

การจัดการการเรียกร้องสิทธิในงานก่อสร้างโดยข้อมูลสารสนเทศสำหรับผู้ว่าจ้าง



นายกองกฤษณ์ โตะชัยวัฒน์

สถาบันวิทยบริการ

จุฬาลงกรณ์มหาวิทยาลัย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรดุษฎีบัณฑิต

สาขาวิชาวิศวกรรมโยธา ภาควิชาวิศวกรรมโยธา

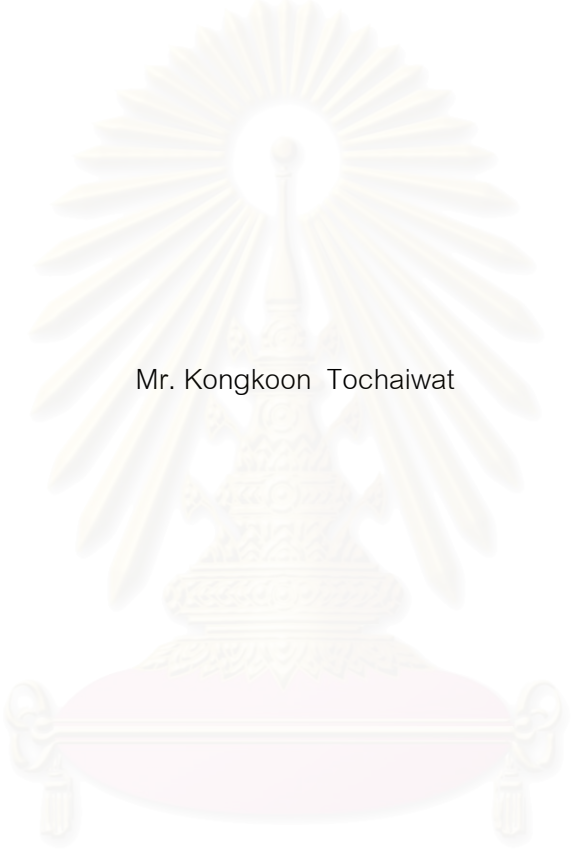
คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2548

ISBN 974-53-2547-3

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

INFORMATION-ORIENTED EMPLOYER'S CONSTRUCTION CLAIM MANAGEMENT



Mr. Kongkoon Tochaiwat

สภามหาวิทยาลัยวิศวกรรมศาสตร์
จุฬาลงกรณ์มหาวิทยาลัย

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program in Civil Engineering
Department of Civil Engineering

Faculty of Engineering
Chulalongkorn University

Academic year 2005

ISBN 974-53-2547-3

Copyright of Chulalongkorn University

กองกฤษณ์ โดชัยวัฒน์ : การจัดการการเรียกร้องสิทธิในงานก่อสร้างโดยข้อมูลสารสนเทศ
สำหรับผู้ว่าจ้าง. (INFORMATION-ORIENTED EMPLOYER'S CONSTRUCTION CLAIM
MANAGEMENT) อ. ที่ปรึกษา : รศ.ดร.วิสุทธิ ช่อวิเชียร, 363 หน้า.

ISBN 974-53-2547-3

วิทยานิพนธ์นี้มีวัตถุประสงค์เพื่อพัฒนาระบบการจัดการการเรียกร้องสิทธิในงานก่อสร้าง
สำหรับผู้ว่าจ้าง โครงการก่อสร้างขึ้นเพื่อเพิ่มประสิทธิภาพในการจัดการการเรียกร้องสิทธิในงาน
ก่อสร้าง โดยแนวทางดังกล่าวอาศัยการจัดการข้อมูลสารสนเทศที่จำเป็นในการจัดการการเรียกร้องสิทธิ
ในงานก่อสร้างของโครงการ ขั้นตอนการศึกษาประกอบด้วย วิเคราะห์ความต้องการข้อมูลในการ
เรียกร้องสิทธิ สำนวณลักษณะของการเรียกร้องสิทธิและระบบการจัดการการเรียกร้องสิทธิที่มีอยู่ใน
ปัจจุบันโดยการสำรวจด้วยแบบสอบถามและการสัมภาษณ์ วิเคราะห์ระดับความสำคัญของข้อมูลที่
ต้องการในการเรียกร้องสิทธิแต่ละข้อมูล วิเคราะห์ระบบเอกสารในการเรียกร้องสิทธิในงานก่อสร้าง
สำหรับผู้ว่าจ้าง โครงการที่ใช้อยู่ในปัจจุบัน ออกแบบระบบการจัดการการเรียกร้องสิทธิที่มี
ประสิทธิภาพสูงขึ้น ศึกษาแนวทางการนำไปใช้ในงานก่อสร้างจริง และตรวจสอบผลลัพธ์ที่ได้จาก
การศึกษา

ผลการศึกษาสรุปรว่ามีข้อมูลที่จำเป็นในการจัดการการเรียกร้องสิทธิในงานก่อสร้างของผู้ว่าจ้าง
ทั้งสิ้น 105 ข้อมูล ซึ่งสามารถแบ่งเป็น 4 กลุ่มตามระดับความสำคัญและระดับความยากง่ายในการ
รวบรวม นอกจากนี้ วิทยานิพนธ์นี้ยังเสนอระบบการจัดการการเรียกร้องสิทธิ ลักษณะ ปัญหา และ
ข้อเสนอแนะในการปรับปรุงระบบการจัดการการเรียกร้องสิทธิที่มีอยู่ ระบบการจัดการการเรียกร้อง
สิทธิในงานก่อสร้างที่พัฒนาขึ้นนี้ได้นำกระบวนการบริหารสัญญาของสัญญามาตรฐานสำหรับงาน
ก่อสร้างซึ่งจัดทำโดยสมาพันธ์วิศวกรที่ปรึกษานานาชาติ (Fédération Internationale des
Ingénieurs-Conseils, FIDIC) ข้อบังคับการอนุญาโตตุลาการของสภาหอการค้านานาชาติ
(International Chamber of Commerce, ICC) และการวิเคราะห์และออกแบบระบบข้อมูลสารสนเทศ
มาใช้ในการจัดการการเรียกร้องสิทธิของผู้ว่าจ้างตลอดกระบวนการ ผลจากการศึกษาแนวทางการ
นำไปใช้ในโครงการก่อสร้างจริงพบว่า ระบบดังกล่าวมีความเหมาะสมในการนำมาใช้และสามารถช่วย
ผู้ว่าจ้างในการรวบรวมข้อมูลที่ต้องการและครบถ้วนสำหรับจัดการการเรียกร้องสิทธิในงานก่อสร้าง

ภาควิชา วิศวกรรมโยธา

ลายมือชื่อนิสิต

สาขาวิชา วิศวกรรมโยธา

ลายมือชื่ออาจารย์ที่ปรึกษา

ปีการศึกษา 2548

4571829221 : MAJOR CIVIL ENGINEERING

KEY WORD: CLAIMS / CLAIM MANAGEMENT / INFORMATION / CONTRACT / FIDIC

KONGKOON TOCHAIWAT : INFORMATION-ORIENTED EMPLOYER'S CONSTRUCTION CLAIM MANAGEMENT. THESIS ADVISOR : ASSOC.PROF.VISUTH CHOVICHEN, PH.D., 363 pp. ISBN 974-53-2547-3

The objective of this thesis was to develop a claim management system for the employers of construction projects in order to enhance their efficiency in managing construction claims. The proposed system focuses on management of the information necessary for managing construction claims in projects. The study was carried out by performing a claim data requirement analysis, surveying characteristics of claims and existing claim management systems by questionnaires and interviews, finding the level of importance of each claim data, analyzing the existing claim documentation systems, designing the proposed claim management system, performing case study analysis, and verifying the thesis results.

