on communication and development of common grounds. The facilitator concentrates on the needs/interests of each party rather than positions, and attempts to reach a non-zero-sum, win/win outcome that takes into account matters internal and external to the contract that cannot be considered in the binding stages of the DRL.

Step, Structured, and Facilitated Negotiations are three important techniques that can be used throughout the negotiation process. The first two focus on the importance of organizing and structuring the negotiation process in order to improve its results; the third, focuses on the importance of facilitating the communication process among parties. Step negotiation establishes a linear process for dispute resolution, assigning time limits to each level of the parties' organizations, moving upward along the hierarchy in the negotiation process. Structured negotiation offers a formal procedure in which a centralized structure is created to cope with the dispute, while allowing parties to maintain control over it. The introduction of a participant with knowledge in the field lets structured negotiation produce faster results, preventing disputes from escalating and reaching litigation. This technique forces each party in a project to use all the resources available to elucidate the problem before raising the matter to the next step. Finally the facilitated negotiation/meeting is based on the notion that parties are not able to communicate, and thus views the role of the facilitator as a vehicle to improve communication in order to achieve an acceptable solution.

Depending on the objectives, strengths, and weaknesses of each particular project, parties can decide which of these strategies to use. If lack of structure is a main weakness of the project, step and structured negotiations might be the most helpful approaches to solve the conflict. If lack of communication and understanding between the parties is the main obstacle in the dispute resolution process, facilitated negotiation can become a valuable tool. Mediation and conciliation, which are reviewed in Chapter 7, are also forms of facilitated negotiations.

The following chapter reviews the role neutral third party agents can play in the resolution of the usually complicated disputes in construction projects. Similar to the initial determination by the design professional in the traditional DRL, which provides a fast, objective, and knowledge-based solution, these third party agent techniques can aid solve technical and contractual problems and allow the team to concentrate on completing the project. Decisions suggested by the third party experts can also facilitate negotiations and foster the settlement of disputes.

5.9 POINTS FOR DISCUSSION

5.1 What is 'positional bargaining'? What is 'needs-based' negotiation? Are these negotiation styles adversarial or collaborative? What different types of outcomes usually result from these strategies?

5.2 Negotiations are often complex and tense situations. What are the consequences of a party that will not compromise or collaborate? Do the parties have to enter into negotiations only under good faith?

5.3 What are the major advantages of Structured Negotiations (Section 5.6)?

5.4 Who should be directly involved in the negotiations? What role should they play? How effective are Step Negotiations (Section 5.5) if there are "weak links" in the steps, in terms of personnel? By involving more people does the process become more or less efficient?

5.5 Step Negotiations (Section 5.5) assume that personnel at the lowest level have the authority to make critical decisions. What are the ramifications if the upper echelon disagrees with their decision? Does these implications intimidate the initial personnel to aviod making a decision?

5.6 Negotiations, concurrent with DART, focuses on aligning common interests between the two parties. In what atmosphere is resolution most likely, competing, avoiding, compromising, accommodating, or collaborating?

5.7 Negotiation has become an essential skill in the construction industry. Should this negotiation training be a requirement for a large-scale project, or part of a partnering agreement? Would this avoid Facilitated Negotiations/Meetings (Section 5.7)?

5.8 Negotiation theory suggests that parties should not settle for any thing less than their BATNA (Section 5.4). Does this mean that all cases will precede to litigation as suggested in these zero-sum situations?

5.9 A controlled structure and a forum for knowledgeable individuals are the major advantages in structured negotiation. What are some additional advantages?

5.10 In most cases, the outcome of non-binding negotiation is not permissible in following litigation? Is this just? What are the implications? Does this allow for negotiators to be more open in order to reach an agreement?

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CHAPTER 6

STAGE 3: STANDING NEUTRAL

"...experienced and trusted construction professionals with appropriate technical background to address prevention and resolution of disputes"

(ASCE, 1991).

For the construction of a $187 million state-of-the-art Land Level Transfer Facility in the Northeastern United States, an Owner entered into an agreement with a design-build Contractor. The facility was constructed for a subsidiary of a major defense Contractor and replaced an aged facility to increase production capacity and capability. Upon refusal of the first design-build Contractor to complete the final design and construction phases of the project, the Owner subsequently entered into an lump sum agreement with a new design-build Contractor. The new Contractor has claimed substantial damages arising from inaccurate representation of marine subsurface conditions as reflected in the preliminary design performed by the defaulting Contractor.

In the agreement between the Owner and the Contractor, no specific representations were made regarding the site conditions. In fact, the scope of work in the agreement spells out a design-build contract based on detailed performance criteria outlining the general

CHAPTER LOOK AHEAD

WHAT IS IT? A neutral third party is incorporated into the project to evaluate and resolve disagreements, when and if they arise. They aim to provide objective and unbiased feedback by a knowledgeable professional in a timely matter.

WHO IS INVOLVED? These neutral third parties include Neutral Advisors, Owner/Agency Review Boards, Dispute Resolution Boards, and On-call Contractor to name a few. Although there are many variations of a neutral third party, they all have the same objectives.

WHY IS IT IMPORTANT? The capacity of the design professional to provide unbiased feedback was undermined by his/her relationship with the owner. The Standing Neutral stage in the DRL was introduced to substitute the design architect/engineer, with the aim of providing the parties with the possibility of resolving conflicts with a neutral and unbiased professional.

HOW TO APPROACH IT? Review the relationships among the participants previously presented and understand their objectives. Apply this knowledge to the desire to resolve disputes in a timely, efficient manor, while still having control over the outcome. Assess the pros/cons for each of the neutral third party options. Select an appropriate third party neutral DART.

KEY CONCEPTS

configuration and characteristics of the facility, but the representation of the site conditions is clearly not established. It does however contain a clause that provides for an adjustment in price and/or performance period should the Contractor encounter unknown surface, subsurface or latent physical conditions at the site differing materially from the information provided by the Owner.

A third party neutral was retained by the insurance carrier's counsel to assist in analyzing the alleged design errors and misrepresentation of subsurface conditions resulting in the claimed damages. These damages, which exceeded $50 million, represented additional direct work, project delay and other consequential losses. Since this is a design-build contract, there is not an independent designer or Owner's agent to make a determination.

This case raises important questions such as, what services might the neutral provide? What are the reasons for the insurance company's selection of an independent report? Is this type of analysis a reality check for both parties? Although the recommendations are not binding among the parties, what affect might they have if the conflict escalates?

6.1 NEUTRAL ADVISOR

The neutral advisor is actually a mediator with technical know-how, hired by the parties to help resolve problems before they escalate to complex disputes. According to the CPR Institute for Dispute Resolution, this advisor is a *"pre-selected neutral to serve the parties as a dispute resolver throughout the construction process"* (Cronin-Harris, 1994)[1]. The neutral advisor or on-site neutral, as it is also known, is jointly chosen by the parties based on his/her experience in that particular type of construction project.

As the job begins, the neutral advisor becomes familiar with the plans and specifications of the project by reviewing the documents and attending project meetings that take place during the course of the job. When conflicts arise, the on-site neutral can gather the parties to work out solutions. The neutral advisor does not make decisions for the parties or impose final solutions. Instead, they work with the parties to develop an agreeable settlement for all stakeholders, looking for a win-win solution to the arising problems. The costs of the on-site neutral are usually shared equally by the major parties to the job, with no changes in the contract price.

The neutral advisor can be understood as a party taking the place of the architect or engineer in the DRL. If properly implemented, the neutral can provide resolution advice with regards to actual disputes, but the parties can also use them as a consultant for number of activities. This includes analysis of potential problems before they become disputes, guidance in the interpretation of certain contract documents, and in general, advise the parties on any subject for which they require an opinion from a third party to help them arrive at a decision. In their role as a consultant, the neutral advisor can help with early identification of possible sources of conflict, serving as an important figure in the prevention of disputes.

The Neutral Architect, a variation of this concept of the Neutral Advisor, has been successfully developed to address post-construction disputes in merchant housing projects (Kemp, 1998). In this type of project, each individual home owner usually identifies problems for what they consider to be defective work after the homes are delivered and requests from the developer their immediate correction. Some of these requests are accepted by the developer as being part of the guarantee or within the scope of work, but others are disputed as being beyond what was "sold" to the homebuyer. Additional problems arise when work has to be scheduled and performed inside occupied units. According to Kemp (1998), these conditions make litigation between developers and homeowners associations (HOA) a likely outcome. The use of a Neutral Architect

would centralize, organize, mediate, and resolve all of the requests and disputes over corrective work, therefore reducing conflict.

The developer and the HOA select this Neutral Architect jointly, once the project is completed and the requests have been collected by the HOA. Both parties should cover the costs of this neutral to avoid affecting the impartiality of the process. Kemp (1998) described his role as a Neutral Architect in a 95-unit residential project in California as follows:

> *"The primary goal ...was to function as an intermediary between the home owners and the developers in much the same way as a music conductor acts to render a symphony to an audience. The written score and lyric represent the scope of work. The orchestra and choir are the builder and subs. The task is to interpret the scope of work so that both the composer and the audience are satisfied with the result; at the same time making sure that the musicians are team players from the beginning to end"*

As the Neutral Advisor described above, this architect learns about the project, the scope of work, and the disputes between the developer and the HOA and provides parties with unbiased and knowledgeable solutions to their disagreements. This allows the corrective work to proceed much faster and with significant savings for both parties.

Kemp (1998) suggests that the success of this DART approach is based on the fact that the Neutral Architect represents to the parties the "*ideals of impartiality and fair dealing*." Impartiality allows this neutral to overcome the limitations that a design professional, working directly for the owner, would normally encounter; thus, moving the negotiation and resolution of the problem beyond the distrust and the adversarial stance which often characterize the relationship between the developer and the home owner.

In reviewing the many positive contributions of the Neutral Advisor to the effective resolution of conflict, parties to the construction must also take into consideration the disadvantages and risks of this procedure that need to be monitored, which has been summarized as follows:

- The decision is not binding to the parties. Therefore, disputes can continue to affect job performance if a solution is not reached.
- The neutral might become "too" familiar with the job and the different parties to the point that his decisions will no longer be respected.
- A Neutral Advisor that is not educated or inexperienced in making the proper decision may hinder relations.
- The neutral over time might become partially biased towards one of the parties of the construction team.

6.2 OWNER/AGENCY REVIEW BOARDS

Some public owners with large and long duration projects, like the Corps of Engineers in the US, have established in-house review boards to hear disputes that cannot be resolved at the site level. The Board is usually composed of senior officials of the public agency with authority to make determinations on contract matters. It reviews either unresolved issues with the contractor or appeals of decisions of the contract representatives; moreover, the Board attempts to resolve these issues with the contractor in a simple and informal atmosphere.

Another form of application of this technique has been implemented by the City of New York, which established a City Dispute Review Board in 1990 to review and settled

claims and disputes with contractors working for the city. This Board is composed by three members appointed by the Office of Construction with binding authority to issue settlement for disputes submitted by contractors against the city. This Board functions as a permanent arbitration panel.

Advantages of these Owner Review Boards include a second opportunity to review with the owner unfavorable decisions made by the on-site representative, and the low costs imposed on the contractor. With this DART, however, there can be a problem over the partiality of the Board, since its members are employees of the owner and the contractor has no representation. Due to this problem of partiality, the New York City Dispute Review Board has been severely criticized by building organizations (Treacy, 1995), which see the binding effect given to the decisions as an unacceptable feature in this application of this technique, considering the composition of the Board.

In the same way that the Neutral Advisor was introduced to ameliorate many of the limitations of the design architect/engineer, the Dispute Review Board discussed in the following section attempts to solve the limitation of the Owner/Agency Review Board associated with its compromised objectivity.

6.3 DISPUTE REVIEW BOARD

Dispute Review Boards (DRBs) play the same role of the individual Neutral Advisor reviewed in Section 6.1, but in the form of a panel which utilizes *"...experienced and trusted construction professionals with appropriate technical background to address prevention and resolution of disputes"* (ASCE, 1997).

This definition by the American Society of Civil Engineers (ASCE, 1997) incorporates two important ideas that are the basis of the success of this DART approach:

1) Since construction disputes are usually technical rather than legal, construction professionals should be involved, and
2) These experts should be involved to prevent as well as resolve disputes.

The roots of the DRB can be found in the traditional role of the architect/engineer as the owner's representative and in the arbitration panel. The design professional had been the logical dispute resolution agent for the construction industry. However, because their independence is no longer taken for granted as projects and disputes have become larger and more complex, this notion of an independent and technically qualified board has developed as an alternative. The idea of having a Board rather than a single individual comes from the arbitration panel, which encourages unbiased recommendations from the experts by providing a system for 'checks and balances'. The inherent objectivity of the DRB reduces the limitation of other DART, such as the design professional and/or the Owner/Agency Review Board.

The DRB comes into existence by agreement of the parties at the beginning of the project and usually the costs are shared equally between the owner and the contractor. Usually, it is composed of at least three members, two of which are chosen by each party to the contract, while the third member is appointed by the first two. During construction, whether or not there are any disputes, the Board visits the site and meets with the site representatives of all parties, owner/employer, main contractor(s), sub-contractor(s) and, if necessary, important suppliers of goods to the project. The Board may also attend monthly job meetings, depending on the initial agreement between the parties and the level of involvement desired.

Through these meetings and regular site visits, the Board develops a good understanding of the project, its progress, and the parties involved in the contract. *"This real time*

knowledge of the project's progress provides, an understanding that is nearly impossible to recreate during arbitration or litigation once the project is finished" (Kane, 1992). So, when an actual dispute arises, the Board convenes very quickly to hear and settle it as soon as possible, based on this real time knowledge of the project. The Board can also advise parties on areas or issues with potential to become disputes, so they are addressed and settled before the actual disagreement takes place.

In terms of the results of this dispute resolution technique, ASCE reports *"...that a total of $3.2 billion worth of work was completed or under construction in the period 1975 to 1991* [using DRB], *with 81 disputes heard and none taken to litigation"* (ASCE, 1997), and according to ENR (8/26/1991) similar construction projects without a DRB do not exhibit these same levels of performance.

Contract Dispute Advisory Board (Canada)

The following case taken from the Canadian government shows an interesting modification of the Dispute Resolution Board technique. In 1987 the Ministry of Public Works and Government Services of Canada established the figure of the Contract Dispute Advisory Board to handle and resolve contractual disagreement between the Ministry and any contractor/consultant. The Contract Advisory Board is basically a DRB with non-binding authority to review and recommend solutions to the disputants (Figure 19). This board has three members: one neutral Chairman, one representative of the Ministry, and one member selected by the contractor/consultant. Bristow (1998) reports that the success rate in resolving disputes has been 88 %, especially for large, multi-party and multi-issue disputes, which are common at the Ministry.

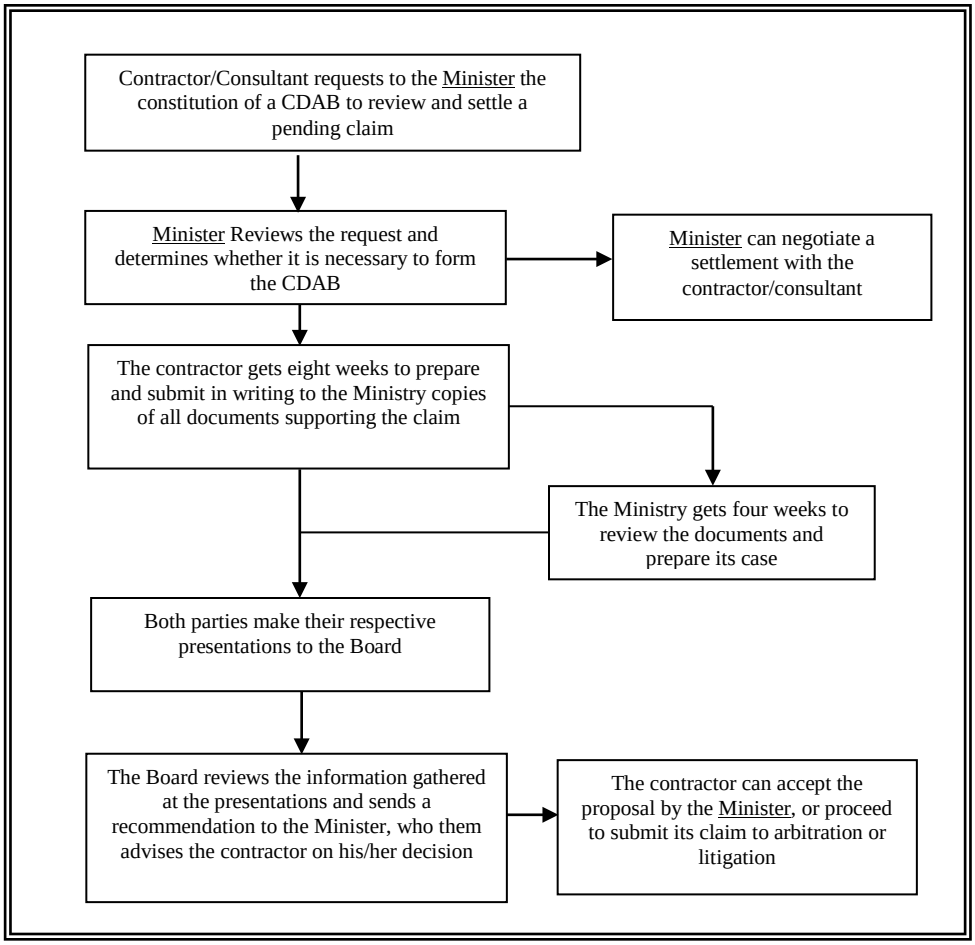

Figure 19 - Contract Dispute Advisory Boards DART Procedure

Five interesting features of this version of the DRB in the Canadian public works sector are worth highlighting:

1) The request to form the CDAB is received and reviewed by the *Minister* of Public Works, and it is through that office that the decision to form the Board is taken. This provides the procedure with the necessary official backing to proceed. Using the Minister also appears to be a last minute effort to resolve the dispute before choosing to form the Board. Officials are encourage to resolve the dispute before they are submitted to the Minister for review, for the same reasons outlined under the ADR technique of Step Negotiations (Section 5.5).

The Board is appointed when a dispute arises, and the Minister chooses to form it. Therefore, the Board only deals with a specific dispute, and it is not part of the whole project. This condition makes this type of Board different than a DRB, which is incorporated into the job from the beginning, regardless of whether there are any claims.

One person from each side is given the responsibility of presenting the cases.

Presentations to the Board are limited to a maximum of two and a half hours for each side. This limitation should expedite the proceedings and limit the amount of evidence presented by the parties. There is no time for expert testimony.

There are no formal rules to run the proceedings, and records of the discussions are kept confidential. This adds flexibility to the process and encourages disputants

to present all the facts, without fear that they will be used in a binding procedure (i.e., arbitration or litigation) if this step fails to achieve a resolution.

These features suggest that the Ministry of Public Works of Canada has in fact combined two techniques from the DRL in the CDAB system. The CDAB is set up as a DRB but operates more like an Executive Trial or Minitrial (Section 7.6). The time limitations and the involvement of the Minister are characteristics that should encourage a faster evaluation and resolution of matters. The Minister has the authority to evaluate and propose alternative solutions to the contractor that the contract representatives may lack.

Despite successful applications of the DRB technique, its main disadvantage can be the high cost of implementation, estimated to be between 0.5 and 1 percent of the construction cost. Therefore, the application of this technique requires an evaluation of the cost implications, for it could represent a considerable investment for both the owner and the contractor. However, in larger-scale and complex projects, this technique has resulted in significant savings in litigation and arbitration costs that surpass the costs of its implementation (ASCE, 1997).

6.4 ON-CALL CONTRACTOR

Another type of project neutral that can help resolve conflicts is an On-call Contractor. As jobs approach the completion mark, small change orders are often necessary to meet last minute requirements by the user. At that time, the main contractor is usually less willing to perform minor change orders and is only interested in obtaining both the completion certificate and the release of the retention moneys. If the contractor is "forced" to perform these change orders, delay claims and additional costs can slow the completion and strain the relationships.

As a way to prevent these last minute confrontations, Zack (a, 1997) suggests that owners proceed to hire an "on-call" contractor to perform these additional work orders. The owner and this new contractor can develop a separate schedule to control these activities, leaving the main contractor free to finish the original scope of work. Special attention should be given to this new contractor, so as to avoid any type of interference with the one finishing the job.

Although this option of the on-call contractor has been included here as part of the Standing Neutral Stage, it can also be considered a Dispute Prevention Mechanism (Chapter 3) since this contractor will actually help prevent last-minute disagreements between the owner and the main contractor. Furthermore, it will increase the chances for a smooth completion and job closeout process.

Land Level Transfer Facility

Getting back to the Land Level Transfer Facility, the insurance company contracted with the neutral to review the claim for its validity as the Owner submitted a claim to the insurance company upon the receipt of the allegations from the Contractor. Two registered professional engineers, familiar with ananlysis of similar construction disputes, undertook the review. The third party neutral provided the following services:

- Review and analysis of geotechnical information contained in the 90 percent design drawings and commissioned reports.
- Comparison of the geotechnical information available to bidders to reported conditions encountered by the Contractor.
- Analysis of entitlement to additional compensation resulting from the alleged changed conditions.

- Verification of costs determined to be compensable and preparation of an estimate to support settlement negotiations.
- Analysis of project progress schedule to assess the alleged impact of the changed conditions and quantification of the Contractor acceleration efforts and supplemental costs.

They produced an expert report on its findings and opinion on the above issues. They asserted that the Contractors claim for damages relating to the alleged differing site conditions did not meet the standard of proof and should have been rejected. In addition, the neutral added that the claim was inflated based on inaccurately reported quantities by the Contractor. This report influenced the positions of both parties and the dispute settled in subsequent negotiations.

6.5 SUMMARY

The Standing Neutral stage is based on a prompt, rational, on-site, and impartial review of disputes by mutually accepted experts. This stage is an attempt to ameliorate the disadvantages of using the design professional, who for years had been used as a neutral and knowledgeable third party. All the techniques proposed in this stage share three common denominators: third party involvement, unbiased decisions, and a knowledgeable expert, all of which promote substantial cost savings and can eliminate inefficient use of time and resources in litigation. Nevertheless, these techniques differ across three different variables: the number of agents involved, the relationship of these agents with the project (i.e., external or internal to the project), and the stage in which they are introduced.

Table 11 - Summary of Characteristics of Different Standing Neutral Techniques

Standing Neutral Technique	Neutral Advisor	Owner Review Board	Dispute Review Board	On-Call Contractor
Number of Agents	1	Multiple	Multiple	1 company
Relationship of the agent with the project	External	Internal	External	External
Stage in which the agents become involved	From the beginning of the project	When conflicts arise	From the beginning of the project	Towards the end of the project. Before conflicts arise

The different levels of each of these variables offer several advantages and disadvantages. The introduction of only one agent has the advantage of reducing costs and time, while increasing flexibility in the decision process. However, it suffers the disadvantage of having decisions depend on the interpretation of only one person who might fail to understand the multiple and complex issues involved in a dispute. In the same manner, the introduction of the third party from the beginning of project offers the benefit of an expert who is highly familiar with the project and its multiple facets, who can collaborate not only to resolve disputes but also to address potential areas of problems. This prevention feature of this stage in the Dispute Resolution Ladder is one of its most important benefits. Nevertheless, the third party's familiarity with the project can

result in loss of impartiality over time. This challenge, in combination with the fact that having an expert throughout the project increments the costs of implementation of this technique, represents the main drawbacks of having a third party neutral throughout the complete project.

Finally, the greatest advantage of an external agent is their impartiality, which often translates into greater trust from the parties. However, their strangeness with the members of the project, specially those not involved in their selection, can be a double-edge sword, and result in difficulties establishing trust, and communication among functional project team members; thus, interfering with the possibility of gathering accurate information.

The advantages and disadvantages of the different levels of this stage, and how each of these interact, need to be considered when deciding the most appropriate technique for the specific characteristics of the project. The selection of the standing neutral technique most fitting to the specific project will increase the chances of solving the dispute at this stage or at least promote the clarification of technical issues that will increase the chances of success. This clarification can help parties return to the negotiation table or proceed to a higher stage in the DRL with some of the issues already resolved.

6.6 POINTS FOR DISCUSSION

6.1 What qualifications should a third party, such as a neutral advisor (Section 6.1), possess? When should they be selected and by who?

6.2 What are the differences between a Neutral Architect and a Neutral Advisor (Section 6.1)? In what setting has a Neutral Architect been typically used?

6.3 Is the cost of a neutral (Section 6.1) covered by his/her performance? Does this vary based on the scale of the project?

6.4 What are the major advantages of replacing the designer/architect (Section 2.1.1) with a neutral (Section 6.1) in the DRL? Review the disadvantages list at the end of Section 6.1? Do these differ from the disadvantages of using a designer/architect?

6.5 How does the Owner/Agency Review Board (Section 6.2) vary from the higher levels of Step Negotiations (Section 5.5)? If the board is comprised of the owner's representatives is it really a neutral entity?

6.6 Graduating from the Owner/Agency Review Board (Section 6.2) to the Dispute Review Board (Section 6.3) what benefits are realized? Contrast these benefits with a single Neutral (Section 6.1)?

6.7 What level of involvement in the project should the Dispute Review Board (Section 6.3) take? Should they be involved in prevention of conflicts as well as resolution of claims?

6.8 Taking a closer look at the Contract Dispute Advisory Board (Case 6.1), is this in effect a mini-trial? How does this differ from actual litigation? How is a CDAB structured compared to a DRB (Section 6.2)?

6.9 The inclusion of an On-call Contractor (Section 6.4) in the contract opens the door to questions as to who is responsible for what. Does this clause complicate conflicts or resolve them? What could be done to ensure the latter?

6.10 When should the On-Call Contractor (Section 6.4) come on board the project, in the end or the beginning? What implications might it have if the On-Call Contractor performed all the owner directed change orders?

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[1] © ____CPR Institute for Dispute Resolution, 366 Madison Avenue, New York, NY 10017-3122; (212) 949-6490, www.cpradr.org. This excerpt from "**Construction industry ADR / Catherine Cronin-Harris. -- New York, NY : CPR Institute for Dispute Resolution, c1994."** reprinted with permission of CPR Institute. The CPR Institute is a nonprofit initiative of 500 general counsel of major corporations, leading law firms and prominent legal academics whose mission is to install alternative dispute resolution (ADR) into the mainstream of legal practice.

CHAPTER 7

STAGE 4: NON-BINDING DISPUTE RESOLUTION

"I realized that the true function of a lawyer was to unite parties ... A large part of my time during the 20 years of my practice as a lawyer was occupied in bringing about private compromises of hundreds of cases. I lost nothing thereby – not even money, certainly not my soul"

(Gandhi, cited by Ide, 1993)

A developer and a group of other investors purchased an old apartment building with the intent to convert it into a condominium and sell the units. This 90-year-old building consisted of 41 existing units. The developer assumed the role of a Construction Manager. Various types of contracts were issued to various subcontractors including fixed price, extra work order, cost plus, and unit price. Overall, the developer estimated to make about US$ 6 million worth of repairs.

In doing this work, the developer had to prepare a document required by law called an offering for prospective buyers. A designer inspected the building's current condition and

CHAPTER LOOK AHEAD

WHAT IS IT? Non-binding dispute resolution procedures result in a mutually agreeable solution with the help of a third party. The procedures are still flexible, but more structured than previous stages. Parties can enter the proceedings voluntarily and select the third party by mutual consent. Other times the contract dictates that participants must enter this stage before proceeding up the DRL. This stage includes Mediation, Conciliation, Advisory Arbitration, and various forms of mock trials.

WHO IS INVOLVED? Mediators, Retired Judges and Experts along with the participants, are involved in this stage. Services provided in this stage can be done by organizations such as the American Arbitration Association and the International Chamber of Commerce.

WHY IS IT IMPORTANT? This stage allows for one last attempt at reaching a solution with the participants still able to have control over the outcome. Flexibility over the outcome is the major advantage. Awards are not based solely on monetary awards. Costs start to become an issue, although they are still significantly less than litigation.

HOW TO APPROACH IT? Understand the significance of non-binding. Choose the appropriate non-binding DART technique based on the individual project circumstances. Follow the necessary processes.

KEY CONCEPTS

the developer then made representations as to exactly what they were going to do to the building. These included the following items: repair the foundation, fix the façade, repair the windows, replace the window frames, and replace the roof. Purchasers bought units based on this document and other beautifully designed marketing brochures distributed by the developer.

The developer completed the work, but the homeowners were displeased with the quality of the units and asserted the developer had not finished the representations they had made in the offering. The homeowners had noticed numerous defects in the construction such as water leakage, code violations, and a poor heating system, but the leakage was the issue that spearheaded the conflict. Poor oversight and a lack of strong management on the part of the developer had led to a haphazard construction program and substandard performance. Some subcontractors cut corners on lump sum contracts to save money while others milked hours on extra work order contracts billed by the hour. The owner caulked the windows, instead of replacing them as stated. Only patchwork was done on the brick and where it should have been repointed. A cheaper roof was used and placed over two existing layers, varying from the offering and violating state building codes.

In trying to resolve these issues, each participant took a hard position. On the developer's side, they felt that because they spent the US$ 6 million budgeted to improve it, that they had met their obligations. In addition to this, they asserted that not all of the issues noted by the homeowners stem from what the developers promised, and therefore they cannot do anything about them. In response to the code violations, the developer argued that the building inspector signed off on it. On the other side, the homeowners just wanted it fixed. If it took $1 thousand or $10 million, they did not care as long as all the problems were fixed. Even though many of the issues were the obligation of the developer, some were not. Subsequently the homeowners association hired an attorney, and made a list of inefficiencies. The lawyers in turn did not look at the obligations of the developer, but got greedy and took the position that they wanted everything and more fixed. They had the attitude that any jury would be sympathetic to a group of elderly senior citizens who were abused by the big bag developer.

The parties are obviously at an impasse. Are the parties committed to resolving this dispute effectively? Consider both of the positions, should either one of the participants make concessions in order to reach a solution? What affect did the hiring of lawyers have on the negotiations between them? How might a non-binding third party make each party see the other side? Who should pay for a third party if needed?