It was found that there are 105 pieces of data necessary for managing employer's claims, which can be divided by their levels of importance and levels of availability into four groups. The proposed claim management system and the features, problems and recommendations for improving the existing employer's claim management systems were also reported. The proposed employer's claim management system was developed by adopting contractual procedures of Fédération Internationale des Ingénieurs-Conseils (FIDIC), dispute resolution procedures of the International Chamber of Commerce (ICC), and information system analysis and design techniques in managing the whole process of employer's claim management. The results from the case study show that the proposed model provides construction employers with complete and correct information for managing their construction claims.

Department.....Civil Engineering.....Student's signature.....
 Field of study.....Civil Engineering.....Advisor's signature.....
 Academic year.....2005.....

ACKNOWLEDGEMENT

I would like to extend my grateful and sincere thanks to Assoc. Prof. Dr. Visuth Chovichien for his invaluable suggestions and help in several things all the time I was a graduate student at Chulalongkorn University. Without his kindness, this thesis would not have come to a success.

In addition, I also would like to express my warm appreciation to Assoc. Prof. Dr. Tanit Tongthong for several generous suggestions and I wish to express my sincere thanks to Assoc. Prof. Dr. Wisanu Subsompon, Asst. Prof. Dr. Ping Kunawatsatit, Asst. Prof. Dr. Somboon Luvera, Asst. Prof. Dr. Veerasak Likhitrungsilp, Dr. Noppadon Jokkaw, Dr. Vachara Peansupap, Mr. Jumpot Kanjanapanyakom from Italian-Thai Development Public Company Limited, and Assoc. Prof. Supattra Boonmak from Faculty of Commerce and Accounting, Chulalongkorn University for their kindness and very useful advice.

There are a lot of persons from various organizations nationwide whom I would like to extend my special thanks for giving me all necessary data in several phases of this research including Mr. Kanit Poncheewin from Consulting & Management 49 Ltd., Mr. Pichit Poopichpong from Metropolitan Waterworks Authority, Mr. Prasan Ratanasali from Consultant of Technology Co., Ltd., Mr. Loylar Chitdecha from Ministry of Justice, Mr. Chaiyan Chitanon from Department of Water Resources, Mr. Pornthep Srivaranan from Department of Public Works and Town & Country Planning, Mr. Chalok Pamornprawat from Royal Irrigation Department, Mr. Phanu Parsakdee from Marine Department, Mr. Suthee Larpkiatthavorn from INTERPAC, Mr. Pratan Chongpakdee from Mass Rapid Transit Authority of Thailand (MRTA), Mr. Surajit Surapolchai from Airports of Thailand Public Company Limited (AOT), Mr. Jim Cochran and Mr. Dave Mccullagh from Project Management Consultant (PMC), and Mr. Boonrit Chitrabiab from Construction Supervision Consultant (CSC). Moreover, I would like to offer my thanks to all of my friends, university staff, and other persons whose names I would not be able to put here.

Finally, I would like to dedicate all the merits this thesis shall bring to my parents, who gave me everything until this thesis was complete.

TABLE OF CONTENTS

	Page
Abstract (Thai)	iv
Abstract	v
Acknowledgement	vi
Table of Contents	vii
List of Tables	ix
List of Figures	xi
Chapter I Introduction	1
1.1 Background	1
1.2 Objective	4
1.3 Scopes	5
1.4 Research Methodology	5
Chapter II Literature Review	8
2.1 Construction Claims	8
2.2 Construction Claim Management	11
2.3 Employer's Construction Claim Management Process	30
2.4 Information System	34
2.5 Summary	39
Chapter III Survey of the Construction Claim Management Systems	41
3.1 Data Requirement Analysis	41
3.2 Questionnaire Survey	57
3.3 Interview	78
3.4 Summary	90
Chapter IV Claim Data Importance Analysis	93
4.1 Description	93
4.2 Claim Data Importance Index	104
4.3 Summary	110
Chapter V Claim Document Importance Analysis	113
5.1 Description	113

TABLE OF CONTENTS (CONT.)

viii

	Page
5.2 Documents Necessary to Claim Management	115
5.3 Claim Document Importance Index	130
5.4 Summary	136
Chapter VI Problem-Cause-Solution Analysis	139
6.1 Description	139
6.2 Problems of Existing Claim Management Systems and Their Causes ...	136
6.3 Guidelines for Improving Efficiency of the Existing Claim Management Systems	151
6.4 Summary	158
Chapter VII Proposed Construction Claim Management System	160
7.1 Design Information	161
7.2 Proposed Claim Management System	170
7.3 Implementation of the Proposed System	183
7.4 Verification of the Research Results.....	184
7.5 Summary	189
Chapter VIII Application of the Proposed System: Suvarnabhumi Airport Case Study	193
8.1 Description	193
8.2 Suvarnabhumi Airport Project	197
8.3 Existing System at the Suvarnabhumi Airport Project	197
8.4 Guidelines to Implement the Proposed System	204
8.5 Summary	213
Chapter IX Summary, Conclusion and Recommendation	216
9.1 Summary and Conclusion	216
9.2 Recommendations for Further Research	226
References	227
Appendices	236
Appendix A: Examples of Questionnaires	237
Appendix B: List of Claim Related Documents	301
Curriculum Vitae	363

LIST OF TABLES

ix

Table	Page
2-1 Types of Claim Components for Various Types of Claims	18
2-2 Application of Information System in Construction Claim Management	35
3-1 Example of Analyzing the Data Necessary to Prove Claim Liability	43
3-2 Example of Analyzing the Data Necessary to Prove Delay	45
3-3 Contractor's Claim Cost Components and Their Methods of Calculation	46
3-4 Employer's Claim Cost Components and Their Methods of Calculation	52
3-5 Details of Questionnaires Sent	59
3-6 Numbers of Respondents in the Questionnaire Survey	60
3-7 Construction Budgets of Thai Public Authorities in the Year 2004	61
3-8 Frequency, Severity and Impacts of Employer's Claim-entitling Events	65
3-9 Frequency, Severity and Impacts of Contractor's Claim-entitling Events	67
3-10 Efficiencies of the Claim Management Processes	72
3-11 Problems and Recommendations Collected from the Questionnaire Survey ..	74
3-12 Types of Organizations of Interviewees	80
3-13 Types of the Construction Works Referred by the Interviewees	81
3-14 Interviewees Classified by Their Field of Expertise	81
3-15 Frequently-found Claims in Thai Construction Industry	87
3-16 Problems and Recommendations Collected from the Interview	88
4-1 Details of Matrices Created in the Data Importance Analysis	100
4-2 Data Required in Managing the Employers' Claims	104
5-1 Claim Data Missing from the Representative Project	120
5-2 Analysis of Recommended Additional Documents	124
5-3 Recommended Additional Documents	127
5-4 Ten Documents with the Highest Document Importance Indices	130
6-1 Problems and Recommendations Collected from the Surveys	140
7-1 Design Information of the General System	162
7-2 Design Information of the Claim Identification Sub-process	163
7-3 Design Information of the Claim Notification Sub-process	164

7-4 Design Information of the Claim Documentation Sub-process	165
7-5 Design Information of the Claim Analysis Sub-process	166
7-6 Design Information of the Claim Preparation Sub-process	168
7-7 Design Information of the Claim Negotiation Sub-process	169
7-8 Employer's Claim Events with Highest Impact Indices and Severity Indices	175
7-9 Contractor's Claim Events with Highest Impact Indices and Severity Indices ..	175
7-10 Claim Alarming Events with the Documents Used in Identifying	176
7-11 Numbers of Participants Classified by their Types of Organizations	186
7-12 Participants Classified by Their Field of Expertise	186
7-13 Correctness, Reliability, and Usefulness of the Research Outputs	188
8-1 Questions in Analyzing the System Implementation in the Case Study.....	193
8-2 Missing Claim Data in Suvarnabhumi Airport Construction Project.....	204
8-3 Advantages and Disadvantages of the Proposed AOT Organization Structure	209
B-1 High Importance Documents (with Claim Data)	302
B-2 Medium Importance Documents (with Claim Data)	336
B-3 Low Importance Documents (without Claim Data)	348

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

LIST OF FIGURES

xi

Figure	Page
2-1 Relationships between Conflicts, Claims and Disputes	9
2-2 Generic Methodology for Analyzing Delay Claims	26
2-3 Analysis of Weather-Related Claims	28
3-1 Interview Questions Used in System Analysis Phase	79
4-1 Data Importance Index Calculation Procedure	98
5-1 The Employer's Claim Procedure of The Construction Contract (1999)	116
5-2 The Contractor's Claim Procedure of The Construction Contract (1999)	117
5-3 Numbers of the Document Groups in the Representative Project	119
5-4 Complexity of the Data Flowing in the Existing System	122
5-5 Data Flowing in the Existing System (Simplified)	123
6-1 Causes of Problems in Thai Employers' Construction Claim Management	147
6-2 Guidelines for Improving Claim Management Efficiency	154
7-1 Basic Components of a System	160
7-2 Proposed Employer's Claim Management System	171
7-3 Framework of Proposed Construction Claim Management Information System	173
8-1 Parties in Suvarnabhumi Airport Construction Project.....	198
8-2 Internal Organization Structure of AOT.....	199
8-3 Problems in Construction Claim Management of Suvarnabhumi Project	200
8-4 Proposed Organization Structure for AOT	208
8-5 Framework of Proposed Claim Management Information System for AOT	210
9-1 Research Results	216

CHAPTER I

INTRODUCTION

1.1 Background

Construction claims are found in most of construction projects. A claim is the seeking of consideration or change by one of the parties involved in the construction process. (Arditi and Patel, 1989) The rising complexity of construction projects, the price structure of the industry, and the legal approach taken by owners and contractors has led to a substantially increased volume of claims. (Levin, 1998)

There is much research that shows the magnitude of the effects of construction claims on cost and time of projects. For example, a survey done by Semple (1994) in Western Canada found that a large proportion of claims involved some delay and in several cases the delay exceeded the original contract duration by over 100%. Regarding project cost, more than half of the claims resulted in additional cost of at least 30% of the original contract values. Other research carried out in the United States (Callahan, 1998) and in Thailand (Khanchitvorakul, 2000) revealed the same results: that is, the average cost escalation caused by claims is approximately 7% of the original contract value.

Although construction claims have a significant effect on projects, they are not adequately addressed. For example, Vidogah and Ndekugri (1997, 1998a) found several insufficiencies in existing claim management. Claim management was always performed in an ad hoc manner, not treated as a management function, and poorly resourced. The contractors' management information systems were ill designed to support claims. In addition, a study shows that records available on sites seldom allow an as-built schedule to be constructed easily (Scott and Assadi, 1999). The daily report is often given the least attention although it may be the most important document of the project (Pogorilich, 1992). A survey of construction claim management practices in Thai construction companies showed that the lack of awareness of claims of on-site people is considered the major problem of claim management. The inadequacies of supporting

evidence, stemming from unaware project personnel as well as improperly designed documentation systems, are also the most serious shortcomings causing loss of opportunity to recover incurred damages. The report recommended that the management level pay more attention to these aspects in order to have an effective claim management system (Surawongsin, 2002).

Since a success factor of a construction project is the resolution of contract disputes without litigation, an effective claim management system can help both employer and contractor in managing their claims. Some examples of the former claim supporting systems are Baram (1994), Khanchitvorakul (2000), Tantavech (2001), and Abdul-Malak et al. (2002).

Baram (1994) illustrated an integrated system developed to support a construction claim process and a litigation process by providing specialized technical supports for document control, productivity and schedule analysis, delay and impact cost calculations, and expert reports. This system consists of five major components of software: utilities, project management (including scheduling), database management, statistics, and graphics used to perform the integrated reporting.

The "CLAIM ASSISTANT PROGRAM", developed by Khanchitvorakul (2000), was designed to quantify construction claims based on actual costs incurred. There are five modules in this program: 1) the basic data module, 2) the claim module, 3) the payment module, 4) the claim report module, and 5) the forms module. This program can be used to establish a systematic approach for managing construction claims, minimizing human errors and omissions generated by humans, and helping construction companies easily search the information regarding construction claims.

The system developed by Tantavech (2001), called "CLAIM MANAGEMENT SYSTEM (CMS)", can guide and advise inexperienced project personnel to deal with construction claims in an administrative manner. This system was developed from MS ACCESS 2000 and Visual Basic 6.0. It allows users to input claim description and construction documentation, including daily reports, progress reports, cost reports, correspondence, minutes of meetings, requests for information and, change orders. It also provides critical information supporting claim preparation and administration, including guidelines for identifying causation, types of documents needed to support

each type of claim, a guiding procedure to deal with claim administration, a checklist for damages depending upon types of construction claims as well as critical information needed to be contained in claim proposals.