7.1 IMPORTANCE OF NON-BINDING PHILOSOPHY

The Non-Binding Dispute Resolution Stage is the last phase in which the parties still have control over the outcome of the dispute and can participate in the development of an agreeable settlement in conjunction with a third, neutral party. In the next two stages, Binding Dispute Resolution and Litigation, all decisions reached by the third party will be mandatory and will imply strict procedures and rules for their implementation. The non-binding dispute resolution stage has become popular as it facilitates the meetings of the parties, approaching them to a non-zero sum result. Procedures are still flexible, and parties can still enter the proceedings voluntarily and select the third party by mutual consent.

The increasing importance of non-binding dispute resolution methods is supported by a benchmark survey of 200 of the top 500 design firms in the US, conducted by the Johnson & Higgins Construction Group with the aid of Arthur Andersen (ENR, 1/15/1996). This study showed that engineering and design firms that use at least one of

the three risk management programs (Total Quality Management, DART, or Partnering) had the lowest professional liability losses and insurance premiums in the industry. Based on this study, firms with a TQM program have 31% lower professional liability losses than those that do not. Those using DART have 19% lower losses, and firms with formal partnering programs have 10% lower losses than those that do not.

These results support the efforts put forward by DPIC Cos. Inc., of Monterey, California, to promote the use of DART among the 7,300 design professionals it insures in the US and Canada (ENR, 7/11/1994). Since 1991, DPIC has been encouraging the use of formal mediation program called "Mediation Works!" to resolve disputes by offering policyholders a 50% reduction (capped at $12,500) in their deductible for claims resolved using DART. The rationale behind the offer is that the program will reduce legal and settlement expenses by preventing the *"inevitable conflicts, which arise* [in construction] *from becoming claims and lawsuits"* (Hunter *et al*, 1995). [1]

"Mediation Works!" has been a total success. During its first three years, DPIC reimbursed a total of $4.3 million in deductibles to its clients, yet it was able to lower its average legal expenses per closed claim from $22,000 to less than $18,000, and its average loss per closed claim from $116,000 to $103,600. In 1993 alone, DPIC reimbursed a total of $1.8 million on 236 claims (ENR, 7/11/1994). Simple calculations can help understand the economic benefits of this program for DPIC:

Table 12 – Insurance: Mediation Costs/Benefits

Average savings in legal expenses per claim:	
from $ 22,000 to $18,000	$ 4,000
Average savings in losses per claim:	
from $116,000 to $103,600	$ 12,400
Total average savings by DPIC per claim through mediation:	
$ 4,000 plus $ 12,400	$ 16,400
Total reimbursement costs of deductibles to clients: (1993)	
$ 1.8 million in 236 cases	($ 7,630)
Average net savings for DPIC per claim	$ 8,770
Average total net savings for DPIC in 1993	$ 2.0 million

Thus, in 1993 DPIC spent $1.8 million dollars in the implementation of "Mediation Works!," but was able to save a net average of $2 million dollars in legal and settlement expenses, a 100% return on investment. Although these calculations do not consider any direct costs associated with the implementation of the program, the benefits are large enough to understand its success. Since 1991, the percentage of DPIC clients using mediation in disputes has grown from 10% to 29% in 1995, and some local offices of DPIC report that 40% of their cases are being mediated (Hunter *et al.*, 1995).

7.2 MEDIATION

Construction attorneys generally perceive mediation to be the most effective approach for achieving a wide range of goals, such as enhancing parties' understanding of disputes,

opening channels of communication between disputants, minimizing future disagreements, and reducing the cost and duration of dispute. In fact, mediation typically requires relatively less money and time. The American Arbitration Association stated that nearly half of the mediations reported to them are conducted in two days or less and fewer than 10% take more than six days (Macneil *et al.*, 1994). More than 50% cost $3,000 or less, and fewer than 10% cost more than $20,000. The mediator is the figure that aids parties in achieving these goals by promoting an open discussion of the facts that have lead to the disagreement while serving as a guide for clear and honest communication. This approach is crucial for the mediation process, specially considering that this DART could be the last step prior to the Arbitration or Litigation stages, which often results in a win-lose resolution.

An important aspect of mediation is that parties must be able to understand both sides of the problem to develop a non-zero sum solution. That is precisely why pre-hearing statements include 1) a narrative of the facts to let the mediator understand the background of the dispute; and 2) a description of each individual dispute with facts, contractual provisions, issues of law, and damages. Procedures then continue with an exchange of statements between parties and the mediator, something that allows sides to determine if they are mediating the same dispute.

The exchange of statements usually starts with all parties meeting jointly in a caucus with a mediator. Being a skilled communicator and interpreter, this third party neutral is capable to quickly identify the strengths and weaknesses of the case at hand. During the meeting, each party's advocate is asked to present a brief summary of their case. The mediator then recaps the presentations and the parties break up for individual meetings with the mediator. The private caucuses have three objectives:

1) They allow parties to reveal things they did not want to state in front of the adversary.
2) They provide a space for the mediator to 'play devil's advocate' and present new scenarios.
3) They allow each party to realistically assess settlement possibilities and opportunities.

The mediator then goes back and forth between the parties in an effort to develop an acceptable settlement for the dispute. Throughout the process, a mediator plays the role of a facilitator, a translator of the positions each party wants to explore without formally committing to them. In a way, mediation is simply an extension of a negotiated settlement, but one in which confidentiality is maintained throughout the process, and an offer is not such until it is made through the mediator.

The AAA (AAA, 2000) summarizes some of the benefits of mediation as follows:

- *"Reduces the hostility between the parties and helps them to engage in a meaningful dialogue on the issues at hand;*
- *opens discussions into areas not previously considered or…developed;*
- *communicates positions or proposals in understandable …terms;*
- *probes and uncovers additional facts and the real interests of parties;*
- *helps each party to better understand the other parties' views and evaluations of a particular issue, without violating confidences;*
- *narrows the issues and each party's positions, and deflates extreme demands;*
- *gauges the receptiveness for a proposal or suggestion;*
- *explores alternatives and searches solutions;*
- *identifies what is important and what is expandable;*

- *prevents regression or raising of surprise issues; and*
- *structures a settlement to resolve current problems and future parties' needs."*

Another significant and often overlooked aspect of mediation is that not all cases settle for monetary damages. In mediation parties can agree to numerous social and/or monetary obligations and commitments that can meet the needs and interests of all the parties; opening the door for win-win solutions. For example, a contractor may agree to settle a dispute by performing additional work at cost. In contrast, courts can only provide limited types of settlements, which often reduce the options available to the parties such as money damages, injunctive relief, and declamatory judgments.

Mediation is a flexible technique and its only role is to guide parties towards dispute resolution. A mediator has no binding authority to render decision on any matter. For this reason, real zero-sum disputes are not to be handled through mediation and neither should constitutional issues or any case in which legal precedent must be set (Meyer, 1995).

The characteristics of mediation have allowed this technique to gain popularity in the United States as an alternative to arbitration and litigation. The 1997 edition of the American Institute of Architects' construction contract forms recommends mediation to solve disputes before arbitration can be pursued. Similarly, the new standard form of agreement and general conditions between the owner and contractor for lump-sum projects of the AGC includes *"...a menu of alternative dispute resolution [which] starts out with direct discussions between the parties and then moves to mediation"* (ENR 2/14/1998). The reasons for this popularity are well founded. Meyer (1995) estimates that timely mediation can save 80% of court and counsel costs, and *"...[C*onstruction*] industry studies indicate a 90% success rate [*for mediation*] in resolving disputes"* (ENR 2/14/1998). This is mostly because of the fact that mediation offers a contextual alternative to litigation without compromising any side's strategy or real interests. This data puts mediation in a competitive advantage against other methods of ADR.

A joint effort by Cornell University, Price Waterhouse, and the Foundation for the Prevention and Early Resolution of Conflict (PERC) established the differences between mediation and arbitration (Table 13) as ADR mechanisms. The comparison is based on the views expressed in a survey by legal counsels of large US corporations.

Table 13 - Mediation and Arbitration Differences (Lipsky et al., 1997)

MEDIATION	ARBITRATION
Predominantly triggered by parties.	Predominantly triggered by contract.
Widespread experience with the process.	Slightly less experience with the process, although still widespread.
Used in most types of disputes.	Used in a narrow set of disputes.
Extensive growth expected.	Growth will be limited if at all.
Parties perceive gain in process control.	Parties uneasy about control of arbitration.
Wide variety of sources for mediators.	Arbitrators come primarily from private providers.
Some uneasiness about qualifications of mediators.	Less confidence in arbitrators.
Used in almost all industries.	Usage in some industries much higher than others.

Despite some obvious benefits like a general applicability to different industries, the international community has only recently began to recognize formal mediation procedures as an important tool for businesses. Analyzing the case of the United Kingdom, it results evident that their use of mediation is still very limited compared to the US. The two largest British providers of mediation service (ADR Group and CEDR) each handle between eight and ten mediations per month or a total of 120 per year, by contrast, JAMS/Endispute, Inc., the largest US ADR provider, handled 17,000 cases in 1995 (Coates, 1997).[2] Although these results do not specifically relate to construction, they help illustrate the different levels of implementation of mediation in these countries.

In spite of its late-entrant status, the UK does provide a helpful international example of the different applications of mediation in construction. Analyzing British engineering cases, Gould *et al.*,(1998) identified a varied spectrum of mediation styles within the UK construction industry. It included informal, facilitative (or facilitated), institutionalized, and evaluative mediation (Figure 20).

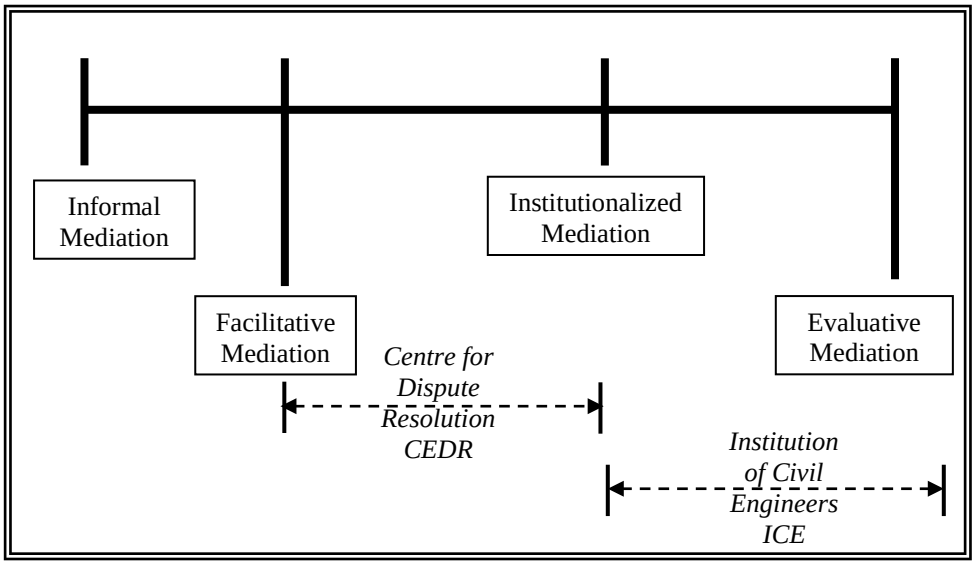

Figure 20 - Spectrum of Mediation Styles in use within the Construction Industry in the United Kingdom

In informal mediation, one of the parties incorporates a third party in an effort to begin/resume the negotiations, or break up a deadlock. This technique is commonly used in many dispute resolution processes, and sometimes the mediator is a common acquaintance or a recognized professional within the industry. Thus, sometimes all that it takes is a telephone call or brief intervention for the "mediator" to reestablish the talks.

In facilitative mediation, the third party mediator helps parties communicate and exchange information, but refrains from issuing an opinion as to the interests or a possible settlement. The mediator is not an arbitrator, and they have no power to impose a solution upon the parties. The role of the mediator is simply to promote communication, identify common grounds between the parties, and mediate a settlement.

Institutionalized mediation is in fact a facilitated mediation that is formally administered by an organization dedicated to ADR. With the increasing demand for mediation in the UK, private organizations like the Center for Dispute Resolution have been established to provide, manage, and organize mediation procedures. An advantage of institutionalized

mediations is the expected improvement in the qualifications and expertise of the experts and third party neutrals.

The last style of mediation in the spectrum identified by Gould *et al.* (1998), evaluative mediation, occurs when the third party neutral, in addition to developing a common ground for the settlement, also issues an opinion as to possible settlements based on the information developed through the proceedings. In other words, if parties fail to mediate a resolution, the mediator issues a recommendation on the case.

Another illustrative example of international applications of mediation of construction disputes is found in Japan. In this case, the Japanese Construction Business Act requires that construction contracts oblige the parties to address the following issues and include them in writing in all construction contracts:

1) *"How to deal with changes in construction schedule or contract amount, or sharing and evaluation of loss where construction is changed or postponed or canceled;*
2) *How to share and evaluate losses in case of Acts of God or other force majeure events;*
3) *How to address changes in contract amounts or construction scope due to changes in materials or services;*
4) *Sharing of the liability for damage to third parties;*
5) *Interest, penalty and other damages in case of delay in performance of contractual obligations and other liabilities; and*
6) *Method of dispute resolution."*

(Fenn *et al.*, 1998)

What Japanese authorities have identified is that, in the past, failure to include these elements in a construction contract has usually led to unnecessary disputes.

> *In regards to the Japanese common procedures, both public and private contractual forms in Japan generally include one of two types of dispute resolution procedures [Figure 21]. In procedure* ***A****, both parties agree to solve their disputes through a third party intermediary designated in the contract, using either mediation or conciliation. If parties fail to reach a settlement, the dispute is brought to the Construction Disputes Resolution Committee (CDRC), similar to a Dispute Resolution Board. In procedure* ***B****, disputes are presented and settled by the CDRC from the beginning of the project, and no party can request arbitration before or during mediation or conciliation, unless there is a joint agreement to that effect.*
>
> (Fenn *et al.*, 1998)

In both procedures, parties can agree to arbitration once the disputes reach the committee. Indeed, the Construction Disputes Resolution Committee was established by the Construction Business Act to provide consultation, mediation and dispute resolution through a number of regional and local committees located throughout the country.

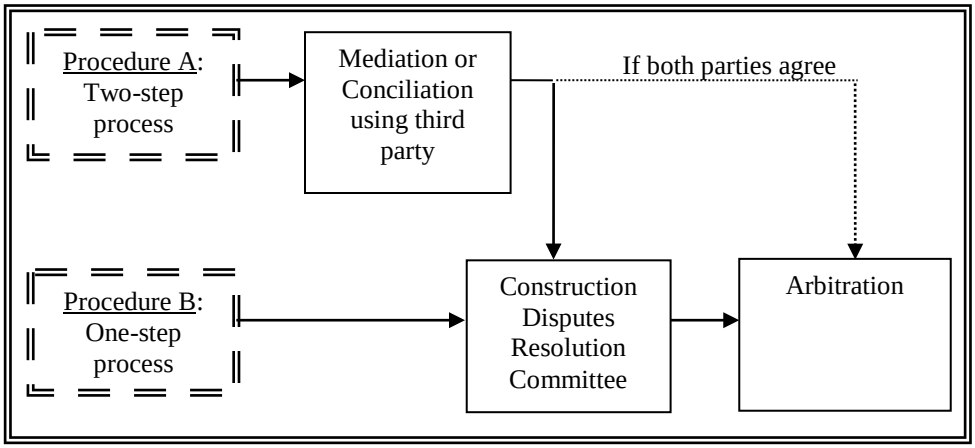

Figure 21 - Dispute Resolution Procedures in Standard Japanese Contracts

In summary, the British and Japanese examples presented above, in conjunction with the examples on the use of mediation in the US, all highlight the multiple benefits of mediation as a tool to reduce the likelihood of advancing towards binding procedures or litigation. Nevertheless, there are some drawbacks to the use of mediation, specifically in relation to the exchange of confidential information, which may expose weak aspects of each case and reveal possible trial strategies. In order to mitigate this problem, parties should include strict limitations on the use of information developed through this non-binding technique in the agreement to mediate. Also, the information provided to the mediator should be classified as confidential, to avoid having it disclosed without approval during the proceedings. This way the mediator still receives all the information to attempt to develop common grounds for settlement, but with the condition that a portion of it remains confidential as long as an agreement is not reached. Another risk of mediation results from its increasing use. Many researchers and experts in the topic fear that as mediation becomes the fallback dispute resolution technique for most construction conflicts, it will lose its flexibility and harmonious nature, being at risk of suffering the same destiny of arbitration.

7.3 CONCILIATION

Conciliation differs from mediation in that the neutral party evaluates the dispute and then issues proposal for the resolution of the dispute that is presented to the parties for approval or rejection. Conciliation's non-adversarial nature attempts to improve business relationships, and the AAA reports that 80% of the cases that attempt conciliation prior to litigation are settled (Langeland, 1995).

In the UK, the evaluative form of mediation previously identified is in fact a conciliation procedure, as the mediator is expected to provide the parties with a written assessment of the dispute and a possible outcome. The engineering side of the construction business has preferred conciliation over mediation, and the Institution of Civil Engineers (ICE) has introduced this technique in their standard form of contract for engineering design work. Moreover, in the most recent Design and Build contract form taken from ICE, conciliation has been included as a mandatory step in the dispute resolution process.

In other parts of the world conciliation also receives important attention. The concept was already a part of New Zealand's "Conditions of Contract for Building and Civil

Engineering Construction" since 1987, in a process that followed some standard steps and rules; among them:

- *"The process is voluntary;*
- *The conciliator mediates between the two parties in order to identify common grounds for a settlement;*
- *All discussions are confidential and information disclosed during the procedures can not be used in other proceedings should conciliation fail to achieve a settlement;*
- *Each party pays half of the costs of the conciliator;*
- *The conciliator may provide a non-binding written opinion as to the case and the probable outcome if the case is resolved through arbitration or court litigation."*

(Hollands, 1989)

New Zealand's version of conciliation also added the following adjustments and refinements to the Mediation procedure:

1) *"Parties have ten working days to agree on conciliation, and choose a third party neutral from the date of the request.*
2) *Once parties agree on using this procedure, and select a conciliator, they have two months to reach a settlement or to have the conciliator issue a determination. After that period, either party is free to proceed with arbitration.*
3) *The decision of the conciliator becomes binding if ten working days pass and no party notifies the other in writing that it rejects the determination. So the non-binding decision becomes automatically binding and final to the parties after the specified period elapses.*
4) *A presiding judge may act as a conciliator if both parties agree to submit the case to him/her in that form. If the procedure fails to produce an agreeable solution, the judge remits the case to another judge for hearings and trial proceedings."*

(Hollands, 1989)

Hollands (1989) comments on these older conditions saying they are "…more practical and helpful..." with regards to outlining and defining the DART for the disputants, than the more recent FIDIC provisions for Amicable Settlement.

7.4 ADVISORY ARBITRATION (NON-BINDING ARBITRATION)

In this non-binding dispute resolution procedure, parties select a third neutral player and then jointly and/or separately present the facts of their dispute. The arbitrator then proceeds to issue a non-binding decision or opinion as to the possible outcome if the dispute were brought before a judge or a jury.

The more complete form of this approach follows all the stages of arbitration, but it includes an advisory opinion for the parties as the final award. This procedure is known as Advisory Arbitration or Non-Binding Arbitration, and it can be an efficient way to put the parties in a position to evaluate a likely outcome of binding proceedings and provide them an opportunity to negotiate a settlement.

The procedure is very similar to a Mini-Trial (Section 7.6), with the benefit that the parties have an opinion from a neutral third participant. It could be said that the advisory arbitration is actually arbitration in every sense, except that it does not bind the parties

into accepting the decision of the neutral. Furthermore, the presentations and the procedures are relatively simpler than those for formal arbitration. Thus, this voluntary negotiating tool can be easier to practice and more relaxed than the binding arbitration.

Together with some other DART like mediation and conciliation, this approach can be of great help in complex disputes that combine technical and legal matters. Non-binding arbitration can provide the framework for the fact-finding effort and the exchange of information between the parties, while mediation can provide the communication and cooperation tools required in developing a settlement. Again, because these procedures are not binding, parties have more flexibility in defining and changing the role of the third party based on the specific requirements and characteristics of the dispute. This notion is supported by Beresford Hartwell (1998), who argued that in order for success to occur; alternative dispute resolution procedures cannot always be confined to a readily specified task:

> *"A mediator for example may need to have some ability to ascertain facts and to ascertain them without having to rely entirely upon the parties, whose objectivity is likely to be coloured. A fact finder may need some powers of persuasion. Rigid categories and restrictions may well be an obstacle to a realistic settlement" (Beresford Hartwell, 1998).*

A simpler form of non-binding arbitration is known as the Advisory Opinion. It is very similar to a Neutral Advisor (Section 6.1), except for the fact that the third party is not incorporated into the project from the beginning. In other words, the neutral party only starts to play a role when a dispute arises and parties decide to request an outside opinion. Groton (1997) suggests this arrangement can bring disputes closer to reality, as the neutral view encourages parties to focus on the issues and deal with the disputes before they evolve into something larger with greater mutual implications.

7.5 FACT-BASED MEDIATION

This form of DART is a combination of Advisory Opinion and Mediation. When parties agree to use this approach, they select a mediator who proceeds to conduct a complete assessment of the facts and issues in dispute between the parties. The mediator analyzes each party's point of view and reviews all the evidence and documents generated by the case. Once this information is processed, the mediator issues confidential and detailed reports to each party, where he/she outlines the potential costs of litigation, the probable outcomes of a suggested binding procedure, and a settlement recommendation for the case (Groton, 1997).

An interesting feature of this non-binding procedure is that each report given to the parties is different from the other, except for the "bottom-line, dollar recommendation" Groton (1997). The mediator does not provide a unique solution for the disputes, but he/she explores in each report to the parties possible alternatives for a settlement. The dollar settlement is common for it is part of the mediator's assessment of the probable outcome if the dispute is taken to a binding procedure.

After this point, the mediator has hopefully been able to identify common grounds for a settlement, and he/she can proceed to mediate the talks between the two parties. The mediator retains the capacity to issue new recommendations and opinions via separate reports as the negotiations move forward. The mediation aspect of this procedure involves the same techniques described in Section 7.2.

7.6 MINI-TRIAL OR EXECUTIVE TRIAL

As all the other DART approaches mentioned in this chapter, the Mini-Trial is a voluntary, private, non-binding procedure that helps senior management understand the issues in dispute, assess the risks of proceeding with a binding approach, and hopefully negotiate a settlement agreeable to all parties.

In 1991 the American Bar Association defined this DART approach as follows (cited by Stipanowich, 1996):

> *"Mini-Trial is a private process in which counsel for the opposing parties present their cases in condensed form in the presence of designated representatives for each side who have authority to settle the dispute. Usually, an independent and impartial third party "advisor" is also present. After the presentation, the parties' representatives meet to discuss settlement prospects. At some point, the third party advisor may offer certain non-binding conclusions regarding the probable adjudicated outcome of the case and may assist in negotiation"*

Groton (1997) also defines the Mini-Trial as *"... a brief presentation of each side's 'best case' arguments in the presence of principal executives of both parties, whose efforts are usually facilitated by a third party neutral,"* offering a simpler explanation to the procedures involved in this non-binding and conciliatory technique.

The advantages of this approach are the achievement of non-binding results, an effective mutual participation, guaranteed privacy, and an overall control over the process. Additionally, this system is relatively cheaper than litigation or arbitration, even though proceedings are carried out as if the case was being presented in front of a court or arbitration panel. This makes it possible for managers to assess the strengths and weaknesses of their case and those of the opposing party, facilitating the decision to develop a settlement proposal.

The role of the third party neutral in the Mini-Trial is critical as in the other cases, since they are responsible for providing both parties with a thorough assessment of each case. Only then can they truly help the parties develop a solution acting somewhat like a mediator.

7.7 SUMMARY JURY TRIAL

A variation to the Mini-Trial is that instead of having company executives as the members of the panel parties, should include professionals with expertise in the specific field in dispute. This panel would resemble a Dispute Review Board (Section 6.3) in terms of the knowledge and neutrality of its members, with the difference that these would be working in front of representatives of both firms with the capacity to accept or reject a resolution. Moreover, the presentations would take place at a stage in the dispute process in which the next available options are binding arbitration or litigation. This alone should encourage representatives to design and accept a resolution based on the presentations.

This alternative dispute resolution method is very similar to a Mini-Trial, with the difference that a counsel from each party makes presentations in front of a "*rented*" jury of six people. Zack (b, 1997) describes the Summary Jury Trial as follows:

> *"Attorneys for both parties are each given 1 hour to summarize their case before a "rented" jury of six people ...After the case summaries have been*

> *presented, the [neutral advisor[3]] provides a short explanation of the law concerning the issues in dispute, and the jury retires to the jury room. The jury tries to reach a consensus opinion on the case. Failing that, individual juror views are presented anonymously."*

Among the advantages of this technique, as outlined by Zack (b, 1997), the one-hour limitation on presentations forces attorneys to focus on the issues and leave aside complex legal issues and irrelevant evidence. This time frame also prevents the introduction of excessive evidence or the use of witnesses and experts, which greatly reduces costs when compared to court litigation. The matter is presented, and a decision is reached, in a matter of one or two days at the most. Finally, an important benefit is that decisions are not binding to the parties, yet they provide management with a valuable insight as to the strengths and weaknesses of their respective cases. This insight might result in new approaches to the negotiation and eventually into a satisfactory settlement.

In a nutshell, the results of this procedure provide disputants with an understanding of *"how a potential jury will react to the case"* (Zack b, 1997) but without actually taking the dispute to court. The non-binding decision of the jury, if reached, can improve the chances for a negotiated settlement to be achieved.

7.8 VOLUNTARY SETTLEMENT CONFERENCE (RENT-A-JUDGE)

In this form of ADR, a retired judge acts as a neutral facilitator/mediator between the two parties during the negotiations. This is a fast and inexpensive approach for parties to reach an agreement under a legal framework, rather than through private negotiations.

The judge or magistrate is selected by mutual agreement of both disputants. Parties are free to select a judge with significant experience in the field of construction, both in managing complex cases and in determining and issuing decisions. The judge's prior experience in construction disputes provides added benefits to this form on non-binding DART. In addition, parties are able to schedule conferences and follow-up meetings with the selected judge without the administrative and/or legal formalities of arbitration or litigation. This characteristic provides for a faster process.

Among the responsibilities of the judge are: 1) running the proceedings very much as a court process; 2) guiding the parties with regards to legal issues in the dispute; 3) suggesting tentative compromises; and 4) issuing advisory settlements subject to approval by the parties (Zack b, 1997). Treacy (1995) reports that in the Eastern District of New York, courts allowed this settlement judge to act as a mediator between the parties, following the procedures described in Section 7.2 to promote communication and develop common grounds in which to build an agreement. In order to maintain confidentiality during these conferences, the information developed through mediation is not allowed in court if a settlement is not reached and the case proceeds to litigation.

Some courts have implemented a similar procedure for pre-trial motions and discovery in an effort to shorten the duration of the actual hearings. These court appointees known as Special Masters or Settlement Judges are appointed by the court to control the discovery process and resolve common pre-trial disputes. In these proceedings, the court is involved in setting the responsibilities of the Master and reviewing the award. The costs of the Master are determined by the judge, who also determines how they will be shared by the disputants. In the Eastern District of New York, this technique has been used in cases, which involved large sums of money, and the dispute is very complex (Treacy, 1995). The Master brings into the proceedings experience in the construction field and usually more flexibility in terms of schedule.

Condo Project

We can see the effect non-binding arbitration has on disputes by returning to the Condominium project. When the homeowners association added a lawyer who adopted a hard position, the negotiations between the parties began to fail. The owner recognized and accepted responsibility for his actions and was willing to meet his obligations, but this was not possible with the hard position taken by the homeowners. To prevent the conflict from escalating to litigation, the developer hired a third party to help develop a non-binding solution.

After reviewing the case and hearing both sides, the assisting third party estimated that upwards of a half a million needed to be spent by the developer to meet his obligation, almost a 10% of the original budget. An evaluation was made of the building and issues were resolved on a case-by-case basis. To bring things into perspective for both parties the third part look at what was promised, what was done and what the current condition of obligation.

After five or six sessions and hours of research by the third party, about $50,000 in billable hours, the parties grew apart. Homeowners wanted US$ 2 million although they said money was not important and they really just wanted it fixed. The developer proposed $500,000 in improvements. Mediation failed. Failure was attributed to the lack of commitment of both of the parties, but more so on unrealistic expectations of the homeowners. As noted in the chapter, commitment from both parties to develop a non-zero sum solution is necessary for a successful outcome.

The case has now proceeded to litigation and both parties have effectively lost control over the outcome. The cost of the third party attempt represents about 1% of the initial budget. Both parties can only hope that attorney and court fees mirror this as the fight has already lasted 10 years.

7.9 SUMMARY

The Non-Binding Dispute Resolution stage is crucial in the DRL, for it is the last voluntary step before the conflict moves to Binding Arbitration and/or Litigation; stages that result in increased use of economic and time resources, and relationship strains. Non-binding procedures are characterized by higher levels of formality when compared to previous stages in the DRL; however, they continue to preserve the flexibility of the outcome, compared with the stages that follow. This chapter reviewed five important techniques that can be used to effectively and efficiently resolve disputes: Mediation, Conciliation, Advisory Arbitration, Fact-Based Mediation, Mini-Trial, Summary Jury Trial, and Voluntary Settlement Conference.

Mediation has gained importance in the resolution of disputes in the last few years. It rests in the following principles: the earlier the dispute is resolved, the less damage it causes; the individuals involved in the dispute are the ones most capable of coming up with the best solution to their problems; the parties involved in the dispute can best preserve their future relationships without resorting to an adversarial process; and people issues may impair the ability to communicate to resolve problems. The use of mediation offers the parties multiple benefits, such as: the ability to remain involved in the negotiation, the chance of having a third party neutral that can aid them develop solutions they might not have considered otherwise, the possibility of arriving to a settlement faster than in litigation, a significant cost reduction when compared to the litigation process, an increased likelihood of safeguarding the relationship of functional teams, and the opportunity for creative solutions and compromises (i.e., win/win).