The "CLAIM MANAGER 2000" developed by Abdul-Malak et al. (2002) guides the user through the analysis of different claim types (e.g., differing site conditions, variation orders, defective specifications, and conflicting interpretations) and checks adherence to notice requirements. The model is characterized by a number of major stations of tracking and analysis including satisfaction of notice requirements, claim substantiation and adopted methods of analysis and documentation, and the integration of developed, structured approaches for achieving decisions along the said four technical grounds.

It can be seen that a majority of the available claim management systems have focused on supporting the contractor's claim process. Because of the differences between the employer's and the contractor's roles, rights, duties, availability of information, their relevant types and aspects of claims, and methods used to analyze and to price the claims, the claim management systems that are suitable for these two groups should also be different. While the contractor always claims against the employer for delays, changes in scope-of-work, accelerations, and differing site conditions, the types of claims generally filed by the employer against the contractor are for delayed project completion, defective work, and abandonment of the project (McDonald, 1984).

However, there still is a very little research published in this field. One of the employer's claim management systems was presented by Riad et al. (1994). They developed "MODA" ("Managing Owner-Directed Acceleration"), used for managing accelerations directed by the employer and for helping employers and contractors foresee the implication of accelerating a project in terms of cost and liabilities involved. This system can be used as a dispute-resolution tool for managing owner-directed acceleration. Furthermore, it can support mediator's job effectively and economically, and can considerably reduce the occurrence of acceleration-related disputes. The system is composed of an analysis module written in LISP as its backbone, and a knowledge-based module limited to aspects related to major contract forms. After

obtaining the input information from the user, the system triggers the analysis module. The analysis module generates several schedules to perform time-impact analysis. The system uses the knowledge base to assign liabilities to the parties for past events, including “Delayed, Accelerated, Added, and Canceled (DAAC)” activities that were not foreseen in the original schedule. These tasks are performed by using a set of if-then rules and certainty indices based on the responses obtained from the user. The system then incorporates this information chronologically into a compression analysis carried out again by the analysis module.

For the employer, it is a good idea to establish an effective claim management system so that he can be aware of the potential adverse effects and has opportunity to take proper action to protect the project or reduce losses in advance instead of simply complying with contractors’ claims. The employer’s claim management system should be able to substantiate the claim asserted by the contractor as well as notify the employer when certain types of claims occur in the project by using the data collected by his representative or submitted by the contractor. Moreover, this system should be able to help the employer prepare claim documents against the contractor and prevent claims filed against him.

At present, there is no research that studies the whole employer’s claim management process. The existing research, such as MODA, aimed to solve specific problems of certain claim types. Furthermore, there is no research work studying the data necessary to manage all general types of employer’s claims and the employer’s claim management process utilizing such claim data.

1.2 Objective

The objective of this research is to develop a claim management system for the employers of construction projects in order to enhance their efficiency in managing construction claims.

1.3 Scopes

This research was carried out with the following predetermined bases:

1. It mainly focuses on the employer because the proposed management system was developed to serve the employer in dealing with claims.
2. The contractual procedures specified in the *Conditions of Contract for Construction (1999)* and the *Client / Consultant Model Services Agreement (1998)* prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) are used as the basis for justifying the claim liabilities and damages.

1.4 Research Methodology

This research applied the “System Analysis and Design” concept (Dennis and Wixom, 2000) to find the problems and the solutions of the existing claim management system. The necessary data of the existing claim management systems were collected by several tools. Then the problems of the existing system were analyzed by various techniques which led to the designing of the problem solutions and the improvement recommendations. Finally, the research results were validated by expert opinions. The research methodology consisted of nine steps:

1. Claim Data Requirement Analysis

The objective of this phase was to analyze and list all data required by employers in managing their claims. The results from this analysis were used as one of the inputs in the questionnaire survey.

2. Questionnaire Survey

The main objective of this survey was to find the broad details of the claims and the existing claim management systems such as the frequency, severity, and impact of the events leading to the right to claim, efficiency of the existing claim management systems, availability of each claim data acquired in step 1, problems of the existing systems, and some recommendations for increasing the efficiency of the systems. The findings were inputted into the in the various following steps. Appendix A shows the examples of the questionnaires used in this research.

3. In-depth Interview

A group of qualified persons from several organizations, in both public and private sectors, were interviewed in order to collect the details and problems of the existing claim management processes. Interviewers' opinions about how to improve the claim management system in their organizations were also collected.

4. Claim Data Importance Analysis

This step analyzed the claim data acquired in the Claim Data Requirement Analysis to find their "Data Importance Indices" which help represent the level of their usefulness in claim management process. In analysis, the matrix method was adopted to handle a large number of data, claim components, and claim events.

5. Claim Document Importance Analysis

This analysis aimed at finding the availability of the claim data, the missing data, the level of importance of each document, and guidelines for improving the system by examining all documents flowing in the representative model. In finding the level of importance of a document, the Data Importance Indices derived from the Claim Data Importance Analysis were necessary.

6. Problem-Cause-Solution Analysis

The problems collected in the questionnaire survey and the interviews were analyzed by the Cause-Effect Diagram Technique for finding their significant causes. Then the causes of the problems were analyzed by a similar technique for finding the guidelines for improvement of the existing claim management systems.

7. System Design

All results acquired from the former steps, accompanied by knowledge gained from reviewing literature, were used for designing an effective claim management system. The proposed system was designed by considering the overall process as well as all six claim management sub-processes: claim identification, claim notification, claim documentation, claim analysis, claim preparation, and claim negotiation.

8. System Verification

After finishing the system design phase, the next phase was performed in order to ensure that the results of this research were correct, reliable, and useful. A seminar was held and representatives of various employer organizations, both public and

private, contractor companies, academic institutes, professional organizations, and other interested people participated in the seminar. All research results as well as some important background and research details were presented to the participants. Each participant was then asked to answer a questionnaire aimed at assessing the correctness, reliability, and usefulness of the research results. The questionnaires used in the seminar are shown in Appendix A.

9. Case Study Analysis

The final stage was aimed at finding the feasibility and the guidelines of a real-world construction project by use of a case study. In this research, the Suvarnabhumi Airport Project was selected. Results of case study were analyzed in various aspects: organization structure, information system, related laws and regulations, claim management techniques, etc., in order to find the proposed system's feasibility and implementation guidelines.

There are nine chapters in this dissertation. Chapter 2 [Literature Review] revealed the concerning work that supported the study. Chapter 3 [Survey of the Construction Claim Management Systems] aimed at collecting necessary data by various approaches: Data Requirement Analysis, questionnaire survey, and interviews. The importance of the claim data acquired was analyzed by Claim Data Importance Analysis described in Chapter 4 [Claim Data Importance Analysis] while the document flow system of an international project was analyzed in Chapter 5 [Claim Document Importance Analysis], which revealed the importance of each document in managing construction claims. Then, the problems and recommendations acquired from Chapter 3 were analyzed and their effects, causes, and solutions were shown in Chapter 6 [Problem-Cause-Solution Analysis]. From the results from the former chapters, the proposed claim management system was designed, verified and presented in Chapter 7 [Proposed Construction Claim Management System]. In Chapter 8 [Application of the Proposed System: Suvarnabhumi Airport Case Study], the feasibility of the proposed system implementation was studied by using the Suvarnabhumi Airport Project as the case study. Finally, all research results were summarized and concluded and some recommendations for the further studies were presented in Chapter 9 [Summary, Conclusion and Recommendation].

CHAPTER II

LITERATURE REVIEW

This chapter reviews the former work that are relevant to the research. They were placed into four sections: (1) Construction Claims, (2) Construction Claim Management, (3) Employer's Claim Management Process, and (4) Information System. In construction claim section, the basic concepts of construction claims such as their definitions and types, classified by various criteria, were presented. Knowing construction claims, it is necessary to know how to efficiently manage them. There are several sub-processes in construction claim management process. The employer's claim management process has some differences from the contractor's claim management process. Finally, the former studies about construction claim management systems were reviewed and summarized.

2.1 Construction Claims

A construction claim is defined as a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, extension of time or other relief with respect to the terms of the contract (Levin, 1998). Kumaraswamy (1997) described the relations among "conflict", "claim" and "dispute". In summary, disputes are taken to imply prolonged disagreement on unsettled claims and protracted, unresolved or destructive conflicts. This concept can be illustrated by Figure 2-1.

According to Bu-Bshait and Manzanera (1990), typical construction claims against employers are caused by several reasons such as poor project planning, scope changes, constructive variation orders, errors and omissions, contract accelerations and expediting. There are various methods of classifying construction claims into categories. These methods can be placed into three groups. The first group classifies claims into two basic types by the objectives of claims. They consist of:

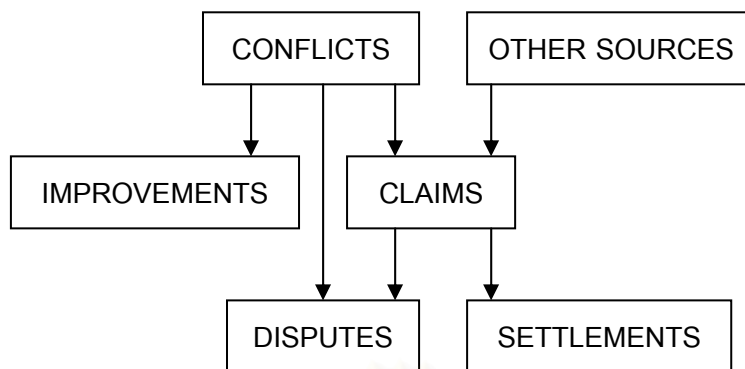


Figure 2-1 Relationships between Conflicts, Claims and Disputes

1. claim for extra time to complete the contract, and
2. claim for extra money arising out of the contract (Chappell, 1984).

The second group categorizes claims by considering their legal bases; Chappell (1984), Alkass and Harris (1991) and Hughes and Barber (1992) classified claims into three major types:

1. Contractual claims

Contractual claims are the claims that fall within the specific clauses of the contract, typically ground conditions, valuation, variations, late issue of information, and delay in inspecting finished work.

2. Ex-contractual claims

Ex-contractual claims (or extra-contractual claims) have no specific grounds within contract but are the results of breach of contract, which may be expressed or implied. An example of an ex-contractual claim is extra work incurred as a result of defective material supplied by the employer.

3. Ex-gratia claims

Ex-gratia claims are the claims in which there is no ground existing in the contract or the law, but the contractor believes that he has moral grounds: additional costs incurred as a result of rapidly increased prices.

Similar to the above works, Chappell et al (2005) classified claims into contractual claims, common law claims, quantum meruit claims and ex-gratia claims. Common law claims are claims for damages pursuant to breach of contract under

common law and/ or legally enforceable claims for breach of some other aspect of the law such as tort or breach of copyright or breach under statute. In addition, quantum meruit claims provide a remedy where no price has been agreed. The word “Quantum Meruit” is a legal Latin term, which may be translated as “what is deserved” or “what is worth”. An obligation to pay on a quantum meruit may be imposed by law (1) where work has been carried out under a contract, but no price has been agreed, (2) where work has been carried out under a contract believed to be valid, but actually void, (3) where there is an agreement to pay a reasonable sum, and (4) where work is carried out in response to a request by a party, but without a contract. In other words, this can be termed “a claim in quasi-contract” or “a claim in restitution” (Chappell, 2005).

The last group was proposed by Adrian (1988). He classified claims into four major types In order to facilitate the calculation of damages of claims:

a. Delay claims

This type of claim arises when a contractor is not able to perform his work during the time that he planned to do the work. The important causes of delay claims are increase in the cost, material shortages, new delivery and packaging systems, and new technology with regard to drawings and specifications. Delay claims are often characterized as the easiest to quantify and calculate.

b. Scope-of-Work claims

Scope-of-work claims are sometimes vague about the liability issue of the claim. As to the damages, this type of claim is less deterministic than delay claims. It is seldom independent of the other types of claims.

c. Acceleration claims

Acceleration claims, or productivity loss claims, usually occur as the result of a delay or scope-of-work claim when a contractor is required to perform his tasks in a time period less than initially planned or to utilize different or additional resources to speed up its production system. This type of claim has two common characteristics: large contract amount and difficulty to quantify. An acceleration claim may result from several causes.

d. Changing-site-condition claims

“Changing-site-condition” or “differing-site-condition” refers to physical conditions at the job site which differ materially from the conditions expressed in the construction contract or the conditions that normally could be expected in a job of that type (Jervis, 1988).

2.2 Construction Claim Management

The word “Management” means the process of dealing with or controlling people or things (Crowther, 1995). When combined with the meaning of the word “Claim” defined by Arditi and Patel (1989), the term “Construction Claim Management” can be construed as the process of dealing with or controlling the seeking of consideration or change by one of the parties involved in the construction process. Cox (1997) considered variation and claim management as part of both employers’ and contractors’ risk management which should begin even before the start of construction.

In order to deal with or control the claims effectively, parties concerned with them should establish good construction claim management processes in their organizations. Construction claim management process comprises six sub-processes:

1. Claim Identification
2. Claim Notification
3. Claim Documentation
4. Claim Analysis
5. Claim Preparation
6. Claim Negotiation

Some literature, such as that of Levin (1999), included the dispute resolution as a sub-process of claim management process. There are various options employers and contractors can select for settling the disputes occurring in projects such as litigation, arbitration, conciliation, quasi-conciliation, mediation, private inquiry, adjudication, and mini-trial. Each dispute resolution method has particular advantages and disadvantages. Sometimes, more than one method of dispute resolutions are implemented (Murdoch and Hughes, 1996).