Conciliation, another non-binding technique, resembles many of the principles of mediation, with the addition that the third party issues a non-binding recommendation,

offering disputants information on the possible outcome if the case continues to arbitration or litigation.

Advisory Arbitration, also known as non-binding arbitration, follows all the standard procedures of Arbitration, yet it includes, as the final award, an advisory opinion as to the possible outcome if the case is presented to an arbitrator. Although this technique pays less attention to helping the parties communicate with one another, the advisory opinion can foster a new stage of negotiation where a settlement can be achieved without proceeding to binding arbitration. Fact-Based Mediation is a non-binding technique that combines the principles of Advisory Opinion and Mediation. The mediator assesses the facts and issues in dispute and then presents a different report to each party, where he/she outlines the potential costs of litigation, the probable outcomes of a binding procedure, and a settlement recommendation for the case. In Mini-Trial, each party presents its case to upper management and to a third neutral party. The presentation of the case helps management understand the issues in dispute, assess the risks of proceeding with a binding approach, and hopefully negotiate a settlement. A modification of the Mini-Trial is the Summary Jury Trial in which the counsel for each party makes presentations to a rented jury. This technique, as well as the Voluntary Settlement Conference (Rent-a-Judge), allows the parties to see how a potential jury or judge would react to the arguments being presented. In both of these two procedures, the parties issue an advisory settlement for approval and acceptance.

In the face of dispute, it would be unrealistic and ineffective to try to apply all of the techniques previously described. As discussed in earlier chapters, parties involved in a non-binding conflict resolution process must think about their needs, objectives, relationship with the opposing party, and the facts of the case before choosing the most appropriate technique. The techniques presented in this chapter can be organized in a continuum (Figure 22), beginning with less formality putting more emphasis on the parties ability to solve the dispute, and continuous effort to achieve a win-win outcome, to increased formality, legal representation, and confrontation between parties. This continuum depicts the trajectory that if followed would lead towards the next stages in the DRL: Binding Arbitration and/or Litigation, if conflicts are not effectively resolved in this stage. Chapter 8 introduces the Binding Stage, addressing both its strengths and limitations, as the last step in the DRL, before disputes proceed to Litigation.

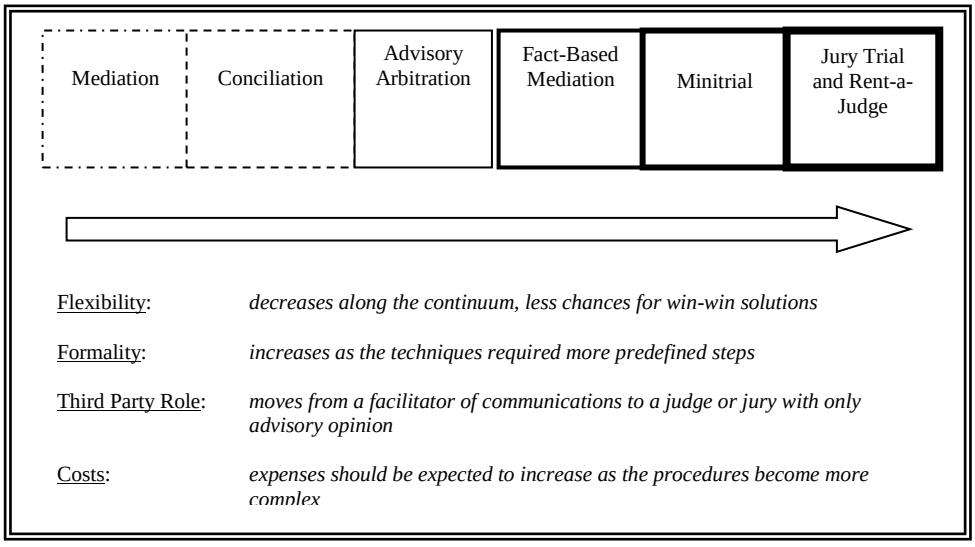

Figure 22 – Continuum of Non-binding Dispute Resolution Techniques

7.10 POINTS FOR DISCUSSION

7.1 In mediation (Section 7.2), what should be the role of an insurance company such as DPIC? What are their interests? Do they have justification to be involved at this stage? Is their presence beneficial to other parties involved?

7.2 What are the major advantages and disadvantages of mediation (Section 7.2)? Compare these with previous DART mentioned in this book. How do they differ?

7.3 Is non-binding mediation (Section 7.2) adversarial or collaborative? Does this stage in the DRL allow parties to change their position as new facts are presented and a better understanding of the situation is realized?

7.4 How important is the idea that not all settlements need be in terms of monetary damages (Section 7.2)? Discuss implications of this concept?

7.5 How critical is the need in the United States for a centralized dispute resolution entity such as the CEDR (Section 7.2)? Should this be a public or private entity or a partnership of both?

7.6 What are the disadvantages associated with conciliation (Section 7.3)? In what situations should this method be used? Is conciliation placed at the appropriate step in the DRL?

7.7 There are numerous variations of non-binding DART. When are there too many? Should it be the responsibility of the owner to select the processes to be used before the bid is awarded, or should they be jointly selected after the award of the contract, before a dispute or after a dispute?

7.8 How valuable is an Advisory Opinion (Section 7.4) to the participants? Might this opinion deter them from proceeding to litigation? Is it more or less valuable depending on the qualifications of the arbitrator?

7.9 Can non zero-sum solution be reached through Fact-Based Mediation (Section 7.5)? Is this 'reality check' a useful step, or does it just add time to the process?

7.10 As we move up the DRL, the technical expertise and construction experience of the selected or appointed neutral seems to decline. What effect does this have on the outcome? How might one participant change their case to appeal to such individuals?

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7.12 ENDNOTES

[1] Although an attempt was made to contact DPIC directly to update the information from the ENR and Dispute Resolution Journal articles, lack of response did not permit any further investigation. However, the programs for promoting ADR were found throughout DPIC's website (www.dpic.com) signaling that the effort continues to be successful both for the insurer, as well as for its clients.

[2] ADR Group (www.adrgroup.co.uk), CEDR (www.cedr.co.uk), JAMS/Endispute, Inc. (www.jamsadr.com).

[3] The neutral advisor is either a retired judge (rent-a-judge) or a sitting judge in order to guide the jurors in the legal considerations of the dispute (Zack b, 1997).

CHAPTER 8

STAGE 5: BINDING DISPUTE RESOLUTION

"The future of arbitration is dependent on a number of factors, probably the most important of which is the quality of the arbitrators available to appoint"

(Crowter, 1999).

A publicly owned water agency that provides service to approximately 175,000 people in the United States undertook a construction program to upgrade an existing reservoir near an urban area. To assure that the water flowing into this reservoir was safe to drink, a diversion facility to intercept and divert poor quality water and contaminants, generated because of urbanization. This US$ 6 million Project consisted of four major components: A Low Flow Barrier and Inlet Flume, a 48-inch Gravity Flow Reinforced Concrete Pressurized Pipeline, a North Side pond and Two Wells and an 8-inch Pressurized Pipeline.

An additional dimension of this Project is the recognition that the site lies in an environmentally sensitive area, and is therefore subject to many environmental

CHAPTER LOOK AHEAD

WHAT IS IT? Arbitration as defined by the American Arbitration Association is *"…referral of a dispute to one or more impartial persons for final and binding determination. Private and confidential, it is designed for quick, practical, and economical settlements."*

WHO IS INVOLVED? The most important part of Arbitration is the arbitrators. Knowledge, skill and experience of the arbitrators heavily influence the outcome. A panel of three arbitrators, one selected by each party and a third selected mutually, is common in the industry. A list of qualified arbitrators by region is provided by the AAA.

WHY IS IT IMPORTNAT? Decisions are impartial, decisions are final and binding on the parties, and decisions are issued by knowledgeable experts in the field in dispute. For these reasons Arbitration has become the most popular dispute resolution technique.

HOW TO APPROACH IT? If a non-binding solution cannot be reached, follow the appropriate steps outlined in the contract to reach a binding decision. Review your contract for the appropriate procedures. If arbitration is the selected option, file the necessary forms and select a knowledgeable arbitrator. Prepare your case relevant to the conflict.

KEY CONCEPTS

constraints. The construction constraints were outlined in the Technical Provisions Specification – Special Environmental Concerns.

> *"The urban runoff diversion system passes through sensitive environmental areas which the construction will disrupt and/or impact. Permits for construction by the Authority and its agents have been issued by the U.S. Dept. of Interior Fish and Wildlife service, U.S. Army Corps of Engineers, and the California State Fish and Game Dept. Permit copies have been included in Appendix B. By submitting a bid for the project award, the Contractor agrees he has read and understands the permits' conditions and these provisions, and agrees to comply with these provisions at all times. …The permitted time constraints are as follows: No vegetation clearing from February 1 to September 30; No work of any kind, form March 15 to July 21; Work activity emitting greater than 60 dBA is not permitted from March 1 to March 15, and July 22 to September 30."*

This contract was a fixed price, publicly issued contract and scheduled to be completed in 480 days after Notice to Proceed (September 11, 1997). The major participants involved in this contract include the owner, a general contractor, and a designer. A pre-bid conference was held to clarify any ambiguities in the design or questions/concerns that the contractors might have. Liquidated damages were set at US$ 1,000 per day.

The contractor proceeded to start the work by widening a temporary access road for equipment and was immediately stopped by the owner. The widening of the road would, which was not in the permits, impacts 35 feet of the environmentally sensitive area. The contractor submitted a delay claim, and they proceeded to arbitration.

This project raises some critical questions. If you were the contractor, would you ask for clarification of the environmental permits at the pre-bid meeting? Should you have a backup plan for construction if your methods are limited by unforeseeable circumstances? How might these environmental constraints affect the construction schedule? What role should the owner play in reviewing the contractor's schedule?

8.1 MEDIATION/ARBITRATION (MED/ARB)

The least adversarial binding DART, Med/Arb, combines non-binding mediation with binding arbitration. In this technique the parties select a mediator and agree that the very same third party neutral will become arbitrator if they fail to reach a mediated settlement within a specific time frame.

However, the picture gets more complicated. As parties engage in Med/Arb negotiations, they need to understand that there are basic differences between traditional mediation and this innovative technique, especially because some conventional benefits of mediation are lost in Med/Arb cases. First, litigants lose the freedom to walk away from the process once they decide to proceed. Each party agrees to a stipulation confirming that if mediation does not succeed, the arbitrator retains jurisdiction to render a final and binding award.

Second, participants will find some problems associated to the disclosure of information during the mediation stage. Since the same third party could eventually become the arbitrator, each side will be careful to divulge confidential information that could later be used against them in the arbitration stage. Hence, parties may withhold information during mediation and limit the effectiveness of this initial stage and the chances for success. More importantly, parties may fail to take advantage of the benefits of mediation because arbitration is just around the corner. If this were the case, the effects would be

actually the opposite as how this technique was design to work. That is why Hoellering (1997) states that it is best when mediation and arbitration are used separate, since *"...each has its own purpose and ultimate morality*."

The Med/Arb notion is very popular in the East, given the Oriental tendency to seek a harmonious solution that preserves the relationship rather than seeking what is legally correct. Whereas most Westerners seek an unbiased judge with no prior knowledge of the dispute, Asians look for a moderator who will not only end their dispute but also assist them in reaching a mutually agreeable solution. A clear example is found in China, where arbitration is combined with conciliation in the ongoing process of arbitration. An arbitrator hears the evidence and attempts to conciliate the parties, but if it fails immediately turns to arbitration.

In Australia, the Commercial Arbitration Act 1984 contains a special clause which suggests the possibility of a "mediated" settlement between the parties before the arbitration proceeding begins (Hollands, 1989). The Act states:[1]

> *"Power to seek settlement of disputes otherwise than arbitration.*
>
> *(1) Unless otherwise agreed in writing by the parties to an arbitration agreement, the arbitrator or umpire shall have the power to order the parties to a dispute which has arisen and to which the agreement applies to take such steps as the arbitrator or umpire thinks fit to achieve a settlement of the dispute (including attendance at a conference to be conducted by the arbitrator or umpire) without proceeding to arbitration or (as the case requires) continuing to arbitration.*
>
> *(2) Where –an arbitrator or umpire conducts a conference pursuant to subsection (1); and a) the conference fails to produce a settlement of the dispute acceptable to the parties to the dispute, b) no objection shall be taken to the conduct by the arbitrator or umpire of the subsequent arbitration proceedings solely on the ground that the arbitrator or umpire had previously conducted a conference in relation to the dispute."*

In other words, arbitrators are authorized by this Act to attempt to resolve the disputes by means other than arbitration. The arbitrator is free to decide on the steps to arrive at a resolution, including pre-trial conferences with the disputants. The parties in the dispute must accept his/her decisions with regards to this stage, but both disputants must accept any settlement. The second part of the clause, allows the "umpire" to proceed with arbitration if the settlement conferences fail to develop an agreeable solution, without having his/her powers affected in any way, because of the initial attempts to reach a agreement.

The arbitrator first attempts to mediate a settlement between the parties. Then, if unsuccessful, proceeds with binding arbitration. The double responsibility assigned to the arbitrator, has also been questioned in Australia (Hollands, 1989). Mr. G. H. Golvan, Barrister, referred to this problem as follows:[2]

> *"...to permit an arbitrator to conduct a mediation conference without prejudicing his entitlement to subsequently embark upon arbitration is a serious anomaly in the Act. Arbitrators should be most cautious, if not reluctant, to attempt to act in both capacities"*

Hollands (1989) concludes though, that in Australia, this provision should be regarded in a positive way, and that it is unlikely that arbitrators would *"...breach the rules of natural justice,"* by hearing evidence and settlement proposals, or issuing final opinions on the issues before the arbitration proceedings take place. On the contrary, this provision encourages arbitrators to incorporate in the pre-trial motions, steps that are likely to promote an early settlement of disputes. This includes exchanges of written expert

testimonies and written summaries of each claim to improve each party's assessment of the case in dispute, or deferment of arbitration date to give parties a time to review and maybe attempt negotiation again.

8.2 ADJUDICATOR/EXPERT DETERMINATION

This binding resolution consists on parties agreeing to refer their differences to an expert, and to be bound by the decision of that authority. This expert will make his/her own inquiries and inspections into the matter, and will not rely upon the parties to select and present evidences to their arguments. The award by the expert, although binding, will normally be enforced as a contract, without the benefits of the direct enforcement that many countries have available for arbitration awards. The following example exhibits the application of this technique in the context of the UK's construction industry.

In 1994, a report by Sir Michael Latham (Latham, 1994) on the state of construction procurement and contractual arrangements in the construction industry of the UK suggested the need for "*expert adjudicators*" with wide ranging powers to review and resolve construction disputes. This recommendation addressed the most important characteristics of a dispute 'resolver' in the construction industry – the need to be fast, decisive, and binding.

As a response to the conclusions issued by the Latham report, legislation in the UK has introduced the concept of the construction adjudicator. Part II of the Housing Grants, Construction, and Regeneration Act 1996 introduced the right for parties to construction contracts to call upon Adjudicators to solve disputes. This Adjudicator combines some of the features of the procedure we have identified as Expert Determination (Section 8.2) with some of Arbitration (Section 8.3). Figure 23, shows the dispute resolution procedure introduced by this Act, and the time-frame in which a resolution of the construction dispute should be expected.

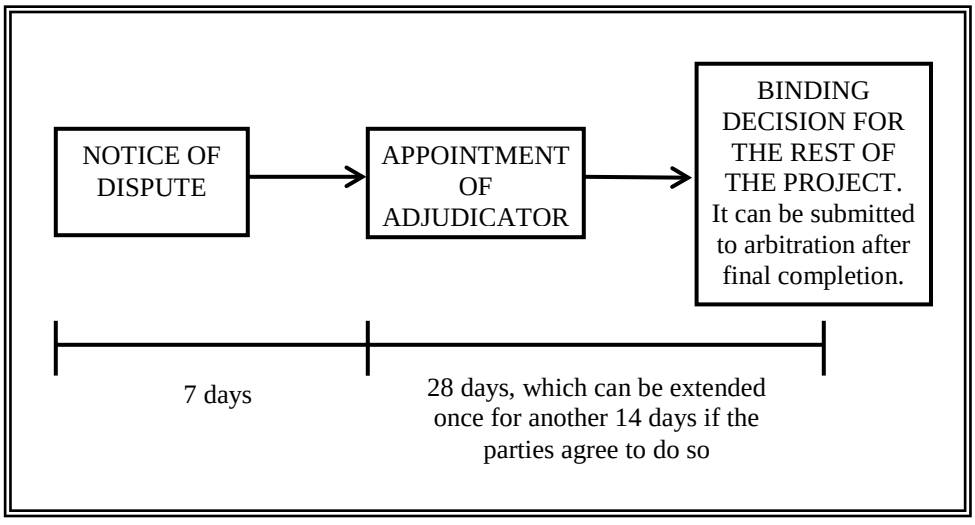

Figure 23 - Adjudicator Procedure for Dispute Resolution

There are two interesting features worth noting in the application of this ADR technique in the UK. First, this procedure is unilateral, so it can be initiated by one of the parties without the consent of the other at any time during settlement negotiations, simply by serving the seven-day notice shown in Figure 23. Once it is requested, the procedure is designed to provide a solution in less than two months. Second, the decision of the adjudicator is binding on the parties, but only for the remaining duration of the project, and can be reversed through arbitration or litigation once the job is completed. In other words, adjudication provides an interim decision, which if unacceptable to one of the parties, can be reviewed and appealed in arbitration or court litigation. It would appear that the objective of this ADR approach in the UK is to provide for a fast, but not final, solution to the dispute in order to allow the job to continue without any further delays. Adjudication "*...is likely to provide a relatively cheap catalyst for settlement*" as parties will be encouraged to address the disputes and reach a settlement, before this procedure is initiated (Staniforth *et al.* 1998).

Despite these advantages, the arbitration community has expressed their concerns towards this dispute resolution method which is neither "*...a fish nor fowl nor good red herring*" (Beresford Hartwell, 1998). Two problems are inherent in this procedure. First, a reliable and knowledgeable adjudicator has to be found, agreed to, and appointed within seven days. This timeframe might be too optimistic, especially since both parties have to agree initially on the person to be appointed. However, this can be accomplished if a roster of qualified adjudicators is pre-selected. Second, some professionals question the ability of the adjudicator to provide just and reliable answers in less than two months, considering that construction disputes can be very complex, with many issues and technical evidence that would require from the Adjudicator certain familiarity with the project in question. Since the Adjudicator is not incorporated in the project from the beginning, he/she will depend on information gathered from both parties to assess the issues and make a determination. This shortcoming could be handled by limiting the type of disputes that the adjudicator could handle.

Because the Act has been in effect for just a few years, researchers suggest waiting to see how the industry will respond to this system before issuing a final opinion as to the strengths and weaknesses of Adjudication, but the introduction of this technique into a legal framework is expected to promote the use of this ADR technique. In fact, a 1994 study by Fenn *et al.* (1994) revealed that this type of dispute resolution mechanism was hardly ever used in the UK, however a similar report conducted in 1998 predicts a significant increase in the use of the adjudicator in the resolution of construction disputes (Gould *et al.*, 1998).

Two additional examples of applications of this concept together with other DART are presented in this book. First, the use of an Adjudicator was incorporated in the Dispute Resolution Ladder of the World Bank for small projects in substitution for the design professional. Second the Dispute Resolution Ladder for the Chek Lap Kok airport project in Hong Kong incorporated this type of third party with binding authority if mediations failed to provide a settlement. In this last application in Hong Kong, the decisions of the adjudicator where binding on the parties only through the duration of the project, and could be overturned by arbitration or litigation once the project was delivered, just like in the UK application described above. No applications of this technique have been found in the US yet.

8.3 ARBITRATION

According to the American Arbitration Association (AAA, 2000), arbitration is defined as "*...is referral of a dispute to one or more impartial persons for final and binding*

determination. Private and confidential, it is designed for quick, practical, and economical settlements." This definition highlights three important characteristics of arbitration, which have made it the most common ADR technique throughout the world and across a wide array of industries:

- Decisions are impartial;
- Decisions are final and binding on the parties; and
- Decisions are issued by knowledgeable experts in the field in dispute.

Observing these characteristics of the proceeding, the AAA also asserts that arbitrators should be selected based on the following basic attributes (AAA, 2000):

- Impartiality and objectivity;
- Dispute management skills;
- Experience with arbitration proceedings; and
- A strong academic background and professional or business credentials.

Because of the essential role played by the arbitrator, the issue of qualifications has been raised by a number of arbitration institutions throughout the world. Harold Crowter, Chairman of the Chartered Institute of Arbitrators in the UK, commented on the matter by saying: "*The future of arbitration is dependent on a number of factors, probably the most important of which is the quality of the arbitrators available to appoint*" (Crowter, 1999). Myers (1994) complements this argument adding that as disputes become more complex, arbitrators will have to assume more active and fundamental role in the proceedings in order to guarantee efficiency and speed in the process to save time and expenses.

In construction, arbitration is typically conducted by a panel of three arbitrators; one selected by each side and the third by mutual agreement or by the organization administering the proceedings, usually the AAA. Parties may establish within their own contracts the size and organization of the arbitration panel, as well as any special rules they wish to include as part of their dispute resolution procedure. Parties may also choose before hand the organization that will administer the proceedings, the location, and the codes and regulations that will be followed. As discussed in Section 2.1.2, arbitration has been the preferred alternative dispute resolution technique after the design professional's determination in the traditional two-step DRL.

In order to adapt arbitration to the needs of the construction industry for a "*speedier and more efficient process than litigation"* (AAA, 1999), the AAA modified its construction arbitration rules in 1996, updated in 1997 for consistency with the AIA documents, and amended again in January 1999 and July 2001. These changes originated partly because of the findings of the ABA survey presented in Chapter 1, but also in response to a continuous decline in filings of construction cases in the AAA since 1991. Between 1983 and 1990, the annual number of AAA construction cases grew from 2,675 to 5,440. Since 1991 however, the number of cases continually declined through 1994, when it reached 3,564 cases. Part of the decline was attributed to less construction due to the recession of those years, but AAA also recognized that companies were finding other solutions for their construction disputes (i.e., minitrials, mediation, neutral advisors, or dispute review boards) (ENR, 7/11/1994). The new organization divided arbitration cases into three possible procedures:

- Fast Track Rules for cases up to $75,000;
- Regular Track Rules for all other cases, and
- Large Complex Track Rules for cases involving in excess of $1,000,000.

These procedures, each with a specific set of rules, are key in illustrating some of the problems experienced with arbitration in the resolution of construction disputes. A summary of the key aspects of each of these new rules follows (based on AAA, 1999). It is instrumental to provide relevant information as to the changes introduced in response to the apparent decline in the use of Arbitration[3] and the concerns expressed by the ABA in the above referenced survey.

Fast Track Rules:

With specially designed procedures for small construction cases, these rules apply to two-party disputes where no total claim or counterclaim exceeds $75,000. The different features included are supposed to expedite the process and not always require a physical encounter of the parties with the arbitrator. Some fast track rules are:

- Parties select the arbitrator from a list of available professionals supplied by the AAA. Selection must occur within seven days from transmission of the roster.
- The award must be rendered within 60-day time limit from the day the arbitrator is appointed, and seven calendar days from the close of the hearings.
- Preliminary conferences are by telephone or other electronic channel.
- There are strict limits for information exchange and discovery. Also there are limits on changes and extensions to avoid add-on claims and schedule modifications.
- The AAA can also serve notices to the parties by telephone or fax to expedite proceedings.
- For cases where no claim exceeds $10,000, the dispute is resolved with a one-day 'desk arbitration' by submission of documents without hearings, unless the parties or the arbitrator chooses to have them. In this case the arbitrator serves without fee.

Regular Track Rules:

These rules govern all cases not covered by the Fast Track or Large Track Rules. Regular track procedures are very similar to standard arbitration rules for construction projects, but they have been upgraded to improve the procedure in the areas of qualifications of the arbitrators, arbitrators' authority, and speed of the proceedings.

Regular track rules offer the arbitrator great amount of power to affect the final results of the dispute. Other characteristics of this procedure are:

- Enhanced party input regarding arbitrator qualifications and other needs.
- Parties can change claims and counterclaims before the hearings are completed. After that, any different claim must receive arbitrator approval.
- To decrease administrative costs and expedite the process parties may only strike three names in single arbitrator cases and five names in multi-arbitrator cases from roster of arbitrators.
- The arbitrator has the clear ability to direct the production of information and the identification of any witnesses to be called.
- Arbitrators can control the order of proof, bifurcate proceedings, exclude cumulative or irrelevant testimony, direct parties to focus on relevant information, entertain motions to dispose of all or part of the claim, make preliminary rulings or interlocutory orders, and/or request offers of proof.

- Arbitrators have the explicit authority to make interim protective measures.
- The arbitrator is admonished to provide a 'concise', written breakdown of the award. If requested, arbitrators can also provide a written explanation of the award.
- The arbitrator can correct any clerical, typographical, technical, or computational errors in the award upon the request. However, the merits of the award are final.

Large, complex case rules:

A supplement to the Regular Track Rules, the AAA rules for complex cases allow the parties to tailor the norms to the specific needs of the case in hand. However, the AAA increases its involvement in these cases, and any modification must be made before the selection of the arbitration panel. The $1,000,000 limit for the utilization of Large Case Rules excludes fees, interest, and attorney costs. Some important features of these rules are :

- Hearings will be scheduled in blocks of days.
- The AAA is required to conduct an administrative conference with the parties to: a) obtain additional information about the dispute; b) review and discuss parties' views regarding the qualifications of the arbitrators; c) collect each party's conflict statement in writing; d) introduce the use of mediation or other non-adjudicative methods.
- Arbitrators are required to have a minimum of ten years experience, with a strong reputation for impartiality, patience, good judgment, integrity and attentiveness.
- Three arbitrators are the norm, unless parties agree otherwise.
- Once arbitrators are selected, parties and panel must meet to review various issues such as the scheduling of hearings, extend of discovery, prospective witnesses, undisputed facts, and the possible use of non-adjudicative methods.
- Arbitrators will direct the production of documents and limit discovery.

A common feature of these three sets of rules is that they try to make arbitration more flexible and less costly. In any case, the industry continuously emphasizes the development of alternative methods to simplify the dispute resolution process. The following two sections, Single Arbitrator and Baseball Arbitration, are a good example of these developments.

8.3.1 SINGLE ARBITRATOR

For small and simple cases, a single arbitrator instead of the panel of three experts proposed in Section 8.3 can be used. Parties follow the same arbitration rules, but save costs by having only one expert presiding over the hearings and deciding on the award.

The obvious disadvantage of having a single arbitrator is that the analysis and decision making rests on one person. The three-member panel provides a "check and balances" system that is not available in a single arbitration; therefore the savings should be weighed against the risks of not having multiple viewpoints when reviewing questions and issuing the award.

As described in Section 8.3, the AAA has introduced a fast-track, single-arbitrator system to shorten the processing time of small and simple disputes. This system is for disputes worth less than $75,000.00, which encompass 50% of the construction cases filed in AAA for arbitration. A survey conducted by the AAA on over 2,100 projects between 1995 and 1997, to determine if this approach was resulting in actual benefits to the disputants, concluded that the new fast track single-arbitrator procedures had reduced the

average number of days to resolve a dispute by 33 days, from a previous average of 159 days (DRT, 1997/1998). This survey also found that the average time to appoint an arbitrator from the day the case is filed had increased from 46 to 51 after the implementation of the new system. This delay was associated with the fact that parties have the option of selecting the single arbitrator by mutual consent from a list of candidates, rather than having the AAA impose one as in the old procedures.

8.3.2 BASEBALL ARBITRATION

In this form of ADR, a single neutral arbitrator is chosen to preside over the dispute. Both parties make a presentation of their cases, and propose their respective "best offer" for a settlement. The arbitrator then selects one of the two proposals, and settles the dispute. This type of ADR is called Baseball arbitration because it originated in the US Major Leagues to resolve contract negotiations between owners and players regarding salary conditions (Fizel, 1994).

The hearings under this approach are usually presentations, in which parties are limited as to the amount of exhibits they can submit and the number of expert witnesses. These characteristics result in a faster process and a binding decision. Furthermore, because the arbitrator can only select one of the two options, parties are encouraged to present and honest settlement to increase the likelihood that the arbitrator will select their option.

The main disadvantages of this approach are that it offers no flexibility and prohibits alternative solutions. The arbitrator is limited to one of the two options presented by the disputing parties. Baseball arbitration is an imperfect yet viable method for resolving disputes. In the Major Leagues of Baseball this procedure has solved 9 out of 10 cases (Fizel, 1994), without the need of conducting a full arbitration proceeding as outlined in Section 8.3.

CN Oil Refinery Project (Venezuela)

During the construction of a Refinery Complex for Heavy Crude Oil in Venezuela, the Mechanical, Structural Steel and Equipment Erection Contractor (Contractor) experienced significant disruptions due to unforeseen labor conditions in the Industrial Complex where the Refinery was located. The total number of Man-hours grew from a bid estimate of 1,500,000 to 3,000,000 man-hours spent and the project was completed in 26 months instead of the 18 originally planned.

Among the labor conditions experienced by the Contractor during the execution of the works were:

- Labor strikes during labor contract negotiations with Refinery Owner
- Shortage of skilled labor
- Overcrowding and trade stacking
- Extensive overtime and shift work

The contract between the Contractor and the Engineering Procurement and Construction Consortium (EPC) specifically excluded labor strikes in the Force Majeure Clause, which stated:

"Force Majeure means events or circumstances after the Effective Date which are unforeseen at the time of execution of the Contract and beyond the control of the party claiming Force Majeure… and which renders the execution of the obligations impossible… including acts of governmental authority, acts of God, fires, floods, earthquakes, explosions, riots, war, rebellion and sabotage, but excluding lack or shortage

of labor, strike or boycotts caused by Contractor's or its Subcontractors' own workforces…"

The impact of the labor disruptions caused a significant deviation in the financial results of the Contractor, who repeatedly requested an adjustment in the contract amount from the EPC with no positive results.