2.2.1 Claim Identification

Construction claim recognition and identification involves “timely” and “accurate” detection of a construction claim. It is the first and critically important ingredient of the claim process (Kululanga et al., 2001). Callahan (1998) viewed the ability to recognize an emerging problem that could lead to a dispute, and allowing for this problem to be dealt with early as the most important part of dispute avoidance. He also presented the techniques used to anticipate or identify disputes at an early stage by all transit agencies in the United States and Canada, including the commuter rail agencies, which have undertaken construction in the last five years. They are (1) preconstruction meeting, (2) project meeting, (3) construction scheduling, (4) bid evaluation/ comparison, (5) project cost/ payment forecasting, (6) regular review of project documentation, and (7) proactive problem management at meetings.

In order to form a foundation for proper claim management and to keep the contractors out of trouble and free to concentrate on construction of the jobs, Adrian (1988) listed the general circumstances that typically cause claims and variation orders. They are:

1. vague terms in contract documents,
2. low bid of more than 10% lower than the next lowest bidder,
3. drawings prepared by distantly located designers who may not fully know local code requirements,
4. variation in the date stated in bid documents for works to start relative to date of notice to proceed,
5. employer-supplied material items,
6. situations requiring new technology or new construction methods,
7. excessive amount of uncertainty and unexpected weather conditions,
8. works requiring much interface among several contractors,
9. overly aggressive inspectors,
10. inspectors who like to “direct” versus inspect,
11. variation orders that do not have a well-defined scope of works,
12. post-pricing work,
13. jobs requiring excessive variation orders,

14. unreasonable number of written or oral inquiries made by the contractor regarding interpretation of drawings,
15. sudden drop in the contractor's staff at site,
16. oral protests made by the contractor,
17. adverse relationship between the designer and the contractor,
18. job site visit by an uninvited attorney.
19. the contractor's sudden taking detailed records or photographs of works,
20. threats of the contractor to stop working,
21. awareness of the contractor of the lost money on project,
22. continual changing of the contractor's supervisory personnel at job site,
23. unexpected soil conditions,
24. change of construction method by the contractor
25. change in construction standards during project.

2.2.2 Claim Notification

Construction claim notification involves alerting the other party of a potential problem in a manner that is non-adversarial. Time limit requirements are very crucial and critical. An initial letter of a claim notice should be concise, clear, simple, conciliatory, and cooperative. It should indicate the problem and alert the other party of the potential increase in time or cost (Kululanga et al., 2001).

Time limit requirements are normally specified in contracts. For example, the *Conditions of Contract for Construction (First Edition)*, prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) requires the contractor to notify the employer within 28 days after he became aware or should have become aware of the event or circumstance. However, in the case of claims filed by the employer, no time limit is specified (FIDIC, 1999).

2.2.3 Claim Documentation

Records and documentation play a very important role in the settlement of contract claims. Bu-Bshait and Manzanera (1990) listed nine records usually needed to substantiate a claim. With more focus on the delay claim, Elnagar and Yates (1997)

investigated the types of documentation used to determine the causes of project delays. The ten documents ranked as the top indicators of project delays were presented.

Jergeas and Hartman (1994) suggested that construction contractors should always file necessary records. Fifteen records were listed in the paper. Furthermore, Adrian (1988) explained how some technologies such as camera and recording devices can be alternatives for documenting important claim information.

However, there is a lot of evidence that the importance of record management is not realized as much as it should be. Scott and Assadi (1999) concluded that records available on sites seldom allow the as-built schedules to be constructed easily. Pogorilich (1992) reported that daily reports are often given the least amount of attention although they may be the most important document on the projects. Too often daily reports are prepared with minimal details and are subsequently ignored by management.

2.2.4 Claim Analysis

There are various literatures concerning the calculation procedures of the time and the cost impacts caused by the events leading to the rights to claim. These can be grouped into two major categories: time impact analysis (or schedule analysis) and cost impact analysis.

There are several schedule analysis techniques. The main differences of these techniques are their input schedules. Some techniques require as-planned schedules, while others require as-built schedules. Updated schedules are also the input for some schedule analysis techniques.

1. Global Impact Analysis (Alkass and Harris, 1991)

In using this technique, all delays are simply plotted on a summary bar chart. The total delay to the project is assumed to be the sum total of the durations of all individual delay durations.

2. Net Impact Analysis (Alkass and Harris, 1991)

Only the net effect of all delays including concurrent delays are plotted on a bar chart based on the as-built schedule. The claim analyst aims to obtain an extension of

time for the entire delay period from the original contract completion date to the actual completion of work.

3. Impacted As-planned Analysis or What-If Analysis (Levin, 1998; Al-Saggaf, 1998)

This method takes the original as-planned schedule as the baseline and inserts owner-caused changes/ delays in order to compute a resulting impacted as-planned schedule and a new contract completion date. The difference between the impacted completion date and the original as-planned completion date represents the total amount of excusable delay. Although this method is often used because of its simplicity, it has been consistently rejected by the courts and boards. The main disadvantages of this method are that (1) it takes into account neither contractor-caused delays nor other conditions affecting the work during project performance, (2) it is significantly affected by the inadequacy of the as-planned schedule because it is not economical to schedule the entire project in detail at the start, and (3) a project schedule is a dynamic and constantly evolving document, thus it is unreasonable to use a fixed as-planned schedule to evaluate project delays.

4. Collapsed As-built Analysis or But-For Analysis (Al-Saggaf, 1998; Levin, 1998)

But-For Analysis is based on the view that regardless of what happened on the critical path, there are other delays that would have delayed the project anyway. In this technique, an analyst prepares an as-built schedule based upon contemporary documents and then subtracts activities that he or she feels affected the project. The difference in days between the as-built and collapsed as-built end dates is considered to be the delay caused by the specific activity. The advantage of this technique is that it eliminates reliance on the as-planned schedule as a baseline while its problem is that it tries to prove a predetermined conclusion. An analyst first reaches a conclusion about what caused a delay and then uses the analysis to prove it. The path also changes depending on the subtraction made, and these changes do not agree with what was taking place on the project at the different time.

5. Contemporaneous Period Analysis Technique (CPA) or Time Impact Analysis (Alkass and Harris, 1991; Al-Saggaf, 1998; Levin, 1998)

“Contemporaneous Period Analysis” or “Time Impact Analysis” is a very effective method for complex construction projects. It mandates that the contractor properly update the CPM schedule. The first update is compared with the original schedule, and any delay that occurs during that period is analyzed using the But-For approach. The first update then becomes the new baseline, and the process is repeated until the project is completed. The total delay to the project duration is the summation of all delays during the project.

The absence of schedule updates does not prohibit the use of contemporaneous period analysis. The as-built schedule, in conjunction with a reasonable as-planned schedule, can be used to recreate schedule updates. This technique is a very effective method on complex construction project because it breaks the construction period into discrete time periods and examines delays as the project participants would have when they occur. This method protects everyone from delay claims because it forces all parties to reflect while the work is still in progress. In addition, Abdul-Malak, El-Saadi and Abou-Zeid (2002) commented that this method is superior to the What-If Technique and But-For Technique in that it relies on CPM updates to determine the true critical path at different points of time.

6. The Affected Baseline Schedule Technique (Al-Saggaf, 1998)

The baseline is affected by different delays, one after another. The initial schedule changes with the first delay, which extends the project's duration. The schedule is further extended by the next delay, which may extend the duration, and so on. The problem with this technique is that the critical path remains the same for the entire project and fails to incorporate the as-built information, so the affected schedule does not accurately reflect the reality of what actually happened.

7. Fragnet Analysis (Levin, 1998)

This method is one of the preferred methods to use during performance of the work. Fragnet or “Windows, chronological impact” analysis starts out using an updated schedule at the point the impact occurs as the baseline. A fragnet, or subnetwork, representing the changes or delaying activities, is then inserted into the CPM. After

adjusting the schedule of the balance of the project for any logic changes, an impacted schedule is generated with the new contract completion date. The difference between completion date of the impacted schedule and the completion date of the baseline schedule represents the net delay of the impact.

As to cost impact analysis, Adrian (1988) described the relationships between four types of claims (e.g., delay claim, scope-of-work claim, acceleration claim, and changing-site-condition claim) and each cost component (i.e., additional direct labor hours, equipment rental costs, and interest or finance costs). Table 2-1 summarizes the relationships.

Of the cost components always included in a claim, the following are difficult to calculate: additional direct labor hours due to lost productivity, cost for owned-equipment use, company overhead costs, and loss of opportunity profit.

1. Additional direct labor hours due to lost productivity

There are various ways to quantify the lost productivity:

- a. The Total Cost Method (Kallo, 1996; Finke, 1998 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

The contractor claims to recover the man-hour overrun by claiming the difference between the total incurred cost and the bid cost. This approach is easy to use but it should only be used if the situation is so complex that it defies analysis, the bid and actual costs are reasonable, and the contractor is not liable for the loss in work inefficiency. The inability to be used before project completion is also one of its constraints.

Adrian (1988) further classified the Total Cost Method into two different levels: Total Cost Method applied on a job basis and Total Cost Method applied on a work item basis. While the Total Cost Method applied on a job basis gives the lump-sum result, the Total Cost Method applied work item gives the contractor the potential to utilize an improved or more detailed method.

- b. The Modified Total Cost Method (Kallo, 1996 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

Table2-1 Types of Claim Components for Various Types of Claims (Adrian, 1988)

Type of Cost Claimed	Type of Claim			
	Delay Claim	Scope-of-work Claim	Acceleration Claim	Changing-site-condition Claim
Additional Direct Labor Hours	X	//	X	//
Additional Direct Labor Hours Due to Lost Productivity	//	/	//	/
Increased Labor Rate	//	/	//	/
Additional Material Quantity	X	//	/	/
Additional Material Unit Price	//	//	/	/
Additional Subcontractor Work	X	//	X	/
Additional Subcontractor Cost	//	/	/	//
Equipment Rental Cost	/	//	//	//
Cost for Owned-equipment Use	//	//	/	//
Cost for Increased Owned-equipment Rates	/	X	/	/
Job Overhead Costs(Variable)	/	//	/	//
Job Overhead Costs(Fixed)	//	X	X	/
Company Overhead Costs (variable)	/	/	/	/
Company Overhead Costs (Fixed)	//	/	X	/
Interest or Finance Costs	//	/	/	/
Profit	/	//	/	//
Loss of Opportunity Profit	/	/	/	/

// = Normally Included in Claim; / = Sometimes Included; X = Not Included

This method represent an improvement of the Total Cost Method by refining the original estimate of cost by removing errors in bid estimates, activities unaffected by employer-caused disruptions, excusable noncompensable delays, unaffected subcontractor work, and work done at a profit. Moreover, the contractor's bid estimate is validated by comparing it to the bid estimates of the other bidders. This is definitely an improvement over the previous method, but it still suffers the same two deficiencies: a lump-sum result and the need to wait for project's end to evaluate losses.

c. The Factor-Based Method (Kallo, 1996; Finke, 1998 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

This method applies "lost-efficiency factors" to the original estimate of man-hours required for the disrupted activities. The increase in man-hours is then claimed. These factors are based on changed work conditions, project characteristics, historical data, and expert opinion. There are various disadvantages to this method. The factors used are highly speculative and require substantive supporting documentation. Moreover, there is no activity-specific set of factors, but rather factors for projects as a whole. Even if such factors were developed, they would still need calibration to reflect peculiarities of projects and the contractor work forces. Therefore, factor-based method should be used for reference purposes only.

Adrian (1988) described the quantification of labor productivity as a function of environment such as temperature, humidity, wind and wind-chill, precipitation, and noise. He explained that several studies in this field have evolved from non-construction-industry studies such as those in manufacturing factories. However, he suggested that they can be inferred to the construction work, with some exceptions.

d. The Baseline Method (Barrie and Paulson, 1992 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

This method relies on the contractor's bid estimate. This method selects impacted activities with a major cost impact as claim items, rather than attempting to recover cost overruns for the project as a whole as in total cost

method. The Baseline Method still requires a lot of documentation to prove the reasonableness of the contractor's bid estimate.

e. The Modified Baseline Method (Barrie and Paulson, 1992 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

The Modified Baseline Method is also referred to as "Measure Mile Comparison" and "Comparison of Productivity Levels" and "Cause-And-Effect Method". It compares the productivity, expressed in time or cost per unit, during impacted periods to that in normal periods. Given that actual man-hour records are available, the modified baseline method is preferred over all the previous methods.

f. The Disruption Distribution Method (Finke, 1998 cited in Abdul-Malak, El-Saadi and Abou-Zeid, 2002)

In this method, the relationships between activities are modeled using quantitative and qualitative factors, which are derived from specific circumstances and project characteristics. The process begins by starting with the work activities directly affected and then distributing the disruption to the other activities similar to the Moment-Distribution Method used in structural analysis.

g. Measuring method using scientific measurement model (Adrian, 1988)

This method is perhaps the most credible method for quantifying an alleged lost productivity claim. However, its use is limited by the fact that claim recognition is more essential to the use of this method than any of the other methods. There are a number of models classified into this method such as:

- 1) Labor productivity rating model
- 2) Motion analysis model
- 3) Method Productivity Delay Model (MPDM)
- 4) Learning curve model
- 5) The production function

2. Cost for owned-equipment use

There are different ways a contractor establishes an owned-equipment estimate for a project. Adrian (1988) listed and described them from worst to best in regard to facilitating the claim process:

- a. Allocate a percentage of total firm-owned-equipment cost to a project
- b. Use rental rates that are published industry-wide to establish an owned-equipment cost estimate for a project.
- c. Establish an hourly cost for owned equipment and estimate it on a job basis.
- d. Establish an hourly cost for owned equipment and estimate it on a work item basis.

3. Head office overhead costs (or Company overhead cost)

There are various formula used to calculate the head office overhead cost.