Because the contract required that any disputes be settled via arbitration after project completion, the Contractor hired an independent auditor halfway in the job to perform an Independent Third Party Review of the project. The objective of this review was to have an objective snapshot of the conditions under which the contractor was required to work, for future use during negotiations and/or arbitration. The benefits of carrying out this review at that time it was performed were:

- Objective analysis and review of project status, performed by an expert in the field of claim management.
- All documentation was gathered and organized with one file structure for future use at the end of the job.
- Key variables for measuring the impact on job productivity were established for the remainder of the job.
- A separate cost structure was set-up to monitor and record cost deviations incurred because of the conditions affecting the job.

In terms of the cost of the Third Party Report, the Contractor spent approximately US$20,000 on a project worth US $30 million. In other words, less 0.07% of the original contract amount for a document that is now helping settle a claim of approximately US $20,000,000 in value to the Contractor (2 million Man-hours at US$20 each).

Currently, the Contractor and the EPC are in negotiations attempting to settle their differences and close the contract before having to go to arbitration in Switzerland. The Independent Third Party Report is proving to be an invaluable tool and reference guide for both parties. Although the amounts are significant and the parties are far from agreeing on the final number, the information gathered halfway on the job by this third party and the organization that was established then is helping to clear the path towards an agreement.

8.4 SHADOW MEDIATION

In this last form of binding ADR, parties proceed with arbitration but retain a mediator (Section 7.2) who sits through the proceedings and reviews the information submitted to the arbitrators. As the cases are presented before the arbitration panel and issues are defined through the discovery phase, parties can request that parts of the dispute be removed from arbitration, in order to attempt to settle them through mediation. If parties agree, they can actually stop the arbitration and submit the whole case to mediation. In addition, the "*shadow mediator*" can also recommend possible settlement options or areas of common ground where parties could negotiate a solution faster than through arbitration and possibly in better terms for both disputants.

Although this procedure increases the cost of the proceedings by incorporating the mediator, it provides some flexibility to the arbitration process, in that it allows the parties to stop the binding approach and settle the dispute faster through mediation. By having two different parties running the procedures in this system (i.e., arbitration and mediation), this technique overcomes the problems discussed in Section 8.1 with regards to the dual role assigned to the arbitrator in the Med/Arb technique.

Reservoir Project

By reviewing the scenario in the Reservoir case, we can predict sources of conflict that one might encounter in this project. Environmental concern (Uncertainty, External) is the major source of conflict. The misunderstandings and possibly unrealistic expectations of the owner (Organizational issues, People) also played a role in the dispute.

This case went to binding arbitration. The contractor presented his case with the following argument.

1) The contractor based their bid price on modifying the access road.
2) The lack of this access resulted in their inability to complete the project in one season, significantly impacting the cost.

The contractor calculated damages in excess of US$ 1.0 million. The owner presented his case with the following argument.

1) The contractor did not request for widening this access road until after the permits were issued.
2) The contractor was aware and involved during the request for use of this road, as well as cognizant of the degree of environmental sensitivity.
3) The contractor has shown no proof that its bid was based on this access.
4) The allegation of the contractor's bid price was based on this access was unreasonable considering the representations made in the bid documents and during the pre-bid meetings by the owner.

A single arbitrator decided this case. Using their impartial knowledge, the arbitrator explored the facts and rendered a judgment in favor of the owner.

8.5 SUMMARY

Arbitration, the first binding step in the ladder, was initially introduced as an alternative to Litigation, to ameliorate the disadvantages of this procedure associated with high costs, time consumption, and strains in the relationship among the parties. However, as Arbitration became a popular dispute resolution technique, it lost many of the qualities that had supported its success: resembling more and more the litigation procedure, and suffering from many of its limitations; increased formality, cost, and tension between parties; and decreased control by the parties of the project and flexibility of outcome. Arbitration represents a definite move away from the "win-win" approach, and thus involves increased tension among parties, reduced communication, and an adversarial stance. Information exchange becomes significantly compromised, and legal representatives become the filters of such communication.

Nevertheless, despite the great resemblance between this stage and the final stage of litigation, Arbitration continues to preserve some valuable and unique traits. Its main advantage over litigation is the reliance on knowledgeable third party neutrals, with recognized expertise in the construction field. This expertise facilitates his/her understanding of technical and complex construction situations; thus, proving to be more effective than litigation in those disputes that require significant understanding of technical data, rather than in those where legal issues have become the center of the dispute, for which litigation might serve as a more adequate procedure.

Through the years, Arbitration has become one of many Binding procedures, which are often a modification of the initial form of Arbitration in an attempt to solve some of its limitations, yet by doing so they have introduced a new set of challenges. Four of the

techniques presented in this chapter, in addition to Arbitration. Med-Arb introduces mediation as a prior step to arbitration, yet sustains that the same expert will serve as the mediator and the arbitrator throughout the process. This role change has been the focus of concern to those involved in Arbitration. Shadow Mediation follows the same principles of Arbitration with the added figure of a mediator, who witnesses the arbitration process, and identifies possible areas for mediation that can be withdrawn from the arbitration process. The Adjudicator consists of an expert neutral-third-party, who performs a similar role than the Neutral Advisory, with the added attributes of being able to perform fact finding and issue a binding solution. Lastly, in Baseball Arbitration each party presents their "best case" and the arbitrator chooses the final settlement among those two options. The first two techniques represent an attempt to increase mediation during binding procedures, when compared to the traditional arbitration; the last two aim for a rapid closure of the dispute, paying less attention to enhancing the communication among the parties, moving dramatically away from a win-win solution. Chapter 9 will review the final stage in the DRL: Litigation, in which the win-lose approach is the basis of this procedure. This chapter will address a number of techniques that can help reduce the limitation of litigation.

8.6 POINTS FOR DISCUSSION

8.1 What are the basic major differences between traditional mediation (Section 7.2) and binding Mediation/Arbitration (Section 8.1)? Are there other differences that are pros or cons for this method?

8.2 Discuss the intentions of Mediation and Arbitration. Can they effectively be incorporated in to a single solution such as Mediation/Arbitration (Section 8.1)? What is lost, what is gained? In what cultures does Mediation/Arbitration work best?

8.3 In the United Kingdom, an Adjudicator (Section 8.2) is appointed by the request of either party. What problems does this pose if the other party doesn't approve?

8.4 Does an interim decision made by an Adjudicator (Section 8.2) carry any weight or does it just buy time for the parties to finish the job before diving into litigation? What effect does the semi-binding decision have on the process?

8.5 Is the Binding Arbitration (Section 8.3) really the last step? Can a contractor/owner still file suit after they have received a binding decision? Why or why not?

8.6 The AAA revised the rules for construction arbitration in 1996 (Section 8.3). How are they tailored to the current trends in DART? Was this a sensible move for the AAA considering the declining number of cases they were involved in?

8.7 Over time Binding Arbitration (Section 8.3) has come to closer and closer to resembling litigation. Will they eventually become one in the same? If not, what defining attributes will keep them separate?

8.8 Who should cover the costs associated with Binding Arbitration (Section 8.3)?

8.9 Can a democratic government, such as the US, impose contractors to submit to binding arbitration before filing for litigation?

8.10 What are some advantages and disadvantages of having a Single Arbitrator (Section 8.3.1)? Multiple Arbitrators (Section 8.3.2)? A Shadow Mediator (Section 8.4)?

8.7 REFERENCES

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8.8 ENDNOTES

[1] This Act is part of the Uniform Commercial Arbitration legislation in force in most States and Territories of Australia (Hollands, 1989).
[2] Speech given by Mr. G. H. Golvan, Barrister, to a Melbourne Forum of the Institute of Arbitrators of Australia in 1985; cited by Hollands, 1989.
[3] The problems with Arbitration in construction disputes are discussed in Section 2.2.2.

CHAPTER 9

STAGE 6: COURT ALTERNATIVES AND LITIGATION

"it is the judge-driven change to litigation culture that is likely to lead the breakthrough"

Coates (1997)

In the western United States, a hospital heating plant was in need of an upgrade before the following winter season. This particular hospital was owned by a federal government agency. After design was completed, it was competitively bid out in accordance with federal regulations. The contract included the renovation of the heating plant as well as some new additions to the plant. The work was estimated to cost US$ 45 million.

The contractor that was awarded the project was located in the northeastern United States. It was the first time that they had ventured out side of their geographic region, to bid work. Since they had no local office, their staff was sent to the site for the duration of the project. During the construction phase of the project, problems relating to the design and schedule began to arise. Typical of renovations projects, the scope of work came into question. What exactly is required by the contract documents and what is not became a gray area, which the owner and the contractor began to negotiate. The contractor

CHAPTER LOOK AHEAD

WHAT IS IT? Litigation is the final step in the Dispute Resolution Ladder. At this stage, both parties have lost all control over the outcome. Awards are based on monetary compensation, where one side wins and the other loses. However, even if a dispute proceeds to litigation, there still are some possible options to improve the situation, including a solid discovery and an effective presentation.

WHO IS INVOLVED? At times, the court may appoint an outside third party to listen and decide the case. These individuals may include experts in the field of construction, retired judges, or lawyers. Otherwise, this process involves lawyers, a judge and/or a jury. Expert witnesses are needed to explain the situation to a judge or jury unfamiliar to the construction process.

WHY IS IT IMPORTANT? Although not the focus of this book, litigation influences the whole dispute resolution spectrum. The cost of litigation and time required for a decision has been the driving force behind the development of DART. In addition to this, there are certain steps that can be taken to prepare for litigation that are also needed in other dispute resolution methods.

HOW TO APPROACH IT? Review the facts from both sides. Take time and evaluate the other side's position as well as your own, noting the strengths and weaknesses. Prepare an effective presentation.

KEY CONCEPTS

questioned the how the liquidated damages were assessed based on the schedule with such problems. The owner refused to reveal how the liquidated damages were calculated.

The contract called for Step Negotiations, so that the conflict could be resolved at the lowest level possible. With the upper level management of the contractor and the owner so far away, the only effective negotiations were on-site. There was little oversight of the project from the home office. As the differences increased, the negotiations began to break down. Personality conflicts between the on-site representatives escalated the conflict into the next stage of the dispute resolution ladder. This stage required both sides to appoint an expert knowledgeable in the field of construction. Each selection had to be approved by the other party. An unorthodox, binding mini-trial would then follow. Since this was a federal contract, if this stage failed, the dispute would be resolved in a federal court. An overburdened federal court system would be very likely not to uphold the decision of the arbitrators.

Both parties in this dispute have valid claims and neither wanted to proceed to litigation. There is no definitive right and wrong. How might a solid understanding of the facts help resolve this dispute? What effect does the personality conflict have on the dispute? What other reasons might have caused the negotiations to fail?

9.1 THE FINAL STEP

Although not an alternative dispute resolution technique (DART), Litigation has been included as the last stage in the Dispute Resolution Ladder (DRL) for two reasons. First, it is one of the methods available to resolve disputes, although not the most effective and efficient one. Second it is reviewed to be able to assess a number of techniques that have been developed within this stage that can lead to faster and more effective trials.

"Litigation can be productive if it helps define legal and factual issues, building a foundation for fair and expeditious settlements, but ...a decade or more may pass before there is any resolution of a dispute by the courts, leaving no one a winner." (ENR, 2/15/1999). In other words, the settlement of disputes in this stage will always involve one party losing its case, and another one winning. A court award that results in neither party winning at the expense of the other one (i.e., win/win) is not foreseeable in the near future. In litigation, there is limited flexibility to develop compromises and solutions that can maintain business relationships, and improve job-site productivity. Costs in this stage are high, and the resolution of the disputes can take a significant amount of time and resources. Therefore, litigation should be avoided by implementing one of the many DART reviewed in the previous chapters, or a combination of them in a DRL system.

However if one must go to litigation, many things should be considered when pondering litigation. Has a thorough discovery of the situation been performed? Is there enough evidence to support the claim? Are the resources available to engage in a trial? In what court system will this case be tried? Has an attorney been selected? If not, how should one be selected? Will this be a bench trial or a jury trial? How long will the trial take and what are the ramifications of a lengthy trial? Are there any previously decided cases similar this one? Are their any other options?

This chapter addresses some of these questions and provides some alternative options developed by courts in the United States.

9.2 DISCOVERY OF SITUATION

One-step that is important in presenting a case is a solid discovery of the dispute. The basis of the discovery is a thorough understanding of the facts. This is necessary for all participants, so that everyone is on the same page. At times, this discovery does not occur until conflict reaches litigation because parties in an adversarial relationship are always hesitant to present documents or divulge information that may be detrimental to their argument, unless ordered to do so. This discovery of information can sometimes even resolve the dispute. As more information is uncovered, one side may realize that their claim or position is incorrect or unsubstantiated. Therefore, discovery itself can be a method that can avoid or resolve a dispute.

The first step of the discovery process is to thoroughly review and understand the contract. The contract is the 'handbook' for the project. If drafted properly, the contract will outline the responsibilities for all the parties involved. After this, investigation of the dispute begins. This process takes time and persistence to get the necessary information.

Various methods of discovery are used. The main modes of investigation used in the construction industry are requests for documents, questioning participants, written accounts, and site investigations and testing. The request for documents can be the most valuable, but are also probably the hardest to obtain. Contract documents are already in the hands of both parties, but daily logs and personal project diaries are tougher to obtain. The same is true for depositions and written accounts. The basic facts of the dispute will probably not change much from person to person, but getting a participant to admit a mistake or take responsibility for a mistake is a challenge. In addition to documents and statements, site investigation is also important. For example, quantity disputes can be resolved by surveying the site. Numerous other performance related disputes can be resolved by site investigation and testing.

Going back to previous DART identified in this book, Escrow bid documents (Section 3.3) is a prevention technique can be used to make the discovery process easier. This set of clean documents can provide valuable information as to how the job was bid, reducing the tendency of misrepresentation on behalf of the contractor. In effect, a number of valuable documents are readily available should a dispute arise. An added benefit of having a third party review these documents is that the information irrelevant to the situation remains confidential to both parties.

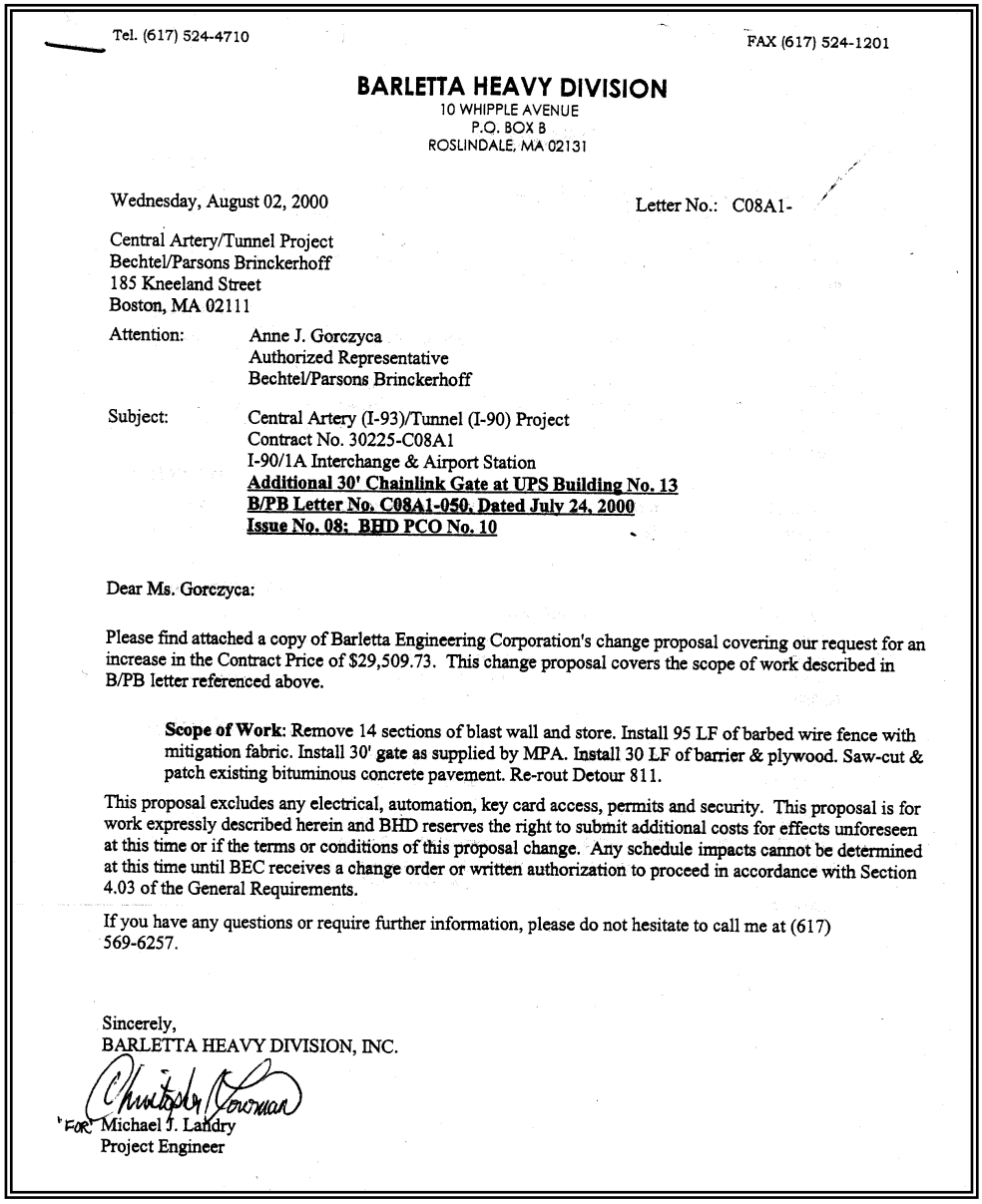
It should be mentioned that both sides are not entitled to every piece of information. A conversation between each party and their lawyer is privileged material. That is, the attorney and their client are the only ones entitled to this information.

9.3 EFFECTIVE PRESENTATION

Following a through discovery is an effective presentation. Whether it be in court, before an arbitrator or with the other party, the ability to present your understanding of the facts in a logical, timely, persuasive manner is vitally important. This skill leads back to the fundamentals described in Chapter 5: Negotiation. By selecting an appropriate strategy and understanding both sides of the argument, it will help you present your side effectively. Even a valid claim can be denied if the claimant does an inadequate job of presenting their case.

The effective presentation of a claim usually starts when the contractor files a claim with the owner. This claim should be a written notice with all the necessary information required by the contract and delivered to the owner in accordance with the contract. This

notification initiates the conflict. It should be professional looking and include relevant information describing the incident, the date discovered, what action the owner is expected to take, the timeframe it should be resolved in and whether or not more information will follow. An example of this is presented in Figure 24. Along with the letter, the Contractor has attached a detailed breakdown of the labor equipment and materials that will be needed to complete the work The owner's obligation is to accept the claim in good faith, objectively review it and make a prompt decision as to what action they will take. If the owner cannot make a prompt decision for various reasons, it is appropriate to send a courtesy letter stating the reason for delay. As we have learned from this book, the impact conflicts can have on a project tend to escalate with time. If either party fails to address the conflict when it arises, there is a greater probability that it will escalate into a lawsuit.



Tel. (617) 524-4710 FAX (617) 524-1201

BARLETTA HEAVY DIVISION
10 WHIPPLE AVENUE
P.O. BOX B
ROSLINDALE, MA 02131

Wednesday, August 02, 2000 Letter No.: C08A1-

Central Artery/Tunnel Project
Bechtel/Parsons Brinckerhoff
185 Kneeland Street
Boston, MA 02111

Attention: Anne J. Gorczyca
Authorized Representative
Bechtel/Parsons Brinckerhoff

Subject: Central Artery (I-93)/Tunnel (I-90) Project
Contract No. 30225-C08A1
I-90/1A Interchange & Airport Station
Additional 30' Chainlink Gate at UPS Building No. 13
B/PB Letter No. C08A1-050, Dated July 24, 2000
Issue No. 08; BHD PCO No. 10

Dear Ms. Gorczyca:

Please find attached a copy of Barletta Engineering Corporation's change proposal covering our request for an increase in the Contract Price of $29,509.73. This change proposal covers the scope of work described in B/PB letter referenced above.

Scope of Work: Remove 14 sections of blast wall and store. Install 95 LF of barbed wire fence with mitigation fabric. Install 30' gate as supplied by MPA. Install 30 LF of barrier & plywood. Saw-cut & patch existing bituminous concrete pavement. Re-rout Detour 811.

This proposal excludes any electrical, automation, key card access, permits and security. This proposal is for work expressly described herein and BHD reserves the right to submit additional costs for effects unforeseen at this time or if the terms or conditions of this proposal change. Any schedule impacts cannot be determined at this time until BEC receives a change order or written authorization to proceed in accordance with Section 4.03 of the General Requirements.

If you have any questions or require further information, please do not hesitate to call me at (617) 569-6257.

Sincerely,
BARLETTA HEAVY DIVISION, INC.

FOR Michael J. Landry
Project Engineer

Figure 24 – Example of a Proposed Change in the CA/T Project

Meetings should be set up upon receipt of a major claim by either side. In preparation for these meetings, facts and information should be gathered by both sides, in other words a thorough discovery of the situation (Section 9.2) should be preformed. Authorized representatives from all sides of the conflict should attend. It does not aid in the dispute resolution process to send anyone who is not authorized to act on behalf of the participant. One should prepare relevant information specifically tailored to the listening party when presenting their interests. Research whom the presentation is for and prepare accordingly. Is it a lawyer, a jury, the owner, an arbitrator, or is it the contractor? Know the strengths and weaknesses of both sides and tailor your presentation to these. If there is a personality conflict, ask that another representative attend.

All materials and documentation presented should be professional and not altered in anyway. Keep this in mind when preparing project documentation on a daily basis. Any comments that you do not want read aloud in court, do not write down. As a rule of thumb, record only the events and facts and keep editorials/opinions to a minimum. The same is true for presenting. Present only the facts, avoid accusations, and finger pointing. A confident, professional performance is usually the most persuasive. In addition, all material should be presented as soon as it is discovered. Do not hold back any information. An effective way to present this information is in a formal report with an executive summary in the front, followed by an appropriate assessment of the situation, with exhibits such as contract documents, photographs, schedules, and bid information attached as backup.

If the dispute does make it to court, a presentation in the form of expert testimony can be one of the deciding factors in determining the award. Although expensive, these experts bring validity to the claim. Most of the time, judges and juries are unfamiliar with the construction industry and are forced to rely on the opinions given by these expert witnesses. For instance, a waterproofing subcontractor waterproofed the walls with a substance that did not meet the specifications in the design. A lawsuit resulting from a leaking basement was filed. Validity can be brought to this claim by bringing in another waterproofer (considered an expert) who states that the standard in the industry is to use better quality materials and the original subcontractor should have known better.

A solid discovery of the facts and an effective presentation can reduce time in court, accurately portray the facts, and aid in winning the case. For instance, if the conflict does escalate to the courtroom, not all hope is lost that the process will be inefficient and lengthy. In the following sections, three techniques review some of the different procedures developed in the judicial system for use during court proceedings, which can improve the litigation process: Court Appointed Experts (Section 9.4), Judge Pro-Tem (Section 9.5), and Trial by Reference (Section 9.6). These techniques have been developed by specific courts in an effort to expedite the resolution of civil disputes. They also reinforce the idea that the construction industry must find ways to reduce the cost and time impacts of litigation, even if the court proceeding is already underway.

9.4 COURT APPOINTED EXPERTS

A variation derived from the concept of expert testimony is using a court appointed expert instead of a judge to decide the case. Because in many construction disputes the conflict revolves around a technical question, which requires an opinion from a qualified witness, an expert witness appointed by the court to decide the case, can significantly lower the costs for all parties. This DART is similar to court appointed arbitration with an expert as an arbitrator. According to Zack (b, 1997), this approach starts with a definition of the issues that will require expert testimony and a cost-sharing plan to cover these expenses. Then, both parties present two or three possible experts to the court, and the judge selects one per issue. The experts work for the court, but the disputants cover the costs.

The benefits of implementing this technique are obvious in terms of costs, since both parties are sharing the expenses of only one expert testimony per issue. In addition, Zack (b, 1997) points out that the duration of the hearings is substantially reduced by making the parties agree before hand on the issues that require expert testimony and by eliminating testimonies from two or more experts from each party that might be conflicting.

The problems of this process are associated with the selection of this common expert. If the judge fails to select the best expert from the proposed options, the overall proceedings will lack the technical depth required to resolve some of the more complicated issues. More importantly, by having only one testimony, the outcome may depend on it too much. Therefore, parties most pay close attention to the pre-selection process of the experts and the presentation of the possible options to the court.

A variation of this approach is reported by Treacy (1995) in the Eastern District of New York. This court offers disputants the possibility of reviewing the matter in dispute with an impartial attorney with expertise in the area in question. This neutral helps parties organize the issues in dispute, explore possible settlement options, and can provide upon request an assessment of the likely outcome if the dispute in brought to trial. Treacy (1995) identifies three benefits of this procedure. First, it helps parties organize and learn about their respective cause before the trial. Second, it can be less expensive than full discovery proceedings and pre-hearing motions. And third, the information is kept confidential, since the court does not participate directly in the proceedings. So, parties are free to develop an alternative solution with the help of the expert if they so desire once they have fully understood the case and issues in dispute.

9.5 JUDGE PRO-TEM

In an effort to expedite getting the dispute to trial, parties may agree to have the courts appoint a *temporary judge* to preside over the trial. This judge has to be an attorney, and he/she gets all the powers of a presiding judge for the specific case. Litigation then follows all stipulated court proceedings. In the United States, most States authorize this procedure, and the temporary judge maintains jurisdiction over the case until a final determination is reached, including any post-trial procedures.

By having a judge who is independent from court schedules, parties can initiate the proceedings faster and schedule all the other hearings and motions with more flexibility. This represents an advantage considering that the average court resolution process in the US takes between 2 to 5 years (Findley, 1997). A disadvantage according to Zack (b, 1997), at least in the United States, is the need to give up the right to a jury trial in case of disagreements with the award by the temporary judge.

9.6 TRIAL BY REFERENCE (REFEREE)

In this procedure, the court appoints a neutral expert to preside over the complete trial or specific sections of the proceedings. This expert does not have to be a lawyer, and the court upon appointment sets the authority of the expert and the rules of the procedure. The expert presents the legal and technical findings to the court, and the court issues judgment. The expert's report is binding, but it can be appealed.

This procedure provides for a faster procedure and privacy during discovery. In highly complex cases, it allows the courts to select an expert with the technical knowledge required to understand the issues and provide a faster ruling than that of a judge in a standard court proceeding. The disadvantages are that trial costs are not reduced, since both parties still have to prepare for trial, and the decisions are not final and can result in appeals and re-trials.

In the UK, the Court of the Official Referee (Gould *et al.*, 1998) is an example of this procedure that has been incorporated and developed into a separate and specialized section of the judicial system. Most construction disputes are presented at this court,

which is a branch of the Queen's Bench Division of the High Court. Its purpose is to hear cases that require *"...prolonged examination of documents or accounts, or a technical scientific or local investigation..."* (Gould *et al.,* 1998), around 80 % of the Official Referees' business is related to construction. Within the Court of the Official Referee, a number of procedures have been developed to manage and expedite the settlement of its cases: (Gould *et al.,* 1998)

- *"Holding regular pre-trial summon or meeting with the parties in order to discuss and decide the manner in which the trial will take place.*
- *The use of timesaving written procedures.*
- *The use of a high level of computerization in the court to handle information and documentation. In 1996, the "...first 'paperless' trial was conducted before one of the Official Referees using a fully developed case management system.."*[1]
- *Suggesting to parties to consider ADR before continuing with the court proceeding, if they have not done so yet."*

Other examples of court initiatives to promote and use of dispute avoidance and resolution techniques in the UK include: (Gould *et al.*, 1998)

1) Since December 1993, disputants are required to inform the courts during pre-trial meetings whether they have considered using alternative dispute resolution. In addition, since 1995, attorneys are required to file a pre-trial summary stating whether they reviewed with their clients alternative dispute resolution, and whether they considered that all or part of dispute could be addressed through an alternative technique.
2) A 1996 court direction gave judges an active role in the implementation of DART by authorizing them to stop proceedings and encourage the implementation of a DART (i.e., mediation), and to offer neutral evaluations of the case.

These initiatives support the idea that the increase use of DART in the UK is fueled by the court system. Two studies by public authorities, Lord Woolf and Latham (1994), have provided the basis for the evaluation of litigation proceedings, and the introduction of alternative practices, confirms that part of the DART "*revolution*" in the UK is coming from within the judicial system. On this subject Coates (1997) concludes that "*it is the judge-driven change to litigation culture that is likely to lead the breakthrough*" in the implementation of DART.

Hospital Heating Plant Project

Returning to the hospital heating plant, it can be seen that a solid discovery of the facts did not occur. When the contractor requested that the owner demonstrate how the liquidated damages were calculated, the owner refused. When the negotiations began on-site, they failed in part due to the personality conflicts, but also to the fact that the contractor's presentation was ineffective.

When the next step of the DRL was reached, the contractor did not make the same mistakes twice. The contractor and the owner both selected their experts. Unlike most mini-trials, the contract allowed the experts to meet with their parties before the trial where they would hear the cases presented by both sides. This unorthodox method allowed for a thorough discovery of the facts by each of the experts for both sides. The experts became intimately familiar with the claims of both sides. When the trial began, the experts heard the claims by both sides and actively asked questions, probing the other side. The experts then negotiated amongst themselves resolving each issue at hand.

This method eliminated the personality conflicts that made negotiation impossible. In addition is allowed for a solid discovery of the facts, a professional presentation of the material, the opportunity for a win/win situation. In this case, there were no losers.

9.7 SUMMARY

Litigation is the final stage in the DRL. Although it is considered a costly, time consuming, and less flexible procedure, it is not an unlikely outcome for many construction projects. Litigation comes about when other DART have failed to work, when arbitration clauses are not incorporated in the contract, and/or when the nature of the conflict, characteristics of the dispute, or the relationship between parties, do not allow for intermediate steps; for example, in those situations where legal issues, rather than factual, are the main focus of the dispute. In this Stage of the Dispute Resolution Ladder, a third party makes the final decision on the dispute.

A solid discovery of the situation and an effective presentation can soften the impacts of litigation. A thorough understanding of the facts is necessary for all participants. This can reduce the issues and can even resolve some of the areas of dispute. Start with reviewing the contract, and then begin to investigate the dispute by requesting documents, questioning participants, taking written accounts, and investigating the site. When presenting this information, be confident and professional. Know the audience, select and prepare accordingly.

Considering the many limitations of this stage, be preapared for a lengthy expensive battle. This chapter proposes three procedures to attempt to overcome the many challenges of litigation: Court Appointed Experts, Judge Pro-Tem, and Trial by Reference. Although these three options within the litigation process offer the parties in the dispute ways to save money and time, they fail to provide a flexible, cost-effective, and fast option to resolve disputes, for they all happen in a court context. An important advantage shared by the three options described above is the fact that the parties are required to meet, communicate, and agree on certain issues in order to implement any of them. This “forced” communication among the parties in preparation for, and during the court hearings, could open the door to new settlement options, and can stop litigation, or shorten the proceedings.

9.8 POINTS FOR DISCUSSION

9.1 What are the various methods involved in the discovery process (Section 9.2)? What are the cost implications of each? What are the roles of the participants in the discovery?

9.2 How might a through discovery (Section 9.2) promote a settlement before the trial begins?

9.3 What constitutes an effective presentation (Section 9.3)? How might one improve their presentation?

9.4 What are the major disadvantages of litigation?

9.5 What is the difference between a court appointed expert (Section 9.4) and an arbitrator?

9.6 Construction accounts for a solid amount of litigation throughout the world. To reduce tying up judges in these civil disputes, should court appointed experts

(Section 9.4) be the standard in the judicial systems throughout the world? Argue the pros and cons.

9.7 Is Judge Pro-Tem (Section 9.5) any different from litigation? If so, how?

9.8 The majority of judges and juries do not have a construction or engineering background, and lack technical expertise. Does this fact influence the decision in a positive or a negative way? Why?

9.9 The issue of a knowledgeable deciding authority is addressed in the Trial by Referee (Section 9.6) technique. By appointing this figure, what benefits do the parties lose?

9.10 Are there any reasons that a dispute should go to trial and not be resolved by other means?

9.9 REFERENCES

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9.10 ENDNOTES

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CHAPTER 10

CONFLICT MANAGEMENT PLAN

"The general guiding principle of risk allocation should be that the different parties involved should seek a multi-beneficial distribution of risk. A dominant party that off-loads all project risks onto others is unlikely to enhance the chances for a successful outcome."

Vega (1997)

A brother and a sister growing up in a construction business atmosphere both progressed in life taking different directions. Brock, the eldest, followed the example of his father and took over control of the family business in real estate development. His sister Kelly opted to work for the procurement office of the state government.

Brock has decided to venture into the hotel development business, a new area for him and the company. In the past, the family construction company has billed approximately US$ 40 million in construction costs. The projects typically range from US$ 1 to $10 million and include department and retail stores with an occasional restaurant. Funded partly by the developer and the rest by banks, the upcoming hotel project is estimated to cost US$20 million. Although new to the hotel business, the banks are willing to fund this project because Brock's reputation is excellent and he rarely loses money on a project.

CHAPTER LOOK AHEAD

WHAT IS IT? A Conflict Management Plan looks at each project individually to establish a set of criteria for manageing conflicts. It assesses how much conflict one will encounter, how severe each conflict might be, then presents cost effective ways to avoid conflict and curb these disputes. Similar to the contract documents it should be complete, unbiased, understood, and accepted by all parties involved.

WHO IS INVOLVED? Throughout the life cycle of a project, the owners, the owner's representatives, designers, lawyers, and contractors are responsible for designing, reviewing and revising it accordingly. No one person or entity should be responsible for developing this plan alone.

WHY IS IT IMPORTANT? Designing a conflict management plan compels the owner to contemplate the conflicts that might arise. This will allow the owner to allocate responsibility and develop a plan to handle discrepancies. By doing this upfront and with each subsequent review, everyone involved has agreed to follow this plan, reducing the push for lengthy, costly court proceedings.

HOW TO APPROACH IT? Assess the project situation by identifying the sources of conflict that might occur. Analyze the severity and impact each of these conflicts might have. Match the conflict with a corresponding DART, to reduce or avoid the conflict. Draft the plan. Review and revise it as needed.

KEY CONCEPTS

This contract is awarded on a negotiated cost basis, plus a fee. About 90% of the design is completed and the contractor has been selected with the negotiated fee to be 3.5% of the total construction costs.

The other sibling, Kelly, has advanced to the rank of senior procurement officer for the state aviation administration. Her current project is a US$ 1.5 billion capital improvement program that encompasses 19 different contracts ranging from US$ 20 to 400 million. The contracts will be let at different times and almost all of the schedules are interdependent. The majority of these contracts are fixed price, design-bid-build projects, although some of these contracts have provision for operation and maintenance. This capital program is fast-tracked to expedite the process. The projects are broken up into different contracts so that design and construction of the overall program can overlap (i.e. construction of certain parts of a project will be underway, while other parts of the same project are still under design).

Each of these siblings are in charge of developing contract documents, in particular a conflict management plan, for their upcoming projects. These two very different 'owners' have dissimilar projects, however both have a great likelihood of encountering some type of conflict during the development of their projects and they are both concerned. How should each of them go about planning to identify, avoid, monitor and control these potential conflicts? How should Brock's approach differ from Kelly's approach? Could they both use the same methodology? Are there restrictions on what DART each of them could use?

10.1 CONFLICT MANAGEMENT PROCESS

Talk with anyone in the construction industry and ask them is there a project you have completed without any conflict? The answer 100% of the time will be no. Somehow, conflict creeps into every project, even ones that are self performed. Conflict has been defined in many ways, but generally, it is any action or circumstance resulting from incompatible or opposing needs. Managers in all area of business recognize that conflict exists, but the successful managers are the ones that implement strategies to avoid, control and monitor conflict in their projects. This is no different in the construction industry. These managers follow a number of common steps when developing a successful strategy to achieve these objectives. These steps are:

- Conflict Identification
- Conflict Analysis
- Design and Implementation of a Conflict Management Plan
- Monitoring and Review of the Conflict Management Plan

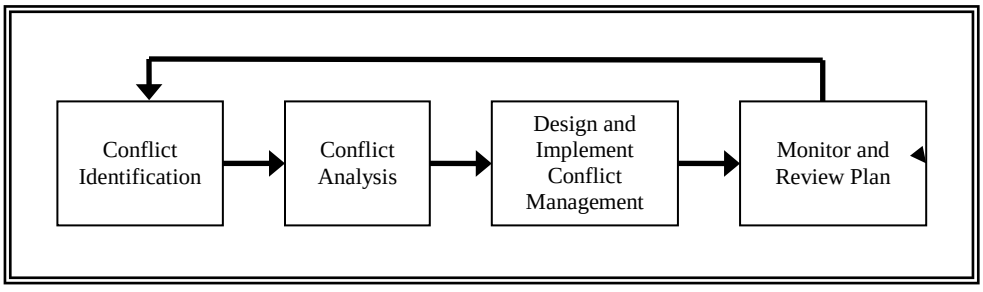
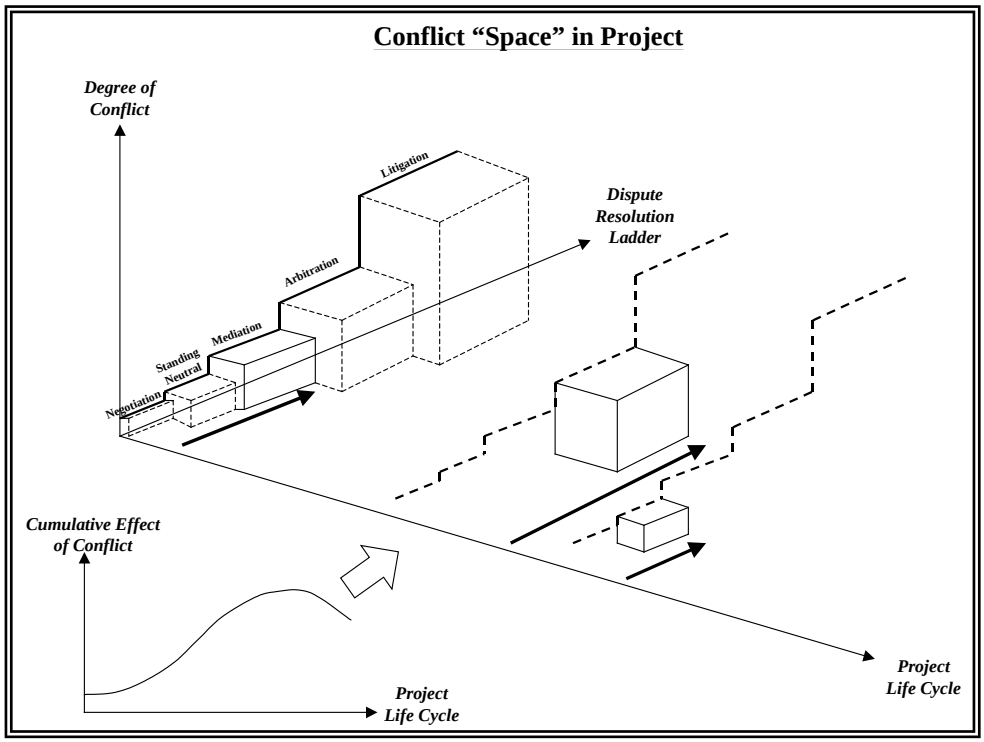


Figure 25 – Conflict Management Process

A Conflict Management Plan looks at each project individually to establish a set of criteria for managing conflicts. It assesses how much conflict you will encounter, how severe each conflict might be, then presents cost effective ways to avoid conflict, mitigate the impacts of the conflict that occur and resolve any disputes.

To understand the importance of a Conflict Management Plan one must understand how conflicts escalate during the life cycle of a project. As we know, various kinds of problems continuously arise during the course of a project. At any one time during the lifecycle of a project, there can be a number of ongoing problems, disputes, negotiations or conflicts. Some misunderstandings escalate up the "ladder" to cause more conflicts, influencing the conflicting parties for some period. Therefore, the amount of cumulative conflict is influenced by not only the amount of conflicts, but also by how these conflicts arise and are resolved.

Figure 26 – Conflict Space



Owners must be cognizant of the time at which the conflicts will occur. At any one point, there could be numerous conflicts at different stages of the dispute resolution ladder. The bottom half of Figure 26 shows the effect of multiple ongoing disputes as the project progresses. The Conflict Management Plan must be able to handle such scenarios. For example, there could be five potential change orders in negotiations while two others have escalated to arbitration and the designer is evaluating four other proposed changes as a neutral advisor. The notion of conflict space should be kept in mind throughout the design process, especially when identifying possible conflicts, to be managed during the development of the project.

10.2 IDENTIFYING POSSIBLE CONFLICTS

To address conflicts on a project, we must first accept that conflict occurs even in the best-managed project and identify what kind of conflict a project may encounter. To help identify the conflicts that surface in a project, review the common sources of conflict in Section 1.1, accepting these as the major sources of conflict on any given project.

Table 14 – Sources of Conflict and Dispute

Area	Discipline	Sources of Dispute
Organizational Issues	Structure	Internal/external organizational structure, delivery systems, inappropriate contract type, contract documents, contract terms, and law.
	Process	Performance, quality, tendering pressures, payment, delays, disruption, acceleration, tendering pressures, administration, formal communication channels, information sharing, reports, and poor communication.
	People	Misunderstandings, unrealistic expectations, culture, language, communications, incompatible objectives, management, negligence, work habits, and lack of team spirit.
Uncertainty	External	Change, variations, environmental concerns, social impacts, economics, political risks, weather, regulations, uncertainty, and unpredictability.
	Internal	Incomplete scope definition, errors in design, unforeseen site conditions, construction methods, and workmanship.

This list encompasses the major sources of conflict in the construction industry, but a individual project will not necessarily encounter all of these disputes. If the project does, then that may be an indication that perhaps it was not a good project to undertake. Identifying which of these conflicts have the potential to occur and have an impact on the project is the hardest step in the process of designing a Conflict Management Plan.

10.2.1 EFFECT OF DELIVERY SYSTEM ON IDENTIFYING CONFLICTS

Refering back to Chapter 1, we see that the selection of an appropriate delivery system has a major influence over the type of conflicts that will arise in a given project. When looking at the organizational structure and comparing the various relationships as shown in Table 4, one may find that certain delivery systems are more prone to certain type s of conflict situations. For example, if we take Stephenson's (1996) construction conflicts, we can identify which of them may be realize at the interfaces between the multiple participants in an agency management delivery system (see Figure 27). One can eliminate certain conflicts against the relationships among the owner, designer, CM and trade contractor in a various situations if one selects a different delivery system. By doing this exercise, one can find which conflicts are likely to surface according to the delivery system selected.

		Owner-Designer	Owner-CM	Owner-Trade Contrac	(CM-Trade Contracto
1	Approval processes			+	+
2	Back-charges			+	+
3	Being a good off-site neighbor				
4	Being a good on-site neighbor				
5	Closing out the project			●	+
6	Communicating with others				
7	Constructibility				+
8	Construction document quality			+	+
9	Contract interpretation			+	+
10	Cost growth		+	●	+
11	Decision making				
12	Documents and documentation	+		+	+
13	Equipment and material problems				+
14	Financial matters				
15	Inspecting and testing			+	●
16	Issue, conflict, and problem resolution				
17	Job management				
18	Labor conditions			+	●
19	Legal matters	●	+	●	●
20	Maintaining regular project evaluations				
21	Organization, authority, and responsibility				
22	Paperwork and administrative work	+	+	+	●
23	Payment processing			●	
24	Personal quality and problems				
25	Planning and scheduling			+	●
26	Policies and procedures				
27	Procurement of materials and equipment				
28	Program conditions				
29	Project cost structure			●	●
30	Quality management			+	●
31	Regulatory agency matters	●	+	+	+
32	Revision processing	+	●	+	+
33	Safety		+	●	●
34	Staff morale and attitudes				
35	Staffing and personnel				
36	Submittal processing	+	+	+	●
37	Substitutions and alternates			+	●
38	Time growth		+	+	●
39	Timely action				
40	Training				
41	User-group interaction	+	+	+	+
42	Value engineering				
43	Warranty conditions			●	
44	Weather conditions				
45	Work-site condition		+	+	●
	Scores of Each Realtionship	9	11	31	(36)
	Scores of Each Delivery System				(87)
	Normalized Scores	0.10	0.13	0.36	(0.41)
	Total of Normalized Scores				(1.00)

Figure 27 – Potential Conflicts in Relationships for Agency Construction Management Delivery System (conflict list from Stephenson, 1996)

The conflicts in relationships presented in Figure 27 are just one example of what the owner should be considering when identifying potential conflicts. A circle counts as two points and a plus counts as one point. A detailed list of conflicts could be generated by the company based on historical data or personal experience of the people involved in the project.

10.3 ANALYZING IDENTIFIED CONFLICTS

After studying the sources of potential conflict, one can begin to analyze them. This analysis should include the probability that these conflicts might occur, and the impact that each of these might have on the project.

Each of these sources of conflict has different probabilities of occurrence and impact depending on the project. Say for instance, you have an owner and a contractor that have worked together in the same geographic region for several years; chances are that the probability of misunderstandings, unrealistic expectations and poor communication are low. Compare this situation to an owner who ventures into a neighboring state or country working with an unfamiliar contractor, the probability of occurrence for the same sources of conflict are higher. This varying outcome is also true for the impact of conflict as well. For example take two similar light rail projects, one delivered Design-Bid-Build and one delivered Design-Build, and then introduce a design change halfway through construction. Typically, the impact will be greater on the DBB project as the flexibility to change the design is considerably lost without a significant impact once the owner awarded the project to the contractor based on the lowest bid. The designer and the contractor will need to work closely together in incorporating the changes. In addition, the designer may not have the resources available to handle these changes after completion of design, because personnel have moved on to new projects. The Design-Build delivery method would typically offer greater flexibility in changing the design after construction begins, because the designer and the contractor are on the same team and their priorities for this project will be aligned, minimizing these impacts.

Going back to the characteristics of the construction industry (Section 1.1), no two projects are exactly the same. For this reason, a conflict management plan should be developed for each project based on the individualistic conditions. The circumstances that surround the project affect the probability that certain conflicts will arise and the impact that they may have. There is no standard way to evaluate conflict, although there have been attempts, it must be done on a project-by-project basis. As with all studies and predictions, the results are only as reliable as the data entered by the user. The “owner” should complete a thorough discovery of the project circumstances in order to determine an accurate prediction. In this situation, the word ‘owner’ collectively represents the owner, owner’s consultant or other authorized representative. The following sections aim to identify the probability an owner will encounter certain conflict and the impact each may have. Both are equally important in determining the conflict that needs to be managed.

10.3.1 PROBABILITY OF OCCURANCE

The probability an owner, contractor, subcontractor or designer will encounter conflict in general on a project is a given. With this understood the questions they need to ask are; what types of conflicts will they encounter? Can they reduce the probability that these conflicts will arise? To do this we will begin to look at the common sources of conflict and the circumstances that affect their probability of occurrence. This important, yet often overlooked step is the start in creating a Conflict Management Plan.

Organizational Issues

Following the potential areas of conflict in a project as presented in Table 2 (repeated in Table 14), the first potential conflicts that should be explored are the Structure problems in the area of Organizational Issues. This area addresses how the project is arranged, delivered and contracted. To reduce the probability of a structural conflict the owner should match the appropriate organization, delivery system and contract type accordingly. When selecting the appropriate delivery system, it can be seen that certain methods work better in certain situations. In a project where there is a solid, complete, unambiguous design, the Design-Bid-Build is an excellent choice of delivery method. It allows a fair competition among many bidders who know exactly what needs to be built. Given these circumstances, contractors have little to misunderstand and the probability of claims are minimal. In the case where the functional requirements have been set, but design is not complete, and construction must begin, the selection of Design-Build might be more appropriate.

Table 15 through Table 17 relate some common causes of conflict to the probability of occurrence according to the project and its context. These generalizations begin to set boundaries where conflict tends to exists. These boundaries were chosen to represent a broad range of probability from low to high, which should be adjusted according to the project.

Table 15 – Probability of Encountering Structure Conflict

Source of Conflict	Probability of Occurrence
Organization	Low: Small projects, knowledgeable/experienced owner High: Larger projects, numerous participants
Delivery System	Low: A system that aligns objectives and properly allocates risk High: Adversarial 'Cookie cutter' system, unmatched for project
Contract Type	Low: Solid, proven contracts used on similar projects High: Standard, highly specialized or unreviewed contracts
Contract Documents	Low: Standard, universally accepted plans and specifications, CSI High: Specialized specifications, high end CADD systems req'd
Contract Terms	Low: Fair reasonable allocation of risk High: Unfair, unreasonable allocation of risk favoring one party

The owner will begin to get a sense of the probability that conflict will occur by looking at each of the sources of conflict, then rating them. The owner can do this on various scales, but again, the results depend on how accurate the information is. In the early stages, a simple high, medium, or low probability will begin to help for the management plan. Owners, designers, and contractors can use numbers as more accurate, historical information becomes available to them.

Once the structural conflicts have been analyzed, the focus is shifted to the Process problems. Owners can expect this type of conflict when handling a larger project if they have a small staff or have an inexperienced staff. For example, the processing of requests for information or request for payment from the contractor when handled inefficiently leads to claims.

Table 16 – Probability of Encountering Process Conflict

Source of Conflict	Probability of Occurrence
Performance and Quality	Low: Cost-Plus, quality driven projects, inspection staff High: Competitive bids award to lowest bidder, bad reputation
Payment Delays	Low: Payment clauses in contract and payment bonds High: Lack of qualified staff on owner's side
Disruption	Low: Backup plans or alternative approaches available High: Poor planning, strict schedule, no flexibility
Administration	Low: Qualified, adequate staff High: Unqualified, inadequate or overworked staff
Formal Channels	Low: Backed by contract, circular integration High: Vertically integrated with numerous steps
Information Sharing	Low: Open web based system, documentation is crucial High: Closed, non-documented random system

Rounding out the Organizational Issues is the probability of encountering conflict based on the interactions with People. Taking compatibility of objectives for an example, by introducing profit sharing incentives, a contractor is more likely to ignore frivolous claims. The probability that conflict will occur in this area is low when the participants' objectives are aligned. The reverse of this situation is a fixed price, low bid scenario. As the contractor starts to lose money, the probability of claims will be high, as the contractor hopes to offset these loses.

Table 17 – Probability of Encountering People Conflict

Source of Conflict	Probability of Occurrence
Misunderstandings / Communications	Low: Previous experience with participants High: Language barriers, unwillingness to communicate
Compatibility of Objectives	Low: Incentives, shared profit built into the contract High: Adversarial relationships
Management	Low: Long distinguish solid managers High: Inexperienced participants
Negligence	Low: Solid history that demonstrates 'reasonable care' High: Past history of negligence

Conflicts that arise from Organization Issues are vast and easily be predicted with a little bit of logic and solid planning. The importance of a solid organizational structure with an appropriate delivery system is paramount. Although some restrictions are put on various delivery systems for certain owners, research and past experiences can curb these limitations.

Uncertainty

The probability of certain types of Uncertainty, although an oxymoron, can be more predictable than most Organizational Issues. For example, if a contractor planned to do work in Vietnam they must account for time lost to weather during the rainy season.

Based on historical records, statistics can determine the average amount of rain that the contractor should account for. The same is true for earthquakes, floods, fires and other instances. Insurance is one of the options used to mitigate these unforeseen, but statistically predictable events. Other options include clauses in the contract for uncertainty such as adverse weather conditions, differing site conditions or a shortage in skilled labor.

Similar to the Organizational Issues, owners can look at the project circumstances and determine the probability relating to the types of Uncertainty conflicts that will occur. Looking at External uncertainty, environmental concerns in the world have been among the forefront of controversy and have grown exponentially in the Untied States since the passage numerous federal regulations in the 1970's and 1980's. Many owners found the impediments to build waste disposal sites overbearing. The "Not in My Backyard" philosophy has united communities and grassroots organizations who have repeatedly stalled owners in costly legal zoning battles and court proceedings. An owner building a waste disposal site should expect the probability of conflict to be high in the area of Social Impacts, Changing Regulations, and Environmental Concerns. Not taking these sources of conflict into consideration can be detrimental to a project.

Although rare in certain countries, political risks are highly probable in others. A perfect example of this is the country of Afghanistan during the 20th century, particularly during the Soviet invasion throughout the 1980's. As much as 80 percent of the country eluded effective government control. This included parts of major cities such as Herat and Kandahar. The likelihood of political risks occurring on a project approached 100%. This political instability in many third world countries is apparent and need to be taken into consideration. The probability and impact of this source of conflict sometimes does not offset the financial rewards, in these cases no development occurs. Take note that the International Bank for Reconstruction and Development (IBRD) division of the World Bank aims to promote projects with these circumstances, although excellent opportunities, participants should be aware of the risks undertaken in these projects and the probability that they will encounter conflict.

Table 18 provides a general gauge of the chances of encountering External Uncertainty based on various project circumstances.

Table 18 – Probability of Encountering External Uncertainty

Source of Conflict	Probability of Occurrence
Change	Low: Solid, well thought out design High: Cursory thought process and planning
Environmental Concerns	Low: Environmentally conscious projects High: Projects within environmentally sensitive areas
Social Impacts	Low: Site zoned for proper use in a consistent area High: Environmentally sensitive projects
Political Risks	Low: Work in areas with stable, well developed governments High: Newly developed governments or history of instability
Weather	High or Low probability of inclement or disastrous weather based on historical data
Regulations	Low: Documented, court proven and tested regulations High: New, unclear or constantly changing regulations

Consistent with External Uncertainty, participants can reasonably expect Internal Uncertainty depending on the surrounding situation.

Table 19 – Probability of Encountering Internal Uncertainty

Source of Conflict	Probability of Occurrence
Incomplete Scope Definition	Low: Well documented, unambiguous scope High: Inexperienced owners, lack of planning
Errors in Design	Low: Well reviewed contract documents, reputable designer High: Inexperienced, overworked designers
Unforeseen Site Conditions	Low: Open, above ground projects with adequate investigation High: Lack of subsurface investigation for all participants
Construction Methods	Low: Proven traditional methods used in construction High: Experimental, unproven methods, specialty equipment

Overall, the probability of encountering conflict is based of individual project characteristics. Once probabilities of certain conflicts are determined, one can begin to look the impact that each of these sources of conflict will have on the project and determine if they warrant a DART.

10.3.2 IMPACT OF CONFLICT

Concurrent with the probability of occurrence of a certain type of conflict is the impact that the conflict may have on a project. The impact is independent of the probability of occurrence, that is, the consequences of the conflict if it occurs would be the same if it did or did not happen. Determining the impact of a conflict is just as important as determining the probability of occurrence.

Some conflicts have a low probability of occurring but can have a significant impact on the project, such as conflicts due to natural disasters, prolonged strikes or major accidents. An example of this is the catastrophic failure of a 567-foot tall crane in the construction of Miller Park on July 14, 1999 in Milwaukee, WI in the United States. The stadium was designed to have a retractable roof. During the pick and placement of one of the 450-ton roof sections, the crane failed dropping the roof section, killing three ironworkers and effectively destroying ¼ of the completed stadium. This accident impacted the schedule, increasing the duration by a full year, and caused over US$100 million of damage. A number of factors, including high winds and the management's drive to get the project done, were determined by the experts to have caused the failure. Although the probability of conflicts due to this type of failure happening is very small, the impact can be enormous.

At the same time, there are numerous other conflicts that are almost a given on a project. The probability of them occurring approaches 100%, but the impact is almost negligent. Problems are resolved on a daily basis through negotiations with on site personnel, but they never escalate to the point of recognition. Issues such as scheduling, work-a-rounds, and other accommodations made between various project participants on site, happen daily. Impacts typically range from upset foreman to nasty letters from owners, but overall the impact is negligent. Negotiation is the most common DART used to resolve these types of conflicts, in particular step negotiations.

Quantifying impacts can be difficult. One way of doing so is to use historical data relating to similar instances. Another is through experience and knowledge of the industry. Initially, quantifying impact does not have to be 100% accurate, as each project is different, but the idea is to get in the general range so that decisions can start to be made about how much conflict the project is exposed to and what should be done to prevent it. A list of examples are presented in Table 20.

Table 20 – Examples of Impact on the Project

Source of Conflict	Impact on Project
Weather	Low: Construction 'friendly' environment High: Area prone to natural disasters
Errors in Design	Low: Well reviewed contract documents, reputable designer High: Inexperienced, overworked designers
Unforeseen Site Conditions	Low: Open, above ground projects with adequate investigation High: Lack of subsurface investigation for all participants
Construction Methods	Low: Proven traditional methods used in construction High: Experimental, unproven methods, specialty equipment

10.3.3 COMBINED CONFLICT EXPOSURE

The last step in analyzing conflict is calculating the combined conflict exposure. This is done by combining the probability of a conflict occurring with the impact that it may have. The combined conflict exposure is based on the probability that conflict in general or a specific type of conflict (c) will occur, P(c), and the resulting impact of the conflict occurring L(c). Combined conflict exposure can be done at numerous levels of detail, but the accuracy of this analysis is based on the amount of information available. Two examples are presented to give the reader an idea of the level of detail that this analysis can be performed. If little or no historical data is available, a crude system of high, medium, low can be used and can be divided into more possibilities depending on the amount of the information available.

For example, a homebuilder is considering constructing three new houses in a local subdivision. The builder has identified the probability of miscommunication with trade contractors as high. In addition, the impact of this source of conflict can be very high as well. As the builder starts to list various sources of conflicts and relating the probability that they will occur and the impact that each of these conflicts has, a combined risk exposure table can be developed (Table 21). From this analysis, the builder begins to get a sense of what conflicts need to be managed during the project and will be expanded upon in the following section.

Table 21 – General Conflict Exposure

Source of Conflict (c)	Probability of Occurrence P(c)	Impact of Occurrence L(c)	Combined Conflict Exposure
Miscommunication	High	Very High	High
Performance/Quality	High	Med	Med-High
Management	Med	Med	Med
Contract Type	Low	Low	Low

Another example where historical data is available presented in Figure 28. The bottom half of the probability tree shown in Figure 28 performs this type of analysis of conflict

exposure on a macro level, or that conflict in general will occur. This analysis is based on a $200 million project without any mitigation strategy. It predicts that there is a 40% chance of encountering conflict that will result in a $25 million impact to the project. There is a 50% chance that conflict on the project will result in a $5 million impact and a 10% chance that conflict on the project will have $1 million impact. In this case, it is assumed that the probability that conflict will not occur at all is negligible. The overall conflict exposure is therefore calculated to be $13.5 million.

The probabilities and impacts should be taken from past projects in the range of $150 - $500 million, adjusting the impact accordingly as a percent of the total construction costs. One could also attribute sources to the conflict and identify the impact associated with these sources. Individual conflict exposure analysis would then be done on each source of conflict. This involves more detail as there are usually several contributing sources affecting the impact. Care must be taken so that they the impact is distributed properly and not accounted for multiple times, unrealistically inflating the conflict exposure. By calculating the conflict exposure that is derived from each source of conflict, the owner can prioritize the sources of conflict that need to be addressed first, which will aid in designing the Conflict Management Plan.

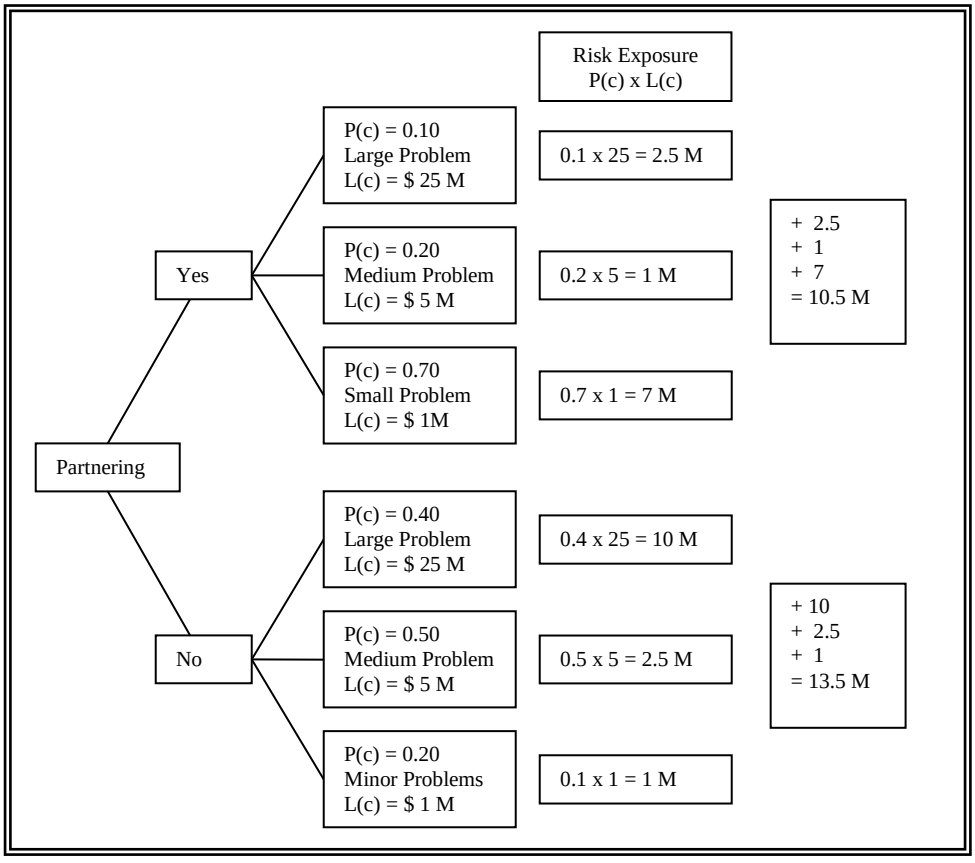


Figure 28 – Calculating Conflict Exposure

After calculating the conflict exposure, the same type of analysis can be done to calculate the conflict exposure with the application of various DART techniques. Again, based on historical data, an owner can predict the amount of exposure they will face from a source of conflict depending on what DART they implement. The top half of Figure 28 focuses on overall project conflict with effective Partnering (Section 4.3) as the chosen DART. It predicts that there is a 10% chance of encountering conflict that will result in a $25

million impact to the project if Partnering is used. There is a 20% chance that conflict on the project will result in a $5 million impact and a 70% chance that conflict on the project will only have $1 million impact. Therefore, the overall conflict exposure is calculated at $10.5 million.

In this situation, implementing Partnering reduced the conflict exposure by $3 million. Depending on how much it costs to employ Partnering, one can determine whether this DART should be used. The selection of the appropriate DART technique and the cost/benefit analysis is discussed in further detail in the next section.

Once the conflict exposure is calculated for each of the identified potential conflicts, they can be grouped into priority levels. They can be categorized into one of the following three groups according to a pareto optimal categorization:

Group A: 10–20% of the top conflicts with high potential of realization, which together account for roughly 60% or more of the total potential impacts the project.

Group B: all activities not members of group A or C.

Group C: large percentage of the bottom conflicts in terms of potential of realization, which account for 10% or less of the total potential impacts.

The conflict management plan can then be designed according to the priority. This is discussed in more detail in the following section.

10.4 DESIGNING THE MANAGEMENT PLAN

After assessing the probability of occurrence and degrees of impact that certain conflicts cause, it is time to develop a preliminary plan to mitigate these sources of conflict. The owner develops this preliminary plan based on their assessment of the project circumstances and their exposure to the identified source of conflict. In preparing for this planning, the owner must explore a range of options carefully weighing each one for the criteria of cost and benefit, keeping in mind which technique can better handle the conflict. The participants that the owner can allocate the management of certain conflicts to can be anyone of the stakeholders previously named in Section 1.2.1, such as the owner, designer, or contractor. In addition, other participants such as insurance companies or financial institutions services can handle certain conflicts more effectively. The following are the steps that need to be done when designing the plan:

- Prioritize the sources of conflict.
- Implement DART to avoid/prevent conflict using techniques in Stage 1 and Partnering.
- Implement DART to resolve conflict, using techniques in Stages 2 through 5.
- Identify each participant's role.
- Perform a Cost/Benefit Analysis of the Conflict Management Plan.
- Develop a contingency plan.
- Review with all participants and update as necessary.

After reading the previous chapters in this book, one should be aware of the different stages of dispute resolution. To optimize the Conflict Management Plan, apply these stages in order to reduce the probability conflict will occur and the impact that it will have. Keep in mind that not all of the stages will be used in a single project. As stated repeatedly, the Prevention Stage is the best opportunity to address conflict.

10.4.1 PRIORITIZING AND DART IMPLEMENTATION

Now that the major sources of conflict have been identified and analyzed, it's time to look at which of these conflicts need attention. This can be done in numerous ways, but a table incorporating the necessary information seems to work best. The first four columns of Table 22 incorporate the information gathered in the analysis of the conflicts identified (Section 10.3). The purpose of this table is twofold. First, it allows the prioritizing of conflict based on the exposure. Next, it begins to assign appropriate prevention strategies to address those potential conflicts. The management strategies used are those listed in the Prevention Stage (Chapter 3) and cost is the cost associated with each. The use of only prevention DART is because we are targeting conflicts before they occur.

Table 22 – Example of a Mitigation Plan List

Source of Conflict	**Probability of Occurrence**	**Impact of Occurrence**	**Conflict Exposure**	**Prevention Strategy**	**Resolution Procedure**	**Cost of Strategy**	**Reduced Conflict Exposure**
Organization							
Delivery System							
Contract Type							
Contract Documents							
Contract Terms							
Performance and Quality							
Payment Delays							
Disruption							
Administration							
Formal Channels							
Information Sharing							
Misunderstandings / Communications							
Compatibility of Objectives							
Management							
Negligence							

Once the preventative measures have been selected, a resolution procedure must be designed so that when conflicts do arise, the conflicts are addressed and resolved. This step in designing the Conflict Management Plan involves reviewing Stages 2 through 6 and comparing them with the characteristics of the project. In selecting an appropriate resolution procedure, one must ponder numerous questions about the individual project. How large is the project? What type of delivery system is used? How many parties are involved? Who should initiate the process? What is the chain of command? How are change orders handled? How crucial is the schedule? Should conflicts be resolved as soon as possible, or at the end of the project?

All of these factors and more shape the decisions made in determining this step. If schedule is of the utmost importance, an on-site representative or third party neutral can deliver solutions instantly. In addition, include a clause that all appeals must be filed when they arise and settled at the end of the job, and the fast track schedule will not be hung up on conflicts. If the project is of an unusually large size, an impartial DRB might be an alternative to a single neutral. There are pros and cons to every approach, as outlined in each chapter, but the intent here is to identify which ones will be appropriate to a given situation. In comparing these advantages and disadvantages with each project, a resolution procedure should begin to take shape. It is now time to apply the knowledge gained about the individual DART to a particular situation.

In addition to the application of DART, some other factors must be considered such as cost, other party's willingness to participate and clarity of procedure. The following section addresses these factors in more detail.

10.4.2 IDENTIFICATION: WHO IS RESPONSIBLE?

This process starts with the identification of possible conflicts and an agreement on who is responsible for addressing them first. Therefore, every party involved knows their role and there are no surprises or excuses when the conflicts do arise. Agreement on allocating the responsibility for conflicts upfront helps reduce and sometimes even eliminate finger pointing.

This identification currently is done in a variety of ways. The most common of addressing conflict has been in adding or modifying clauses contract. Another way is to identify them in the Conflict Management Plan (a part of the contract documents) and have each party sign the plan stating they are aware of and agree with their responsibility. In either case, the contract should be reviewed for conflicting statements that create ambiguities. These types of ambiguities (Organizational, Structural) often lead to litigation, as both parties involved identify with the conflicting clause or document that supports their claim. It is the owner's responsibility to develop a contract with no ambiguities. Confusion is reduced by eliminating them or defining which one takes precedence over the other.

In addition to identifying who is responsible upfront, the importance of good documentation cannot be stressed enough. A paper trail can be invaluable, when reviewing what when wrong and aids in identifying who was responsible.

10.4.3 COST/BENEFIT ISSUES

One thing that has not been mentioned before but is of great importance is the cost of implementing these conflict resolution strategies. It is safe to say that resolution of any conflict in construction is possible if cost is not an issue. With the invention of new and innovate dispute and avoidance techniques mentioned throughout this book, one must keep in mind that these techniques are only plausible if they bring value to the project. Is

a couple going to spend $20,000 on a partnering retreat with a contractor that is painting their house? Of course not. The costs far exceed the benefits, but on a billion dollar privately funded dam project, a $100,000 might be the best investment made if it helps avoid or resolve a $100 million claim. The participants must keep this in mind when designing the Conflict Management Plan.

One way to do this is by reviewing the combined conflict exposure developed when analyzing the conflicts and compare them with the cost of the mitigation strategy identified from the prevention stage. One should implement these techniques if the cost of the mitigation strategy and the resultant conflict exposure is less then no management strategy and its corresponding conflict exposure. Looking back at Figure 28, we can see an example of this. The calculated conflict exposure if Partnering is implemented on this project totals $ 10.5 M. On the other hand, if Partnering is not implemented the conflict exposure increases to $13.5 M. Assuming that the cost of implementing Partnering on this project is $0.5 M, it would make sense to do so. By applying Partnering to this project, $11 M is expected to be spent on disputes (10.5 plus the 0.5 spent on Partnering) compared to $13.5 M expected to be spent if nothing is done. In this case, it does make sense to put into practice the DART, but in others, it might not. If the cost of implementing Partnering were $3 M, it would not be optimal to do so.

If the data is not available to do this type of detailed analysis, one can use the high, medium, low approach. Referring back to the example presented in Section 10.3.3, Table 21 can be recalculated to account for the result that Partnering will have on the various sources of conflict. The cost of implementing this strategy can then be weighed against this analysis.

Table 23- Conflict Exposure after Implementing Partnering

Source of Conflict (c)	Probability of Occurrence P(c)	Impact of Occurrence L(c)	Combined Conflict Exposure
Miscommunication	Low	High	Med
Performance/Quality	Med	Med	Med
Management	Low	Med	Med
Contract Type	Low	Low	Low

This type of cost/benefit analysis should be done as a reality check when using these strategies. The cost of installation for some DART is negligent, while others can grow to be quite expensive. Keep in mind that cost does not merely mean monetary loss. Time loss and overall stress can also be a factor. It does not take into account for unquantifiable costs, such as the value of a good working relationship. Although some of these things might not be able to be quantified as a monetary value, they should not be overlooked.

10.4.4 CONTINGENCY PLAN

A contingency plan is nothing more than a list of options for both of the parties. These options should outline the strengths and weaknesses that the Conflict Management Plan has. As mentioned earlier, the cost of implementing various DART may exceed the benefit. Therefore, by not implementing these DART everyone must be aware that they

have conceded that conflict in this area may occur and no strategy is in place to prevent them from happening or mitigate their impact if they do occur. The contingency plan identifies these areas where conflict is expected to arise.

The contingency plan is also a backup in case of the unpredictable. In most cases, this is litigation and at times, litigation is the best contingency plan. Without the threat of litigation, some of the DART are not a viable option. Some participants out there would like nothing more than to tie a dispute up in court for years, whether or not they think they are going to win or lose. Dishonest owners who currently hold the money do not let it go without a fight. For a contractor this could mean bankruptcy if the project is long enough. In other instances, stubborn contractors feel that they are entitled to more then they really deserve, causing stress for the owner.

In general, the contingency plan is one more step in the "What if?" process. By taking this extra step, it keeps the participants from stumbling if a part of the Management Plan does not work as anticipated.

10.4.5 COMPUTER APPLICATIONS

Eventually the application of technology will aid in the process of designing a Conflict Management Plan. Preliminary models are being developed and tested, incorporating the information presented in this chapter. As research and development continues and more data is gathered, accurate functional models will be generally available to analyze different scenarios based on different variables and predict the amount of conflict that will occur on a given project. Different scenarios would be easily entered and modeled with minimal computation. An example of such a system can be in the DARTS system developed by Fenisoky Peña-Mora and Tadatsugu Tamaki at the Massachusetts Institute of Technology (Figure 29).

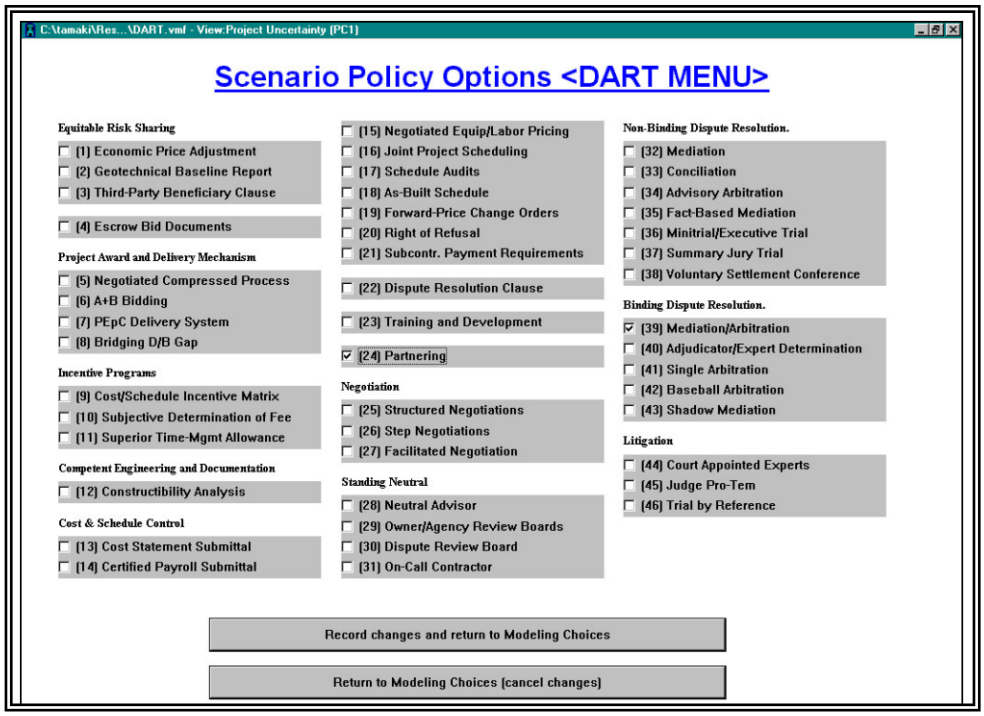


Figure 29 – DART Simulator Screen

In this application, project circumstances are taken into account and then the user can select different DART to minimize conflict on that project. Applications such as these will allow the users to review numerous scenarios and assist the participants in refining the Conflict Management Plan. This is especially important during and after the project is underway.

10.5 IMPORTANCE OF REVIEW

Sometimes going overboard on a plan not only increases the dollar costs of a management plan, but can ruin relationships, slow the project and lead to litigation quicker than having no plan at all. This is where review and acceptance of the plan by all the parties involved becomes important. For instance if a project has all six steps in the dispute resolution ladder, a contractor might be hesitant to bid on the job. If the claim goes all six steps, it might take years to receive money on a valid claim, possibly putting the contractor out of business.

Forcing a dispute resolution plan on a party forms an adversarial relationship from the start. From what we have seen, this leads to the lack of participation from the other parties, a key element in resolving conflicts. By including all the participants in the final decision of what conflict management plan to adopt, the interests become aligned and all are more willing to faithfully participate.

This review of the Conflict Management Plan should be done at various stages in the life cycle of a project such as planning, design, pre-bid meeting, award of bid, at project milestones, and project close-out. In the planning stage an initial concept should be developed, and refined in the design stage to be almost complete. Reviewing the plan during the pre-bid meetings (if any are held) provides opportunity to engage the contractors in the process as well as alert them to how conflicts will be handled before they bid on a project. When the award is made, the plan should be review thoroughly with all the parties involved. This review has two major objectives; inform all the parties involved, and make them a partner of the process. By making them a partner in the process, they are jointly responsible for the design of this plan, therefore, when conflict arises they are more apt to particiapte without protest.

Another important step at the project close-out is the overall review and effectiveness of the plan. If the plan did not work, ask the question, “Why?” Review the cost of each strategy that was implemented. This information will prove useful when designing the Conflict Management Plan for the next project.

10.5.1 CONFLICT RESOLUTION INDEXES

By using a conflict resolution index, it is easier to determine whether the Conflict Management Plan is working. A conflict resolution index takes into account certain data from the project that is quantifiable and returns a rating for the Conflict Management Plan. These indexes may include the number of negotiation, number of change orders, frequency of change orders, duration of negotiations, number of parties affected, satisfaction with result of change orders among others.

Table 24 – Proposed Indexes for Conflict Resolution
(adopted from Pena-Mora et al., 2001)

Indexes	Data Examples
Number of Negotiations	Number of negotiations taken place during the change order process
Frequency of negotiations	Project duration over number of negotiations.
Duration of negotiations in project	Total days of negotiations
Number of negotiations steps	Maximum number of negotiations steps in negotiation
Number of parties affected in negotiations	Number of negotiations over one issue
Satisfaction with the results	Trends over negotiated amount over proposed amount
Innovativeness or uniqueness of the outcome of negotiation	Differences from conventional results (e.g. integrated bargaining results over distributed ones)

As the project continues and relevant data is collected, it can be analyzed to identify where conflict still exists. Looking back at Figure 25, this part of the review process of identifying existing conflict completes the loop and begins the cycle of Conflict Management process again. A more detailed description of this process is depicted in Figure 30.

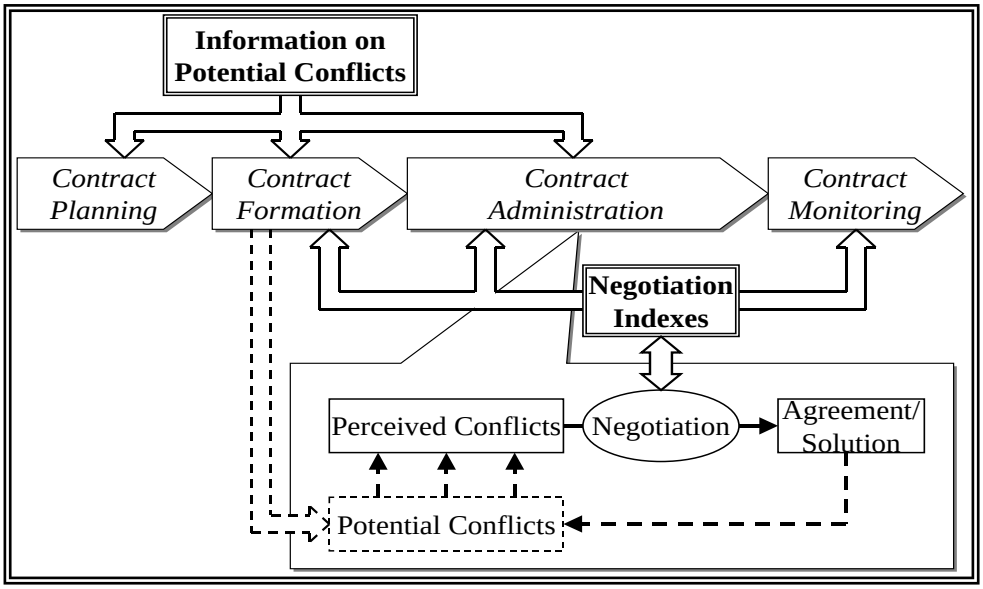


Figure 30 – Review Process (Pena-Mora et al., 2001)

This iterative process, if executed correctly, will reduce conflict on a project.

Brock and Kelly's Plan

Returning to the Brock and Kelly case, the siblings are facing the task of designing a Conflict Management Plan. Kelly identified the following as the major sources of conflict in the $1.5 billion program.

Table 25 – Kelly's Conflict Management Plan

Source of Conflict	Probability of Occurrence	Impact of Occurrence	Conflict Exposure	Prevention Strategy	Cost of Strategy	Reduce Conflict Exposure
Organization	High	Med	High	Program Manager	10	Low-Med
Performance and Quality (Life Cycle Costs)	Low	High	High	QC Inspectors	5	Med
Disruption	Low	Med	Med	Weekly Meetings	1	Low
Information Sharing	High	Low	Med	Web Based System	1	Low
Misunderstandings / Communications	High	Low	Med	Weekly Meetings	Included above	Low
Compatibility of Objectives	Med	Med	Med	Partnering	10	Low

By local regulation, Kelly was restricted to competitively bidding all of the contracts. To align the objectives, reduce miscommunication and disruption she decided to invest in a Partnering program. In addition to Partnering, she hired and independent Program Manager to help handle the load of the projects that the government agency is taking on. independent Quality Control inspectors were also assigned to the construction phase to watch over the contractor. A clause was added in the contract that requires the contractor to provide a Quality Assurance representative as well. Both of these personnel aim to reduce the Performance and Quality conflicts. Following the preventions aspects of the Plan, Kelly opted to use a DRB to resolve disputes that arise to reduce the impacts of these disputes. This was not included in Table 25 because it applied to all of the sources of conflict. The DRB panel will consist of 3 members, one appointed by each party and a third jointly select by the appointees. Disputes can be submitted to the DRB at any time during the project only after the parties have attempted at least three rounds of good faith negotiations, with or without a mediator paid for by the owner. The DRB panel has the power to issue binding solutions so as not to affect the schedule of other contracts.

Brock on the other hand, took a different route than Kelly. Not being too familiar with the hotel development business, he hired reputable contractors experienced in building hotel and added some incentive with shared savings. In addition, he hired a consultant knowledgeable in the hotel development business for the first project. Although this would cut into his profit a little, it would align the objective of the parties involved and reduce his exposure to conflict. Various clauses were added to the contract to share the risk of differing site conditions and adverse weather. Costly legal proceedings could

bankrupt a small developer such as Brock, so a binding Mediation/Arbitration clause was added to reduce the impact of the conflict if it occurs.

Table 26 – Brock's Conflict Management Plan

Source of Conflict	Probability of Occurrence	Impact of Occurrence	Conflict Exposure	Prevention Strategy	Cost of Strategy	Reduce Conflict Exposure
Compatibility of Objectives	High	High	High	Shared Saving	variable	Low
Performance and Quality (Life Cycle Costs)	Med	High	Med-High	Hire Reputable Contractors	0	Low-Med
Miscommunication	High	Med	Med-High	Shared Savings & Consultant	variable	Low-Med
Administration	Med	Med	Med	Consultant	1% of costs	Low

10.6 SUMMARY

The conflict management plan is one of the most important but often overlooked steps in the project. It should be conceived when planning begins and continue to be reviewed and revised throughout the project life cycle. The Conflict Management Plan is developed by identifying conflicts that might occur on the project, then analyzing the impacts that each will have. After prioritizing these conflicts, dispute avoidance techniques are applied to prevent the conflicts from occurring. Next, a resolution procedure is designed; focusing on the impact of the conflicts, so when conflict does occur the effects are minimal. All participants in the project should be involved throughout the process or as they are brought onboard.

These plans are individually tailored to each project. The implementations of the DART are done on a cost versus benefit basis. Although it is virtually possible to resolve every conflict with money, it is not always effective. Quality of the final product and schedule must be kept in mind when performing the cost/benefit analysis.

By designing the Conflict Management Plan, all the participants in the project are forced to contemplate the conflict that they will encounter. This will allow the allocation of responsibility for each one of these sources of conflict before it occurs. This upfront distribution reduces ignorance and allows the responsible participant to effectively handle conflicts.

10.7 POINTS FOR DISCUSSION

10.1 If there is not a Conflict Management Plan, where do the parties turn for information if a dispute arises? What role does the contract play if a Conflict Management Plan is developed?

10.2 Do the sources of conflict overlap with each other? Are there certain sources of conflict that are interrelated?

10.3 When analyzing the possibility that a conflict might occur, where might an owner go to get information on this? Would this change if this were the owner's first project? How might an inexperienced owner determine the probability that conflict might occur?

10.4 What are the differences between probability of occurrence and impact of the conflict? Can they be combined into one entity?

10.5 Could the impact of a conflict be standardized across all projects, i.e. would the predicted impact of rain, earthquakes, and miscommunication affect all the projects the same or does it vary from project to project? Is this true for all conflict types?

10.6 How accurate should the probability and impact information be to design a Conflict Management Plan? How does this relate when weighing the costs versus benefits?

10.7 When would an owner incur costs for designing a Conflict Management Plan? What are the effects of the timing in which the owner incurs these costs? Should the contractor contribute money to the design and development of the Conflcit Management Plan?

10.8 What are the benefits of assigning risk and conflict responsibility to the appropriate parties before construction begins? Are there any drawbacks?

10.9 Discuss the importance of reviewing and revising the Conflict Management Plan. Does this create any problems? Is there any incentive for parties to actively review this plan or is this something that will only come up in the case of a dispute, after the fact?

10.10 Why include a contingency plan? Should this contingency plan be hard to implement? What might be some obstacles if a contingency plan is implemented?

10.8 REFERENCES

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10.9 ENDNOTES

none

CHAPTER 11

CASE STUDY: TREN URBANO PROJECT[1]

"…at the Construction Progress Meeting(s) or partnering sessions at which the Claim is considered, technical personnel of the parties, experienced in the discipline involved in the Claim, will endeavor diligently and in good faith to identify the issues involved, consider impartially the countervailing positions, and achieve a resolution of the Claim."

(Rio Piedras Contract, 1997)

The Tren Urbano Project is a light rail transit line being developed in San Juan, Puerto Rico. The first alignment of the project, Alignment 1 (Figure 32), is a 17.2-kilometer line including 16 stations with maintenance facilities and operations and the administration building. This first phase of the project was expected to be completed by November 2001 and to cost $1.5 billion. This project presents several peculiarities that made it perfect for the analysis in this book. It is a large-scale project, with an innovative procurement, multicultural and multiphase characteristics.

In this chapter, the history and a detailed description of the project are presented, including the parties involved and their contractual relationships. Following the

CHAPTER LOOK AHEAD

WHAT IS IT? The Tren Urbano Project is a light rail transit line being developed in San Juan, Puerto Rico. It is a large-scale project, with an innovative procurement, multicultural and multiphase characteristics. This first phase of the project was expected to be completed by November 2001 and to cost $1.5 billion

WHO IS INVOVLED? Key participants for this project include: Puerto Rico's Department of Transportation and Public Works (DTPW), Parsons DeLeuw, Inc., Federal Transit Administration, Siemens Transit Team, Daniel, Mann, Johnson and Mendenhall (DMJM) and Frederic R. Harris, Inc.

WHY IS IT IMPORTANT? This project presents several peculiarities that made it perfect for the analysis and application of the material presented in this book.

HOW TO APPROACH IT? Understand the project circumstances. Identify the potential conflicts. Analyze the potential conflicts. Design a conflict Mitigation Plan. Review and revise the plan based on project data.

KEY CONCEPTS

presentation of the background material, a hypothetical analysis is given to provoke thought and promote discussion. This analysis focuses on the material presented throughout this book. Keeping this in mind, read the information presented and how it relates to the techniques that are available for dispute avoidance and claim management. Our goal is to familiarize the reader with real-life applications of DART, so they may apply them to their current or future situations.

11.1 TREN URBANO PROJECT STORY

In 1989, Puerto Rico's Department of Transportation and Public Works (DTPW) proposed to construct a light-rail system called Tren Urbano. Parsons DeLeuw, Inc. was contracted to develop the conceptual design. In January 1993, a new executive team took charge of the DTPW and its Highway and Transportation Authority (PRHTA), to review the light-rail concept developed by their predecessors. This included a team of Puerto Rican engineering, architectural, and project management consultants, who joined forces with some of the best-known transit development and design experts in mainland United States[2].

In February of that same year the Federal Transit Administration designated Tren Urbano as one of four turnkey demonstration projects in the nation. The new DTPW team re-thought the Tren Urbano concept from the ground up and decided to set their sights on a world-class transit system that would be a model of advanced technology, quality design, and innovative project management (DTOP, 2000). In January 1994, they submitted a successful bid for Federal assistance to the U.S. Congress.

In April 1994, the Department of Transportation and Public Works signed a $42-million contract for General Management and Architectural and Engineering Consultant (GMAEC) services. The contract was with a joint venture composed of two leading transportation infrastructure development firms from the U.S. mainland and two Puerto Rican firms. The U.S. partners in the GMAEC contract were Daniel, Mann, Johnson and Mendenhall (DMJM) and Frederic R. Harris, Inc. The Puerto Rican firms were Eduardo Molinary and Associates (architects) and Barret and Hale and Associates (consulting engineers).

These four firms, together with more than 20 subcontractors, made up the GMAEC, which employed over 150 professionals representing diverse engineering, design, architecture, and project management specialties. The consortium moved into their project offices in October 1994. There they have worked hand-in-glove with the Highway and Transportation Authority's project oversight team, now organized as the Tren Urbano Office (TUO). The primary mission of TUO at this early stage was to carry out the planning and environmental permitting process, to develop partial plans and systems specification, and to structure a procurement process and assist the DTPW/HTA in carrying it out.

The Final Environmental Impact Statement (FEIS) was approved for publication in November 1995. On February 1996, the FTA approved it and issued a Record of Decision. Shortly thereafter, on March 1996, the DTPW/HTA signed a $307.5 million Full Funding Grant Agreement with the Federal Transit Administration. This agreement authorized the Tren Urbano to be included in the U.S. Department of Transportation budget presented to the congress each year for the next six years. The groundbreaking for the Phase I alignment was celebrated on August 2, 1996.

11.2 PROJECT DESCRIPTION

The Tren Urbano traverses three central municipalities of the San Juan Metropolitan Area: Bayamón, Guaynabo, and San Juan. About 60% of the alignment passes through three of San Juan's most densely populated urban centers: Río Piedras, Hato Rey, and Santurce (Figure 31 and Figure 32).

The population densities within one-half mile of the alignment range from 10,000 to 20,000 people per mile^2. Over 30% of the total regional employment, nearly 150,000 jobs, will be located within a third of a mile of the Phase I corridor. The project was designed to be 17.2 kilometers in length and have 16 stations, each one 138 meters in length, capable of servicing six-car trains. Ten stations will be elevated; four will be at or below grade in an open cut, and two will be underground. The system begins on elevated track in Bayamón, transitions to at-grade as it leaves the central business district of that municipality, continues at-grade through Guaynabo and into Río Piedras, descends into a tunnel section through most of Río Piedras, and finally returns to elevated trackway through Hato Rey.

Figure 31 - The Tren Urbano Master Plan.

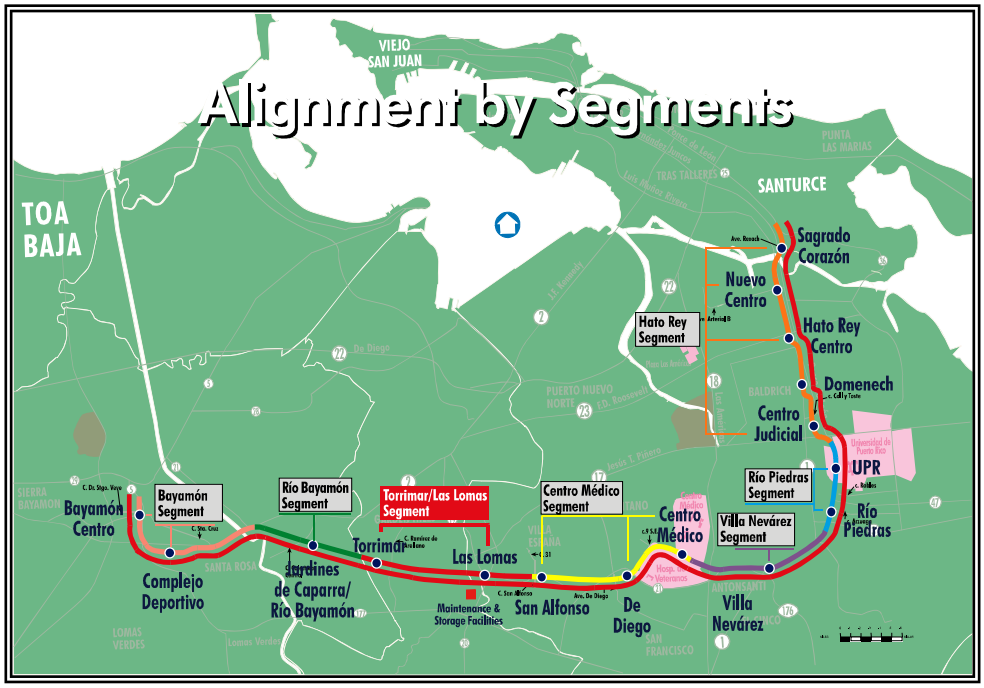

Figure 32 - Map of Tren Urbano Phase I alignment showing contract segments.

The project includes a maintenance and storage facility in the center of the alignment at Las Lomas, which will also be the location of the system's communications and train control system. Tren Urbano will offer operator-attended automated service via a double-track fixed guideway. The system will operate 20 hours per day, with vehicles providing four-minute operating headways during the morning and evening peak hours. Roughly 55 percent of all Tren Urbano riders will arrive at the transit stations via bus or the privately operated, non-subsidized público minivan service (private microbus public transportation system). Given the importance of such intermodal transfers, Tren Urbano stations are being designed to maximize integration of all modes, including pedestrians, públicos, buses, taxis, and private automobiles. Five of the stations will have park and ride lots and four will serve as transportation centers where the bus and público routes will be interconnected with the rail system.

The Puerto Rico Highway and Transportation Authority will purchase 64 transit vehicles for the Phase I line, with an option for another ten vehicles. The vehicles being built for Tren Urbano, by Siemens Transportation Systems, are advanced technology stainless steel heavy rail vehicles equipped with state-of-the-art AC three-phase propulsion systems and advanced signaling, monitoring, and diagnosis systems. Traction supply will be 750 V DC third rail, which was selected because it minimizes visual clutter and is less vulnerable to storm and hurricane damage than overhead wire catenaries. The cars will run as married pairs with seats for 72 passengers and a design capacity of 180 passengers per car. Each train will consist of one or more married pairs coupled together, up to a maximum train length of six cars. These will have a maximum speed in revenue service of 100 km/hour (60 mph).

11.3 PROCUREMENT STRATEGY

The FTA's Turnkey Demonstration Program is evaluating turnkey and design/build procurement methods for fixed guideway transit projects. The goal is to determine whether these alternative procurement strategies can expedite project development, reduce project costs, and more rationally allocate project risks and rewards between public transit entities and their private sector partners. The unique turnkey plus design/build strategy developed for Tren Urbano Phase I has shaved nearly two years off the project timeline. Tren Urbano is the national model demonstrating how these alternative approaches to transit system procurement can deliver top quality services and time saving. To ensure quality control, optimize technology transfer, the participation of local firms, and accelerate the start of construction, the DTPW divided the Phase I project into six design/build contracts for civil structures and one System and Test Track Turnkey (STTT) Contract. The STTT Contract provides for:

- Construction of two stations and 2.6 km of test track, the maintenance and storage facility, and the operations and control center,
- Delivery of train vehicles and systems,
- Systems integration, and
- System operations and maintenance for a minimum of five years.

As a result of dividing the alignment into segments, the DTPW was able to see preliminary construction activities get underway in August 1996. By the end of 1997 the Puerto Rico Highway and Transportation Authority had executed all contracts required for the design and construction of the Tren Urbano. Table 27 summarizes key data on the alignment segment and turnkey contracts.

Table 27 - The STTT and Alignment Section Contracts at a Glance

Contract	Stations Facilities	Length Km	Consortium	Contract Value ($ Millions)
STTT Contract	Torrimar, Martínez Nadal, Maintenance Facility, Operations Control Center.	2.6	Siemens Transit Team	612.5
Bayamón	Bayamón, Deportivo	2.9	Grupo Metro San Juan	71.5
Río Bayamón	Jardines	1.7	Redondo – Entrecanales	37.9
Centro Médico	Las Lomas, San Francisco, Centro Médico	2.5	Redondo – Entrecanales	74.1
Villa Nevárez	Cupey	1.9	Redondo – Entrecanales	71.8
Rio Piedras	Rio Piedras, Universidad	1.8	Grupo Kiewit (KKZ/CMA)	245.3
Hato rey	Piñero, Domenech, Roosevelt, Hato Rey, Sagrado Corazón	3.6	Redondo – Entrecanales	125.8

A summary of the hybrid delivery methods used in Tren Urbano can be seen Table 28. Below the table are descriptions of how the Tren Urbano Project uses each of the delivery methods.

Table 28 - Types of Procurement included in Tren Urbano Hybrid Approach

	Types of Procurement	Party	Also referred to as
1 2	Turnkey DBOT	Siemens Transit Team (STT)	Turnkey Contractor
3	Construction Management (at no risk)	GMAEC	Owner's Consultants
4 5	Multiple Primes Design-Build	Alignment Section Contractors (ASC)	Civil Contractors

1) Turnkey Contractor. One entity develops and delivers the project to the owner as one package. Essentially the owner buys the complete project from one organization. In Tren Urbano, STT is responsible for the complete integrated project.
2) Design-Build-Operate-Transfer (DBOT). The same entity designs, builds and operates the project. In Tren Urbano, STT does the design, construction and operations.
3) Pure or Agency Construction Management (at no risk). The owner holds the contracts with the designer and contractor(s), but another agency manages the contracts in behalf of the owner. In the Tren Urbano Project, GMAEC performs construction management for the owner, but they do not hold contracts with any of the designers, constructors or operators and therefore are not exposed to any risk.
4) Multiple Prime Contractors. The owner first hires a designer, and then procures several contractors. In the Tren Urbano Project, there are seven prime contractors.
5) Design-Build (DB). The design and construction is procured as one entity and the construction starts before the design is finished. Often the same entity or partnership does both design and construction. In the Tren Urbano Project, the civil contractors perform design together with construction.

The contractual layout of parties in the Tren Urbano Project using this hybrid delivery method can be seen in Figure 33. It can be seen that the owner, the Tren Urbano Office, has direct contracts with their consultants, the ASC's and STT, and STT has no contractual relationship with the ASC's.

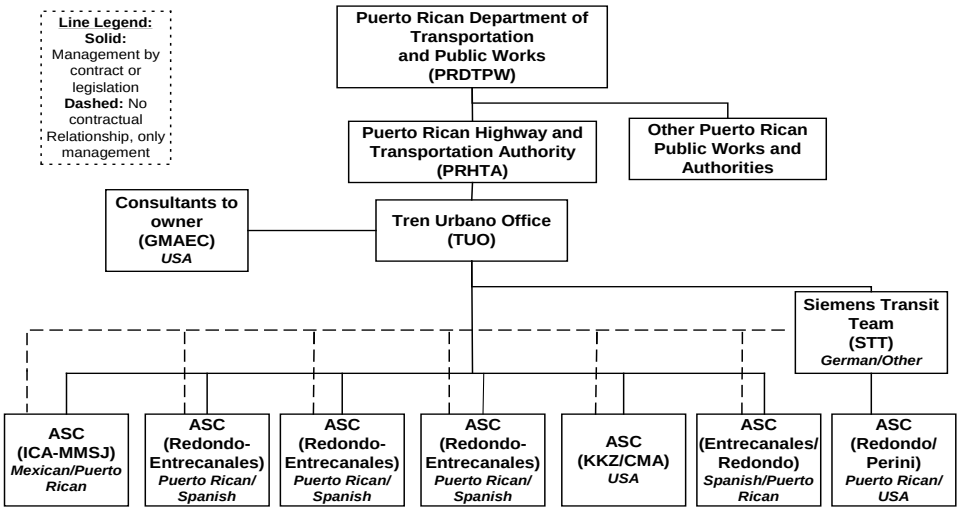

Figure 33 – Organizational Chart for Tren Urbano

Since the procurement strongly affects the formal and informal relationships between the parties, it is important to carefully consider its implications.

11.4 CONFLICT MANAGEMENT IN TREN URBANO

Three major items must be mentioned regarding conflict management in Tren Urbano, the Partnering Implementation, the Change Order Process, and the Dispute Resolution Contract Language.

11.4.1 PARTNERING

The design-build agreement for each section of the Tren Urbano project states (Rio Piedras Contract, 1997):

> *" To promote the development of effective working relationships among the Contractor, key Subcontractors, the Authority's Representative, the Contracting Officer and the Authority, to promote cooperation and trust, and to achieve common and individual objectives on a non-confrontational basis, the Authority encourages the use of Partnering techniques during the course of the Contract. Within thirty (30) days after the date of execution of the Contract, the parties shall participate in a partnering workshop. The Contractor's key on-site staff and Authority personnel shall follow the initial workshop. Follow-up workshops will be held periodically as agreed to by the Contractor and the Authority. The Authority shall be periodically responsible for the expenses of conducting the initial workshop and any follow-up workshops; provided, however, that each participant shall be responsible for the cost incurred by the attendance and participation of its own representatives. Facilitators for partnering workshops shall be retained through the partnering program of the American Arbitration Association. The parties will participate in partnering sessions with each other and with other Project Contractors, as necessary, to facilitate the progress of the work of the Project Contractors and to resolve disputes."*

11.4.2 CHANGE ORDER PROCESS

The change order process is used to document, evaluate, negotiate, disposition and issue change orders in Tren Urbano. The complete change order process is composed of four major sub-processes – Initial Notice, Contractor Change Request, Authority Change Request, Change Directive, and Change Order [Rio Piedras Contract, 1997]. For a Change Order to occur not all of the sub-processes listed may be needed.

The Contractor Change Request process starts with the contractor submitting an Initial Notice (IN) to the PRHTA/GMAEC that a change order is due (Figure 34). Within 10 days of the IN, the contractor must submit a complete estimate to complete the change and an updated schedule of the change with documentation of its merit in the form of a Contractor Change Request (CCR). Usually the CRR is not filed within 10 days and the contractor, which is usually approved by the PRHTA/GMAEC, files an extension. Now the Contract Manager together with Technical Services, Project Controls, and the legal team of the owner (PRHTA/GMAEC) determines whether the CCR has any merit. If the CCR has no merit, it is returned to the contractor; otherwise the CCR follows the Change Notice (CN) or Change Directive (CD) process.

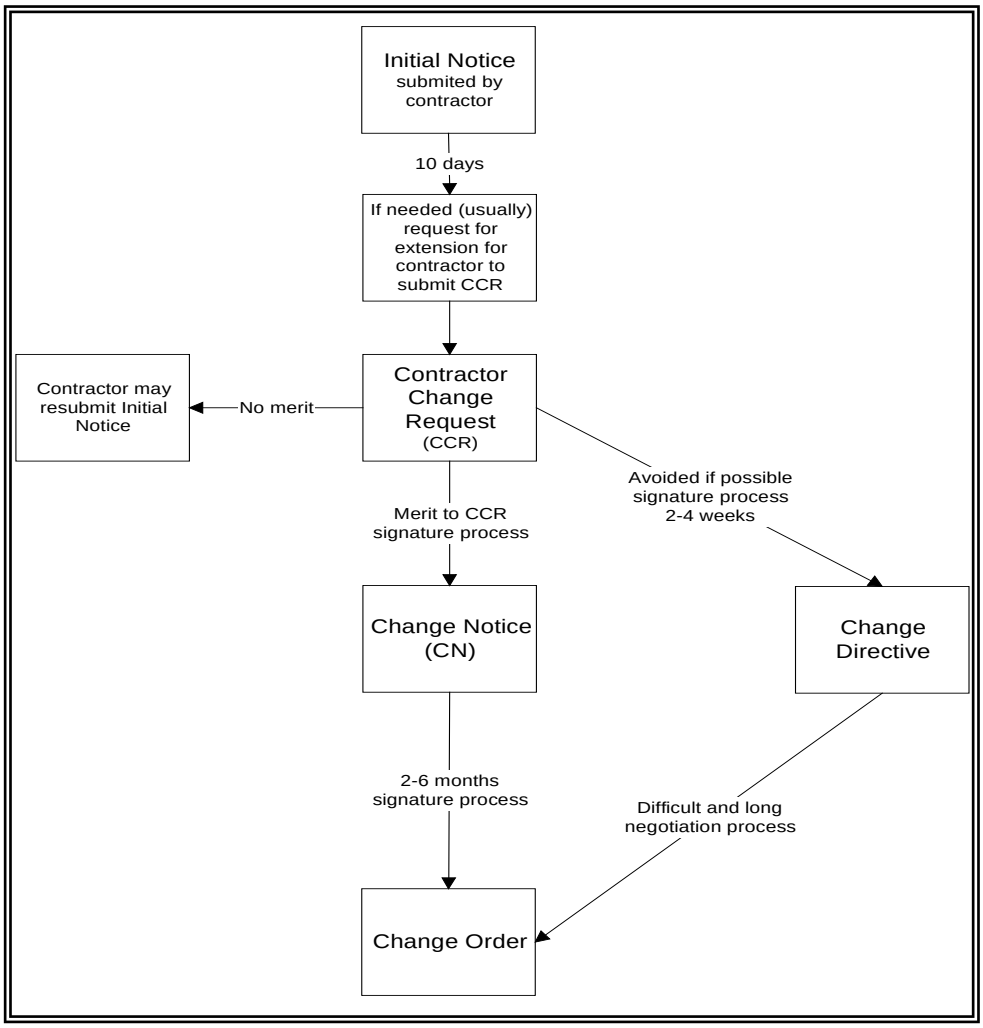

Figure 34 - Process for Contractor Request for Change (CCR)

A CCR becomes a CD if it is determined that the contractor needs to start the work immediately and the cost, time and technical impact evaluations will be negotiated after the CD has been issued. This direction is avoided, as the negotiation process later becomes more complicated and could be more costly for the PRHTA. After the CN or CD has been approved, a Change Order (CO) must be negotiated and the cost, time and technical issues must be approved.

The technical issues, cost, and time must be negotiated for both the CN and CD between the PRHTA/GMAEC and the contractor. Usually the technical issues are quickly resolved. There seems to be an inclination not to give the contractor schedule extensions if possible, even it is means increasing payments to the contractor. The cost of the change is usually what lengthens the negotiation process. On the PRHTA/GMAEC side, the Contract Manager makes the final recommendation. Final approval occurs during the signature process.

The signature process referred to is the procedure to obtain the signatures of a list of project participants who must review and approve the package (Figure 34). The order in which the signatures are received is not prescribed; however the list can be up to 10 people from the Contract Manager to the Secretary of Transportation. Initially the Executive Officer (Director of the PRHTA) had the final signature, however in early 1998, the Secretary of Transportation signature became required as well. As the Secretary has many other projects to oversee, to obtain his signature as well as the Executive Director's is a lengthy process. This may add time to an already lengthy process for gathering signatures, for example a CN often takes 2-6 months to be approved. There the signature process, as a sub-process of the change order process, can be a bottleneck. Now the contractors and PRHTA/GMAEC must work together to avoid delays while the change order is being processed.

When a change order starts, a new negotiation process is beginning. The minimum number of participants is two: the contractor and the owner (represented by the contract manager of the section). For practical purposes, the submission of the initial notice (IN) will be considered the start point of the negotiation (i.e.; the first step). This assumption may not always be true: the contractor might call the contract manager to inform him of the situation before an initial notice is filed, or the contract manager might have obtained information concerning the problem beforehand. Therefore, in most of the cases the negotiation process starts before the official submission of the IN, because the parties have been preparing themselves for the negotiation for some time. This "preparation time" is between two to ten weeks.

11.4.3 DISPUTE RESOLUTION CONTRACT LANGUAGE

Despite delays that may occur, the change order process itself can deal with a given problem and end up finding a solution. However, the owner is the one that finally determines if the change order has merit or not. If the contractor does not feel satisfied with the outcome of the process, he or she may ask for a revision of the decision. If this happens, it is said that the contractor asserts a claim.

The Design-Build agreement for each section in the Tren Urbano Project has a whole article dedicated to Claim and Dispute Resolution (Rio Piedras Contract, 1997). It states the directives the parties shall follow to resolve claims and disputes.

Step Negotiations. If a claim is asserted by the Contractor of the Authority, the matter shall be placed on the agenda of the next Construction Progress Meeting, and shall be specifically identified as a Claim:

> *"…at the Construction Progress Meeting(s) or partnering sessions at which the Claim is considered, technical personnel of the parties, experienced in the*

discipline involved in the Claim, will endeavor diligently and in good faith to identify the issues involved, consider impartially the countervailing positions, and achieve a resolution of the Claim."

These technical personnel have a maximum time of sixty (60) days to resolve the claim. After that, the matter will then be submitted to the Contractor's Project manager and the Contracting Officer for resolution. If the Contractor's Project manager and the Contracting Officer are unable to resolve the matter within ten (10) workdays, either party may then refer the Claim to the Contractor's Project Executive and the Executive Director. These senior executives shall meet within ten (10) workdays of such referral and shall endeavor to resolve the Claim. If the Contractor's Project Executive and the Executive Director are unable to resolve the matter within such ten (10) workday's period, the Contracting Officer shall, within ten (10) workdays, issue a written determination (a "Claim Determination") to the Contractor describing the Authority's position with respect to the Claim. If the Contractor disagrees with a Claim Determination issued by the Contracting Officer and gives written notice of such disagreement to the Contracting Officer within ten (10) workdays after the date of the "Claim Determination", the Claim shall become a "Dispute". Therefore, the contract establishes five negotiation steps the parties shall exhaust before a Claim becomes a Dispute. Figure 35 shows graphically the negotiation steps as a function of Time.

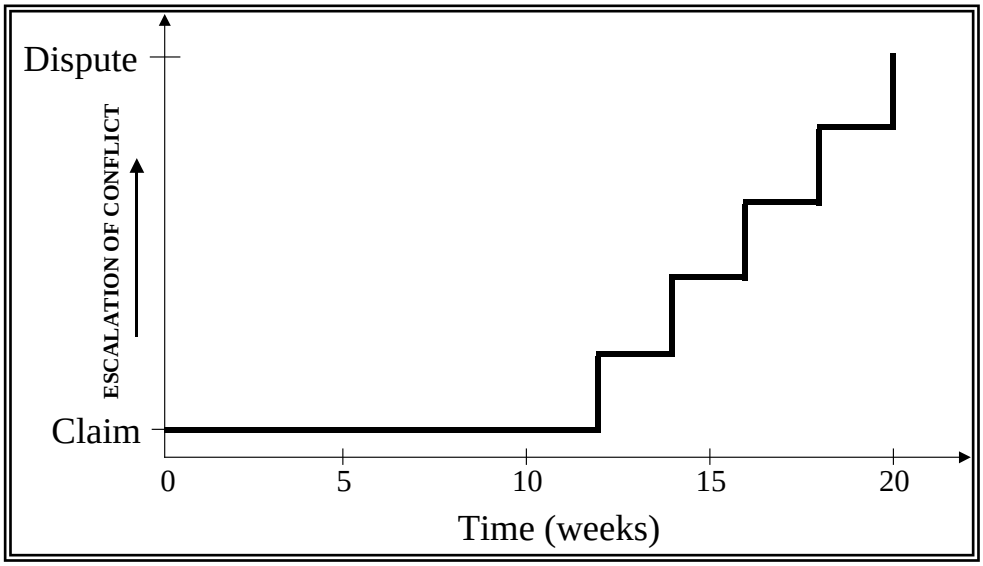

Figure 35 - Negotiation Steps required by Contract before a Claim becomes a Dispute

According to the Contract:

"At all time during the claim resolution process, the Contractor shall proceed with the Work diligently, without delay, in accordance with the Contract, shall otherwise comply with the Contract Documents."

Dispute Review Board (DRB). In order to continue with the dispute resolution process a DRB shall be established and shall consist of three members: One DRB member shall be selected by each of the Authority and the Contractor. They each shall nominate three individuals for membership to the DRB. Then, the Authority and the Contractor each shall select one individual from the other's list of nominees. The time horizon for this procedure is a month and a half. The third member of the DRB shall be a qualified and impartial Chairperson, who shall be selected by mutual agreement of the first two

members of the DRB within 21 days[3]. Therefore, the foundation of the DRB may take more than two months.

Processing Disputes. Within 45 to 60 days after receipt of a copy of the Contractor's request for a meeting and supporting statement, the Authority shall submit to the DRB and the Contractor (i) the Authority's response to the dispute, and (ii) any counterclaims the Authority has relating to the dispute. Within 21 days after receipt of a counterclaim, the Contractor shall submit to the DRB and the Authority a detailed statement setting forth each factual and legal defense to the counterclaim. Within seven days after the date of receipt of the Authority's answer or the Contractor's response to the Authority's counterclaim, whichever occurs later, the DRB shall set a date for an initial meeting on the Dispute. Then, within 30 days after the close of the meeting(s) on a Dispute, the DRB shall issue draft findings and recommendations to the Authority and the Contractor. Each party shall notify the DRB of a miscalculation or other error in the draft within 14 days, and the DBR has 14 days, after receipt of the parties' responses to the draft, to submit its final findings and recommendations to the Executive Director and the Contractor. Finally, within 30 days after receipt of the DRB's final findings and recommendations, the Executive Director shall issue a written decision either accepting or rejecting the DRB's recommendations. Then, the estimated time that requires to process a dispute is around six months.

Legal Action. Within 90 days after receipt of the Executive Director's decision, the Contractor may file a court action seeking a judicial resolution of the Dispute. If the Contractor does not file suit within such 90-day period, the Executive Director's decision shall be final and binding, and any further judicial review shall be barred.

Hence, the contract establishes all the steps that the parties shall pass through in order to search for a solution before reaching the ultimate step of escalation of conflict: litigation. These steps give us a time frame for the negotiation: the claim resolution process may last up to 20 weeks, and the dispute resolution process may last almost 6 months.

11.5 ANALYSIS OF TREN URBANO COMPONENTS

The Tren Urbano case presents many opportunities to discuss the strategy associated with this project. The following analysis is taken from an imaginary independent consulting firm. Their recommendations may or may not be in line with what actually happened as the project progressed. As mentioned before, the analysis is presented to provoke thought and discussion on the Tren Urbano project. This analysis is not presented to illustrate either effective or ineffective handling of the project. Keeping this in mind, we ask the readers to form their own opinions as they progress through the following sections.

11.6 PARTNERING ANALYSIS IN TREN URBANO

Effective partnering in Tren Urbano is very important in order to reap the benefits of its procurement objectives. Five reasons why partnering is especially needed in Tren Urbano, and projects like Tren Urbano, are outlined below:

- Enhance the Pros of Duplication
- Form a Unified Management Team
- STTT Contractor's Fiduciary Relationship With Owner
- Aid non-contractual relationships

- Improve communication and understanding between the multiple cultures on the project

11.6.1 ENHANCE THE PROS OF DUPLICATION

The management of Tren Urbano consists of several parties each with their own objectives, priorities and set of tasks that may at times overlap. Under ineffective partnering, the management would be inconsistent and competitive. On the other hand, the different perspectives can provide checks and balances that can be superior to a traditionally delivered project as the parties with different perspectives and aims can complete the task more thoroughly. If a team building effort is initiated, overall duplication of effort could also be minimized, as more information would tend to get shared. Duplication, however, is not necessarily something to be avoided. The pros and the cons must be evaluated based on the circumstances to meet the project objectives and partnering could elicit these situations (Table 29).

Table 29 - Pros and Cons of Duplication

Pros	Cons
Better quality check	Extra cost and potentially extra time
More parties involved, better end product	"All responsible, no one is"
Competition creates motivation	Competition can create an adversarial relationship

The Tren Urbano project aims at very high quality and, thus, chooses to have some tasks overlap to ensure the highest quality at what is perceived as a small price. It is assumed that effective partnering will overcome the obstacles of the cons (Section 11.5). These cons include competitive adversarial relationships and the phenomenon that often happens when too many entities are responsible for one task: one party assumes others will be performing the task, the others assume the first party is doing it, so therefore no one is. Hence, Tren Urbano relies on partnering in accomplishing its objectives, and effective partnering becomes especially important.

An example of duplication is that Parsons Brinkerhoff (PB), who is part of the Siemens group, performs much of the management functions in terms of interface between systems to fixed facilities and interface between fixed facilities. The owner's consultants, the GMAEC, also perform schedule and design reviews of the ASCs' work. Poor partnering may cause inconsistent comments from the management team to the ASCs, but with good effective partnering a more complete review can be provided than if only one party was involved in the review process. Thus, the integration and collaboration between GMAEC and PB will provide for a superior project.

11.6.2 FORM A UNIFIED MANAGEMENT TEAM

In order for GMAEC and PB to partner effectively, it is required that PRHTA and STT form a partnering bridge where PB and GMAEC can pass through as seen in Figure 36.

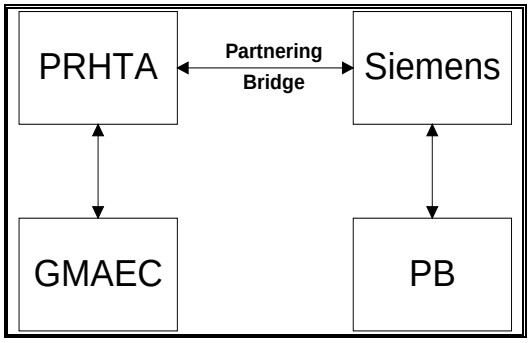

Figure 36 - Partnering Bridge in Tren Urbano

From this partnering bridge, cross-organizational partnerships can form a unified management that will improve the organization. This unified management is necessary in order to create a common management strategy and implementation. This is especially necessary in Tren Urbano because of the numerous parties involved in various contractual relationships that must work together on tasks that often overlap. Lack of a unified management team can cause such things as conflicting directives. Also, it can lead to further uncertainty in the project, as parties would have less knowledge of other parties who are not directly in the management chain of command.

11.6.3 STTT CONTRACTOR'S FIDUCIARY RELATIONSHIP WITH OWNER

For a more effective partnership between the owner, STT, and all other members of the Tren Urbano Project, STT should be perceived as part of the owner's management team. This can be accomplished by strengthening the owner representative objectives and priorities in the STTT contract.

The STTT contract characterizes the objectives and priorities for the STTT contractor in line with two contrasting viewpoints, as owner representative and as pure contractor. This occurs because the responsibilities of the STTT contractor include contractual obligations as well as aligning objectives and interests with the owner (Table 30).

Table 30 Two perceptions of STT

As Owner Representative	As Contractor
• Operations and Maintenance for 5-10 years gives incentives to reduce lifecycle costs • Oversees the ASCs interface with each other & interface with systems • Reviews ASCs' design & schedule • Partnering with PRHTA/GMAEC	• Design and construction of systems and vehicles (Major cost component of the STTT contract) • Design and Construction of one fixed alignment section

For instance, the owner's procurement strategy aim was to give the STTT contractor incentives to make decisions on the design and construction and to act in the *owner's interest* (i.e., to reduce lifecycle costs), since they will be operating and maintaining the project for five to ten years. On the other hand, the STTT contractor is responsible to design and construct one of the civil facility sections and all the systems such as train vehicles and control systems. These functions give incentives for the owner and the STTT contractor to have a more traditional owner-contractor relationship.

It may be questionable whether this dual role is possible or if the perception of STT tends to lean one-way or the other. Currently, many parties (TUI, 1997-8) actually perceive STT primarily in a contractor role. This may be because STT does not have a direct input and a binding mechanism for overseeing the ASCs such as a direct contract with the ASCs, which could pull STT more in the owner representative direction.

Alternatively, it is important for STT to act more like an owner than a contractor in order for the objectives and incentives to be aligned for effective partnering. Strong partnering will give the STTT contractor more authority to perform management functions effectively. Hence, the benefits of the turnkey contract can be gained as envisioned by the federal turnkey demonstration project.

11.6.4 AID NON-CONTRACTUAL RELATIONSHIPS

Aside from the important role partnering plays between the owner and STTT contractor, partnering is equally important in Tren Urbano with the ASCs. ASCs partnering with the owner can improve costs and schedule. Also, ASC partnering with STT is especially important because there is no contract between them. If partnering breaks down, the owner would stand between the various contractors, and the advantages of the turnkey delivery method would deteriorate.

11.6.5 IMPROVE COMMUNICATION AND UNDERSTANDING BETWEEN THE MULTI-CULTURES

Tren Urbano is being built in a multi-cultural environment as numerous parties are brought together by the delivery method. The multi-cultural environment can be viewed from several angles: multi-ethnical, multi-corporate, and multi-professional. In addition, Tren Urbano is concurrently in different development phases: planning for the next alignments, design and construction of Phase I alignment and preparation for operations and maintenance of Phase I. These multi-cultural and multi-phase categories may overlap, for example, the contract managers tend to be Puerto Rican and the design managers tend to be mostly North American. Hence, often the Puerto Rican versus North American issues are translated into design versus construction issues. This is important because each culture has its own way of conducting business and when combined with other cultures, parties may be less at ease, and the working relationship poses additional challenges.

For instance, a management team, which has worked solely with construction management, sees the need to cut the design review cycle down to improve the schedule of a design-build project. This may, however, cause rift with the design managers because designers consider a shorter deign review cycle as a compromise to the design quality. Each profession champions their work and may easily overshadow other professions' objectives. Likewise, among ethnic cultures, the contract language may be interpreted differently based on what is common in contractual relationships in the different home culture leading to many discrepancies and disputes.

These are examples for how the differences in culture can cause strains in the already complex set of relationships defined by the procurement strategy. Effective partnering can ease and/or prevent these strains. Effective partnering requires trust in the other parties; and with cultural differences, the partnering process becomes additionally challenging. This makes communication and understanding of other participants' objectives and priorities even more challenging. Effective partnering can improve communication and understanding needed for a smooth project.

Partnering has been officially established in Tren Urbano through initial partnering meetings. Initial meetings include conferences with each contractor separately, all designers together and a conference with all principals of the project at a Quality Summit in Oct. 1997. Partnering follow-up monthly meetings have also been held.

11.6.6 INITIAL MEETINGS

Partnering started out very promising with a series of initial meetings. They were held in a neutral location for 2-3 days for each contract with the owner. A member of the American Arbitration Association (AAA), an outsider to Tren Urbano, facilitated these meetings. Risks, concerns, goals, objectives were discussed in small mixed groups. These meetings fit the criteria for typical good-partnered projects. However, the benefits of partnering will only hold true if the harder to measure, "soft", criteria of partnering are also met. The soft criteria include genuine effort of all parties to developing trusting relationships. Then, only over time can the effectiveness of these initial meetings be measured.

A quality summit (TUQS, 1997) was also held in a neutral location (i.e., a hotel) for the purpose of all parties meeting each other and presenting how they planned to approach the Tren Urbano Project in terms of quality design, construction and management. The Tren Urbano Office, not a neutral facilitator, ran the meeting. Observations from this partnering meeting pointed out different issues that needed attention in the Tren Urbano Project. For example, the different parties mingled minimally between English-speaking and Spanish-speaking participants. This could be an indicator that further work needed to be done in cross-cultural relationships.

Observations from the quality summit also pointed out areas that needed more effort, for example, the drive and belief in partnering by some of the alignment section contractors. Observation from this meeting also pointed out that some human infrastructure was still needed. Design/build/operate projects like Tren Urbano do not have the time to develop personnel infrastructure like a design-bid-build then operate project because all personnel is needed in a more compressed time. This becomes an issue, as partnering has to occur concurrently with personnel being continuously added.

Although this conference was successful in delivering the message that quality was important to the owner, and how parties intended to approach the project, it did not focus on partnering issues appropriately. Thus, this meeting only had some factors of an effective partnering meeting: a neutral location, and some emphasis on how each organization would approach the project. To be an effective partnering meeting, a third party should have facilitated the Quality Summit and it should focus on working together in small groups instead of numerous presentations. Also, there needed to be more interaction between parties.

11.6.7 FOLLOW-UP MEETINGS

Monthly "partnering" meetings have also been held with all the project principals (TUI, 1997-8). These meetings were a good initiative, but instead of working on the partnering relationship, these meetings served as a way for the contractors to take a short cut to the regular issue resolution process bringing their issues to the top management directly without thorough analysis. The owner's top management typically ran theses meetings and other parties presented their status reports. Issues were resolved at these meetings, but at a micro-management level. Therefore, in an effort to improve these meetings and keep up the partnering spirit, the meetings are now being reduced to quarterly meetings. By keeping the meetings several months apart, project participants could not wait until the next meeting to resolve their issue as if the meetings were monthly. Thus, project

participants pursued other channels to resolve their issues and the partnering follow-up meetings then could focus more on partnering relationship issues. Tren Urbano could further improve these meetings by working on installing good communication processes throughout the project and increasing the commitment to the partnering process.

All these partnering meetings and initiatives were good initial steps to implement an effective partnering program. However, as expected, more has to be undertaken to achieve the greater level of partnering effectiveness because of the additional challenges of the project in terms of innovative procurement, multi-culture and multi-phase that creates an environment where continual revision and improvement needs to occur.

Evaluation on Partnering

The evaluation of partnering in Tren Urbano shows that there were areas where good steps toward partnering were taken such as the initial meetings, but some areas could be improved upon, for example:

- A clear champion for partnering was not clearly identified in the pre-planning stage.
- The initial partnering conferences were done well, but more faith and genuine commitment needed to be elicited in the partnering process.
- Follow-up meetings could be improved if run by a third party.
- The need for and the value of partnering should have been emphasized and explained better to all project participants.

More initial effort should have been put into the partnering venture. Once some deterioration of partnering starts, it may become difficult to reverse. Additional meetings should be hold in informal settings in order to gain better understanding of other parties' cultures in a relaxed atmosphere. Another major lesson learned was all management parties should form one united management team, otherwise STT would just be another prime contractor and not all the benefits could be gained from the turnkey concept.

Partnering should occur at all levels. For example, field inspection occurs separately by numerous parties. Partnering could help field inspection if teams were formed between the numerous field inspectors. This could ensure complete inspection in all areas of the work site whether the site was divided by location or by disciple. Partnering across many entities can also help form an environment where champions for quality, cost, schedule and partnering can foster. Champions can help lead a cause but can also create a clearer and more structured organization. The organization is currently somewhat confusing as is evident by the different perceptions of the organization chart by different entities. Tren Urbano also tends to have elements of micro-management, and this creates inefficiencies in the organization. One reason that micro-management starts could be that when management foresees many uncertainties they tend to take control of the issues. A trusting environment needs to be formed where delegation of responsibilities can occur.

The Tren Urbano project has many uncertainties and therefore more follow-up meetings are needed to redefine the partnering objectives and aims. The partnering process also needed to be evaluated more carefully earlier in the project to detect any decay of partnering relationships. Earlier detection of symptoms could have led to a better recovery. Today, the number of claims is increasing at a high rate and parties are starting to prepare themselves in case of court battles. Partnering may be a challenge to repair at this point in time. The partnering environment that still remains should be fostered until after the construction is complete and until all claims are settled in good faith negotiations. Then, a final evaluation of the Tren Urbano partnering efforts and results can be done.

11.6.8 GENERAL ANALYSIS OF PARTNERING COMPONENTS

The lessons learned from Tren Urbano can be generalized in order to apply them to any project, which uses an innovative delivery method in a multi-phase, multi-party, multi-discipline, multi-culture environment.

The lessons learned could be divided in three categories: initial, operational and resulting factors. The initial factors define how the remainder of the project will be carried out. They are set at the beginning of the project, but their impact will not be seen until the end of the project as they affect other factors. The operational factors occur throughout the project. They are affected mostly by the initial factors, but can also be improved slightly upon themselves. The resulting factors are mostly a product of the other factors. So although, conflicts, quality, schedule and cost of the project are more directly linked to the resulting factors, the initial and operational factors can have a larger impact than expected. These factors can all be seen in Table 31 and a brief explanation of each factor is given below.

Project Factors:

Initial Meetings: Start early with a full partnering initialization. Do whatever it takes, especially if the delivery system relies on partnering to become effective. A little extra time or money spent early on partnering may have a large pay-off later. Trust, as the key ingredient of partnering, must be developed here because it will only be more difficult to install later.

Education: Use experienced employees if possible, otherwise educate intensively in the need and benefits of partnering and, of course, at the task at hand.

Numerous Cultures: Cultural differences must be recognized and special seminars with played out examples of business differences may help parties see the differences before they are in real situations and their relationship deteriorates.

Delivery Method: An innovative procurement is done to meet special project objectives and can provide a fresh start for a new improved partnering relationship. But be careful, there may be special challenges such as non-contractual relationships that need higher commitment to partnering.

Table 31 – Summary of Issues/Lessons Learned

	Project (Initial) Factors	Operational Factors	Resulting Factors
Partnering Issues	Partnering Commitment Education Initial Meeting	Follow-up Meetings Evaluations Knowledge Transfer	Claim Management
Organizational Issues	Delivery Method Turnkey D/B/O Multiple D/B Construction Management Numerous Cultures Multi-Phase Multi-Professional Multi-Ethnic Multi-Corporate (uncertainties)	Turnkey Contractor Acting as Part Owner Unified Management Team Effectiveness of Champions Benefits of Duplication	Micro-Management Site Transfer Conflicts

Operational Factors:

Follow-up Partnering Meetings: Follow-up meetings can prevent the initial trusting partnering relationship from decaying.

Knowledge Transfer: Partnering can provide open communication for knowledge transfer that is often needed between various cultures

Evaluations: Evaluate partnering throughout the project. Thus, if there seems to be skepticism of partnering, this trend can be reversed immediately before becomes too difficult to reverse. Use more 'soft' measures initially such as problem solving methods, and evaluate 'hard' measures such as number of claims when it becomes relevant.

Champions for Objectives: There needs to be clear champions for quality, cost, schedule and partnering itself. A confusing organization may be a sign that nobody knows who is in charge of what and when. Party participants need to know who the champions are, and the champions need adequate authority to be effective.

Benefits of Duplication: The amount of duplication in a particular delivery method must be evaluated such as extra cost versus greater quality. How should parties with overlapping tasks work together? Partnering processes must be put in place here to ensure duplication does not lead to adversarial relationships and "all is responsible, nobody is" syndrome. If the delivery system is some hybrid of multiple primes with similar tasks, standardization with enforcement must occur.

Unified Management Team: Create a unified management team for highest effectiveness. Certain relationships may need to be bridged by partnering in order for other entities to work together effectively. Then partnering can occur at all levels.

Turnkey Contractor Acting as Part Owner: If a contractor is to perform tasks in the owner's interests as well as other tasks not as well aligned with the owner's interests, partnering can help pull the contractor to act more in the owner's interest.

Resulting Factors:

Site Transfer Conflicts: Hand-over between contractors may prove to be tricky. If there is no direct contractual link, the owner should oversee that the hand-over will be done in good faith; otherwise the owner would have to monitor site hand-over in detail.

Micro-Management: If the owner remains in control, it must spend great number of resources to oversee contractors in detail. Effective partnering will aid the process to letting go of control and save on resources. It will also make the owner more confident to use more innovative contracts for future projects. Trust must be developed so managers can delegate responsibilities in an uncertain environment and to avoid micro-management.

Claim Management: Claim management is important to improve costs, and schedule. Claim management, however, cannot only be improved upon itself; first the factors throughout the project, operational factors, must be improved upon through effective partnering in order to greatly improve claim management. The partnering effort must be emphasized after construction completion and all claims are settled.

11.7 GENERAL ANALYSIS OF CONFLICT RESOLUTION

The following paragraphs show the most important insights learned from the interviews and a summary of the data collected regarding conflicts in the Rio Piedras Section of the Tren Urbano.

Insights from the Interviews:

- Conflicts and Disputes are inherent to the construction business and they cannot be eliminated: The issues described above, such as the competitive environment associated to the construction industry, are imbedded in the business. Therefore, the goal is to learn from the conflicts and to escalate lowest possible step in the "Dispute Resolution Ladder".
- Owner and Contractor are disagreeing concerning how the project is running: This is a clear example of how negotiations are interrelated and they cannot be analyzed individually. The main reason why this disagreement exists is because each party has completely different point of view of the reality. From the owner side, this Rio Piedras contract is doing better than the rest. Then, the owner has the tendency to see this contract as a good one. On the other hand, from the Contractor point of view, the project is running far below their standards. Then, they have no reasons to believe that the project is OK.
- Mitigation Actions are most effective if taken early: Managers, based on their experience, realized how important the early actions are. The general procedures for partnering implementation described in Section 11.6 emphasize the necessity of early adoption. Once the competitive atmosphere is embedded in the project it becomes almost impossible to facilitate and/or enhance communication between the parties.

- Manager have a lot of experience regarding conflict management and they feel pretty confident about their negotiation skills: Project Managers, with more than 20 years of experience are reluctant to accept that they need help to deal with conflicts. However, the facts show that frequently managers obey their emotions and act irrationally in negotiation process. A tool that enhances their negotiation skills might be useful.
- Decision-Makers are not aware of the long term effects of their actions: The direct cost of a negotiation is always on the table. However, the hidden costs that can be several times higher are difficult to take into consideration. Hence, the short-term strategy generally prevailed over the long-term view.

11.8 SUMMARY

As newer and more innovative delivery methods are used in an increasing more global market, partnering becomes especially important to convey a sense of collaboration to all parties. Also, an innovative delivery method's advantage over traditional projects may ride on the assumption that effective partnering is in place. Therefore, in many projects special attention should be given to partnering.

In summary, partnering is especially needed in innovative procured, multi-cultural, multi-phase project. However, partnering can also be especially challenging because of the numerous other issues that must be resolved that can easily overshadow partnering if specific attention is not pointed towards partnering. Therefore, partnering has a singular role in Tren Urbano. It has been implemented in terms of initial meetings with the owner and each prime contractor and between all designers. A quality summit was also held with all parties. Subsequently, follow-up partnering meetings have been held with the principles of all parties involved in the Tren Urbano Project. Harpoth (1999) evaluated the effect of partnering in Tren Urbano. She concluded that the amount of partnering effort in the Tren Urbano Project is adequate for traditionally procured projects with few uncertainties, but it was not enough for the challenge of Tren Urbano. Much greater partnering effort is needed to receive the benefits of partnering.

Based on the insights received from the interviews and the data collected from the Rio Piedras Contract, a set of conclusions and recommendations is proposed for the Tren Urbano Project:

- Contract Language regarding conflict resolution is not the source of problems: Tren Urbano contract language regarding conflict management includes the-state-of-the-art dispute resolution techniques used in the construction industry. The source of conflicts is the disagreement that might exist between the parties, and this issue cannot be eliminated writing an article in the contract. Hence, the competitive environment cannot be eliminated through a statement in the contract.
- Inter-phase conflicts require additional efforts: Because of the characteristics the Tren Urbano Project has, it is very important to think ahead of the possible conflict that may arise between the current phase of the projects and its future phases. For example, the operation and maintenance of following phase can be awarded to a different entity.

11.9 FURTHER DISCUSSION

11.1 Incorporating the knowledge of a delivery systems (Chapter 1), how reasonable was the procurement strategy of the FTA (Section 11.3)?

11.2 Review the organizational chart (Figure 33). What problems, if any do you see? Is this structure similar to the LNGT case (Chapter 1)? Compare the successes of the two projects. What are the major differences?

11.3 What role does each of the participants play in the organizational chart (Figure 33)? Can any roles be eliminated or combined?

11.4 Is the change order process (Section 11.4.2) to complex? Why allot only 10 days to submit a CCR, when the entire process can take as long as 6 months?

11.5 Which processes in the Six Step DRL (Section 2.3.2) are represented in this project? Are there any other techniques that were implemented in this project?

11.6 Would such a change order process (Section 11.4.2) work in a small-scale civil engineering project? If so why? If not, are there any parts of the system that would?

11.7 What avenues does a contractor have if the owner feels the proposed CN does not have merit (Section 11.4.3)? Is this a fair process? Relating this to the importance of a neutral (Chapter 5), should a third party have been included in this stage?

11.8 Keeping in mind the partnering process (Chapter 4), did the partnering process (Section 11.6) align the interests of the contractors and owners? Who in particular did the owner target?

11.9 The STTT contract was procured as a turnkey project. How did this affect this procurement partnering process (Section 11.6.3)? How does this relate to the typical design-bid-build partnering process (Chapter 4)?

11.10 To what extent did the multi-cultural differences cause conflict? As construction globalization becomes more frequent, what role will these differences play in the future? Were these differences handled appropriately in this case?

11.10 REFERENCES

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11.11 ENDNOTES

[1] The authors would like to acknowledge the help of research assistants Jorge A. Giampaoli and Nina Harpoth for their contribution to the preparation of this case. Their research and insights are the basis for the material presented in this case.

[2] Prominent members of this group include Fred Salvucci, former Secretary of Transportation for Massachusetts; Dr. Nigel Wilson and Ken Kruckemeyer of MIT; Multisystems, Inc.

[3] Note that in the Dispute Resolution Process the time is expressed in calendar days rather than working days.

CHAPTER

12

SUMMARY

"If your only tool is a hammer, then every problem will look like a nail. When it comes to construction industry, the main dispute resolution tool remains the lawyer, and every disagreement still looks like a lawsuit."

(ENR, 2/15/1999)

This book on Dispute Avoidance and Resolution Techniques (DART) for construction and engineering projects presents how this industry is reacting to the increasing inefficient use of resources (e.g., monetary, time, and human) associated with the resolution of disputes using the court system, and for that matter arbitration. More importantly, it highlights that the industry has begun to realize that conflict is an important variable in construction. Thus, managing and resolving conflict should be added as a fourth key aspect to any project, together with Material, Labor, and Equipment. An effort has to be made to deal with and manage this additional variable efficiently and effectively. Parties must identify those characteristics that make their own projects prone to disagreements and implement a DART system in order to prevent them and/or mitigate their effects. Resources must be assigned to this task just as they are dedicated to scheduling or cost control. Accordingly, a project that efficiently and effectively manages its Material, Labor, Equipment, and Conflict will have much better chances of resulting in a successful venture similar to ones presented within this book.

After the assessment presented in this book, it is clear that the parties in the LNGT project presented in Case 1.1 failed to manage disagreements and find alternative ways to resolve disputes. Instead, the Venezuelan SUB, the Italian GC, and the British DESIGNER simply relied on contract terms to address the problems that developed during the project execution. Thus, many years after the project was finished, they were still involved in a large legal battle worth many times the original contract amount. Arbitration - the only dispute resolution technique included in the contract costed both parties more than 10% of the original contract value, and the final decision was in the hands of a third party. Furthermore, proceedings were managed and controlled by an agency external to both sides, located in a foreign country (i.e., US), who sets time frames and rules, and controls information exchanges. Direct negotiations to solve the claims were no longer encouraged, lawyers had taken over the dispute, and there was a significant amount of uncertainty with regards to the potential outcome, at least in the Venezuelan side.

The present work argues that the days of waiting until final completion to resolve disagreements between contractors, design professionals, and owners (like in the LNG case) are ending regardless of the location, type, or complexity of the project. Parties in construction and engineering endeavors are realizing the benefits of assuming a proactive role in dealing with conflicts and disputes. Parties are developing prevention techniques that foster an equitable allocation of risk, communication, improved contracts, and information flow addressing the basic characteristics of the industry that make it prone to disagreements. Court systems have witnessed a trend towards new methods that help overcome the difficulties of pre-trial hearings and motions during litigation. So, even

when litigation is underway, the industry and the courts have produced innovative practices (i.e., Court-Annexed Procedures) that can reduce the negative effects of legal actions (e.g., cost, time, resources, and broken relationships). Parties have seen their roles evolve from passivity and reaction to a dynamic, proactive attitude in the pursuit of dispute avoidance and resolution. The benefits of this new approach (e.g., early identification of problems, control over outcome, cost savings, and maintenance of relationships) far outweigh the ones of the practice of waiting until the project is completed.

The industry has made significant progress over the past decade in developing strategies and techniques to curb the adversarial attitude that had become a standard in most engineering and construction projects. Partnering and alternative dispute resolution methods, such as structured negotiations, mediation, Med-Arb, mini-trials, and dispute review boards have all become part of the industry. The use of these techniques has been pivotal for parties to anticipate potential disagreements and has revolutionized the traditionally defensive approach of the two-step Dispute Resolution Ladder reviewed in Chapter 2.

This 'quiet revolution' (Stipanowich, 1996) in dispute resolution has changed the whole scene of conflict in construction. The movement has placed emphasis on effective communication, informality, win/win approaches, and conflict avoidance, overturning the path of formalizing each process and legalizing design, relationships, information disclosure, and even problem solving. This confirms Treacy's (1995) point that the industry is returning to *"the old fashion way of doing business."*

Once understood that there is no unique formula to prevent or discourage disputes, the attractiveness of DART and every dispute prevention or resolution system is that they can be tailored to meet the specific needs and individual job characteristics of a given project and a given building team. This flexibility is invaluable for the construction industry, where each project is a new experience with new variables and different conditions. Parties can customize procedures and rules to what they consider the weak aspects of the project, helping to mitigate potential problems not covered in contract documents. The six-step Dispute Resolution Ladder (DRL) is the most appropriate model to base and design project actions based on specific project needs. However, this does not mean that every project requires a six-step DRL. As it was shown in the example of the Hong Kong Chek Lap Kok airport (Section 2.2.3), projects can have a three or a four-step DRL to facilitate the resolution process, and they can even choose to have more than one DRL, based on contract size, disputed amount, type, or source of disagreement.

Among the different stages of the DRL, this book considers the prevention stage as an important asset which offers the greatest flexibility to the project, in terms of designing and incorporating dispute avoidance and resolution techniques. Once disagreements are a fact, Negotiation (Stage 2, Chapter 5) is identified as the most effective method to resolve disputes in terms of time, costs, satisfaction, and minimization of further disputes, communication, and enhancement of job relationships. Given the definite move away from the adversarial approaches towards conflict avoidance and resolution, negotiation will certainly become the primary tool to deal with disagreements. The fact that Mediation, a form of facilitated negotiation, is becoming a highly favorable approach within the industry, confirms this conclusion.

Just as Negotiation and Mediation, this book concludes that the most efficient and effective ADR approaches utilize non-binding procedures, like Conciliation or Minitrials. These procedures are reinforced by the incorporation of a neutral third party that facilitates communication and/or helps resolve technical issues that might be part of the dispute. The Second, Third and Fourth stages of the DRL are the key sets of techniques available to avoid arbitration or litigation. Although these non-binding techniques might fail to result in a 100% resolution of the dispute, partial settlements are also important in

mitigating the costs and time impacts. Furthermore, communication during these phases can help clarify issues and might open the door to new solutions that might have been overlooked during initial negotiations. The more adversarial approaches, Arbitration and Litigation, are ranked last, and considered the most expensive and least efficient in the DRL. The changes in the American Arbitration Association' s (AAA) Construction Arbitration Rules to make the procedure more flexible and efficient, together with the emergence of binding techniques like Med-Arb and Shadow Mediation, support this movement away from binding adjudicative procedures.

Another important finding of this assessment relates to the role owners (i.e., agencies, private developers, and corporations) must play in the process of incorporating DART in the construction process. It was demonstrated that owners must expect disagreements during the construction process and should be prepared to manage and resolve them before they become disputes. Owners' participation in dispute prevention is critical. Also, their role acquires relevance in areas like risk assessment and allocation, preparation of documents, dispute resolution clauses, and cost and schedule control during all phases of construction. Contract specifications reviewed as part of this book provide examples as to this new role assigned to the owners (e.g., FIDIC, World Bank, CCDC, and Prevention Stage).

12.1 INTERNATIONAL DART USE AND APPLICATIONS

Regarding the international scenario, DART is receiving increasing attention worldwide. Examples presented in this book ranged from prevention techniques like risk sharing in a tunneling project in Canada to mediation and conciliation experiences in Hong Kong, to the introduction of the 'adjudicator' figure in the British legal system for construction disputes to expedite resolution of conflict. As an additional illustration of this exploding awareness, the AAA now has expanded beyond US borders to provide ADR services throughout the globe. As of May 1999, 53 arbitration and mediation agreements have been reached between the AAA and ADR institutions in other countries (see Appendix A). The organization now arranges training for arbitrators and mediators, and claims to have been instrumental in promoting the spread of ADR, helping other countries develop national arbitration acts and ADR organizations.

The international activities of the AAA, and the growth it has experienced in its foreign caseload support some interesting conclusions:

- Although Arbitration remains the primary dispute resolution technique utilized throughout the world, Alternative Dispute Resolution has achieved worldwide recognition and it is being used more and more by the business community to solve disputes without litigation.
- The inclusion of mediation together with arbitration as the primary ADR services offered by the AAA, confirms the shift towards non-binding procedures for dispute resolution worldwide.
- Agreements of cooperation and collaboration are creating an international standard for ADR, and at the same time a network of organizations that will allow a faster and a more effective resolution of disputes and dissemination of new ADR techniques as they are developed.
- Collaboration between these organizations should encourage international corporations to continue solving their disputes through the implementation of DART.

Also in the international arena, this book presents how cultural and market conditions can affect the type of dispute mechanism preferred by constructors and owners in different countries. The Netherlands' case (i.e., Frame Contract) shows how a pragmatic culture and an organized market discourage parties from engaging in adversarial relationships, letting them rely on trust to guarantee long-term commitments. Countries have favored certain types of ADR over others, as in the case of the Asian nations that have incorporated mediation and conciliation in their standard DRL before more adjudicative procedures. In Japan and Hong Kong, this book identified direct implementations of mediation in government agencies that can relate to the cultural background and traditions of 'harmony' and compromise. In the UK, more adversarial approaches such as adjudication have been incorporated into law and are expected to gain more adepts, while mediation has only recently become a recognized technique to resolve construction disputes.

Ultimately, many of the problems associated with construction disputes are not limited to particular geographic location or cultures. Disputes emerge whether the project is conducted in New Jersey, Calcutta, or the Caribbean, and the 'pandemic' nature of conflict in construction must be acknowledged, for one to properly manage it. Cultural differences will have a bearing as to the DRL to use, but the nature of the project and the participants will define the most appropriate system to use. For example, projects where parties come from different cultural backgrounds, including different languages, most address and foster from the beginning clear and continuous communication to reduce problems. Facilitated negotiations with third party neutrals that are familiar with these backgrounds will help overcome 'people issues' which can grow from this diversity.

12.2 AREAS OF FURTHER EXPLORATION IN DART

This section is directed to students and researchers as areas to pursue to gather more in depth information in the subject. The following areas of further research and exploration are recommended based on the findings of this work:

- Review how the changes in the Construction Arbitration Rules of the AAA have affected the procedures and what the response of the industry has been to these revisions.
- Incorporation of new communication technologies into conflict management and dispute resolution systems. New methods of dispute resolution are more and more based on methods of communication between parties and third-party intermediaries. With the advent of the Internet as a revolutionary communication channel, further research will need to shed light into the effects this new tool will have in the future deployment of ADR.
- In-depth review of international applications of DART in construction projects through the rules, conditions and experiences of ADR associations throughout the world, focusing on non-binding procedures like mediation and conciliation, to provide further understandings as to how culture and background can affect the implementation of these techniques.
- Throughout the review of the literature, the authors found a significant large quantity of applications of alternative dispute resolution in fields other than construction. A review of these applications in Health, Labor, Insurance, and Sports might provide insight as to other techniques that might be applicable to construction.
- Little information on partnering experiences was found beyond the US, Canada and the UK. More research could shed light as to the reasons behind this

apparent lack of interest towards this project philosophy in other parts of the world. New barriers on the implementation of partnering could be identified.

- How the increasing use of mediation as a DART will affect the flexibility and reduce the advantages it has over more binding approaches, such as: Arbitration. The increasing use of this technique might lead to a formalization that could hamper the advantages it currently holds.
- By defining the key characteristics and relationships in the most common delivery systems (e.g., Design-Bid-Build, Design-Build, and Build-Operate-Transfer) and the weaknesses of each one, specific dispute avoidance and resolution systems can be designed and proposed as basis for each type of project.
- Because third-party interventions appear to be among the key features of ADR in construction, training programs should be developed to guarantee a level of professionalism and to provide these agents with the necessary tools to address and help resolve construction conflicts.

As a final note, it is important to understand that the Construction Dispute Avoidance and Resolution Techniques as described in this book will likely change and evolve as new methodologies are designed and successfully implemented; as new research uncovers techniques already in use, but not reported, and as technology and innovation in communications open the door to more collaborative environments of operation. The fact that researchers are not able to replicate the construction process in order to study different techniques, similar to manufacturing, adds to the need for creativity and improvement of methods for each project. However, the following principles remain the same:

- Adversarial approaches can lead to excessive inefficient waste of resources and lost relationships.
- The industry has developed a significant quantity of techniques that are alternatives to litigation for the resolution of construction disputes.
- Prevention of disputes is far more efficient than trying to resolve them.
- The nature of construction conflicts and disputes requires flexibility.
- Third party intervention to promote communication and/or resolve technical issues address common sources of conflict in construction and therefore can be highly effective.
- Creativity should take precedence over a prescribed list of accepted procedures. Parties must learn about what techniques are available and choose and modify those that best fit their needs.

In conclusion, in the past decade, dispute resolution in the construction industry has evolved from private adjudication (i.e., arbitration) to voluntary techniques and approaches based on communication and collaboration, aimed primarily at avoiding open conflict and allowing the parties to develop a mutually agreeable settlement. This evolution is common to the construction industries of a number of countries. No longer is the only dispute resolution tool a lawyer. In fact, many DART still make use of this agent (i.e., Minitrial and Settlement Conferences), but in a non-adversarial environment that fosters the resolution of disputes faster, cheaper and without straining the relationships to the point where no further work together is possible.

12.3 REFERENCES

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