These methods are as follows:

a. Eichleay Formula (Adrian, 1988)

This method was originally stated by the Federal Armed Services Board of Contract Appeals in the Appeal of Eichleay Corporation, 60-2 BCA Paragraph. 2668 (Jervis, 1988). It is the most common approach to the quantification of company overhead to be included in the claim. There are two different versions of the Eichleay formula commonly used in practice, one for delay claims and one for scope-of-work claims.

1) Eichleay Formula used in delay claim

Overhead Allocable to the Contract (2.1)

$$= \frac{\text{Contract Billings} \times \text{Total Company Overhead for Contract Period}}{\text{Total Billings for Contract Period}}$$

Daily Contract Overhead = Allocable Overhead (2.2)

Days of Performance

$$\begin{aligned} \text{Amount of Head Office Overhead} & \quad (2.3) \\ = & \quad \text{Daily Contract Overhead} \times \text{Number of Days Delay} \end{aligned}$$

2) Eichleay Formula used in scope-of-work claim

$$\begin{aligned} \text{Overhead Allocable to the Contract} & \quad (2.4) \\ = & \quad \frac{\text{Original Contract Direct Cost} \times \text{Total Overhead for Original Contract Period}}{\text{Total Direct Cost of Work for Contract Period}} \end{aligned}$$

$$\begin{aligned} \text{Head Office Overhead per Dollar of Direct Cost of Work} & \quad (2.5) \\ = & \quad \frac{\text{Allocable Overhead}}{\text{Original Contract Direct Cost}} \end{aligned}$$

$$\begin{aligned} \text{Amount of Head Office Overhead} & \quad (2.6) \\ = & \quad \text{Head Office Overhead per Dollar of Direct Cost} \times \text{Scope-of-work Amount} \end{aligned}$$

However, McDonald (1984) emphasized that the contractor cannot expect to recover unabsorbed company overhead simply by presenting such calculations. The contractor should be able to prove several points: (1) that head office activity actually increased as a result of project delays, (2) that he was unable to bid or bond new work because of the extended duration of the project, and (3) that he has no better means of calculating the increase in head office overhead than this formula.

b. Hudson Formula (Thomas, 1993)

This formula was put forward in *Hudson's Building and Engineering Contract*, tenth edition 1970. It uses the percentage in the contractor's tender for overheads (and profit) as a basis for the contractor's loss of contribution to overheads (profit) as a result of delay, shown by the following formula:

Amount of Head Office Overhead (2.7)

$$= \frac{\text{Head Office Overheads (Profit) \%}}{100} \times \frac{\text{Contract Sum}}{\text{Contract Period}} \times \text{Period of Delay}$$

c. Emden's Formula (Thomas, 1993)

This formula can be found in *Emden's Building Contracts and Practice*, eighth edition, Volume 2 by Bickford-Smith. The formula is identical to the Hudson Formula, save that the head office overhead percentages (and profit) used is the actual percentage based on the contractor's accounts and is arrived at as follows:

$$\text{Head Office (Profit) Percentage} = \frac{\text{Total Overhead Cost (Profit)}}{\text{Total Turnover}} \times 100 \quad (2.8)$$

d. Segmented Costs (Adrian, 1988)

This method can be performed by creating new accounting codes for specific types of costs, and implementing recording-keeping practices aimed at recording the individual costs to the job for which a claim has occurred. The intent of segmenting the company overhead costs to the claim job in question is to enable the capturing of actual company overhead costs needed to support the job rather than having to depend on an allocation process. Although the segmented costs method may be the best approach for quantifying and proving company overhead costs, there are two considerable constraints to this method. First, such an approach requires the contractor to recognize the existence of a claim immediately so that procedures can be initiated to segment the company overhead costs to the job. Second, it is very difficult to segment or trace some company overhead costs such as the monthly home office rental cost, to a specific job.

e. Original Estimate (Adrian, 1988)

This method relies on the use of the same percentage of company overhead used in the contractor's estimating task. Such an approach is

especially easy to use for a scope-of-work claim. However, the contractor may hesitate to use the original estimate approach because such an approach may result in smaller, sometimes much smaller, company overhead claim requests than would be determined using an allocation process such as Eichleay formula.

f. Industry Average (Adrian, 1988)

Industry average approach uses the average company overhead cost percentages for varying types of contractors and job sizes from various publishing companies, including Dun and Bradstreet and Robert Morris Associates (RMA). The contractor may select a published industry-wide average as the basis for quantifying his company overhead damage because he is reluctant to disclose the method used in his estimate or his estimation yields a company overhead claim significantly lower than that which would be calculated using the published industry averages. However, the employer's probable position against the use of the industry average approach is likely to focus on the fact that the contractor filing the claim cannot be considered to be representative of the average firm.

g. Contracted Percentage (Adrian, 1988)

Given the widely varying views on the quantification of company overhead for a claim, and given the project owner's frustration with deliberation of the matter and his potential to pay more than he believes is fair, several project owners have begun to set out a percentage for awarding the contractor for company overhead as part of the initial contract documents distributed to the contractor.

4. Loss of opportunity profit (Adrian, 1988 and McDonald, 1984)

Adrian (1988) described the method to calculate the contractor's loss of opportunity profit arising out of a delay caused by the employer or his personnel. To substantiate his loss of opportunity profit, the contractor must be able to show some evidence that he was given the opportunity to tender for other projects and that he could not reasonably have taken advantage of these opportunities because of the fact that his resources were retained on the delayed project. In formulating a claim for loss of profit, the contractor would be advised to keep a record of the following:

a. All tenders submitted and awarded so that a success ratio can be established.

b. All projects for which the contractor was invited to tender but which were declined or a deliberately high tender submitted. A bid ratio technique (a system of recording the net cost included in each tender as a percentage, or factor, of the successful tender) can be deployed to serve this purpose.

c. Other evidence, such as proximity of the submitted tender to the competitive range of other tenders, an analysis result of the construction activities during the period of delay, and limitations on the contractor's bonding facility space (if any).

On the other hand, McDonald (1984) described how the employer calculates the loss of profits and revenues in case it is the contractor who delayed the project. Details of the employer's loss of profits and revenues calculation will be reviewed in Section 2.3 [Employer's Construction Claim Management Process].

Furthermore, there are specific techniques used for analyzing specific types of claims such as the following techniques:

1. Delay claim analysis

Al-Saggaf (1998) proposed the five-stepped delay claim analysis procedure. His procedure comprised (1) gathering all relevant information, (2) investigating the location and timing of the delay, (3) identifying the causes of the delay and its effect on the completion of the project, (4) deciding about excusability and compensability of the claim based on the factor that caused the delay, and (5) identifying the responsible party. Kartam (1999) proposed the generic method for analyzing delay claims developed and successfully used by him. This method can be summarized by Figure 2-2.

2. Scope-of-work claim analysis

Veenendaal (1998) proposed the systematic procedure to analyze and present the impact of change orders on a schedule. This analysis can be done by the following steps:

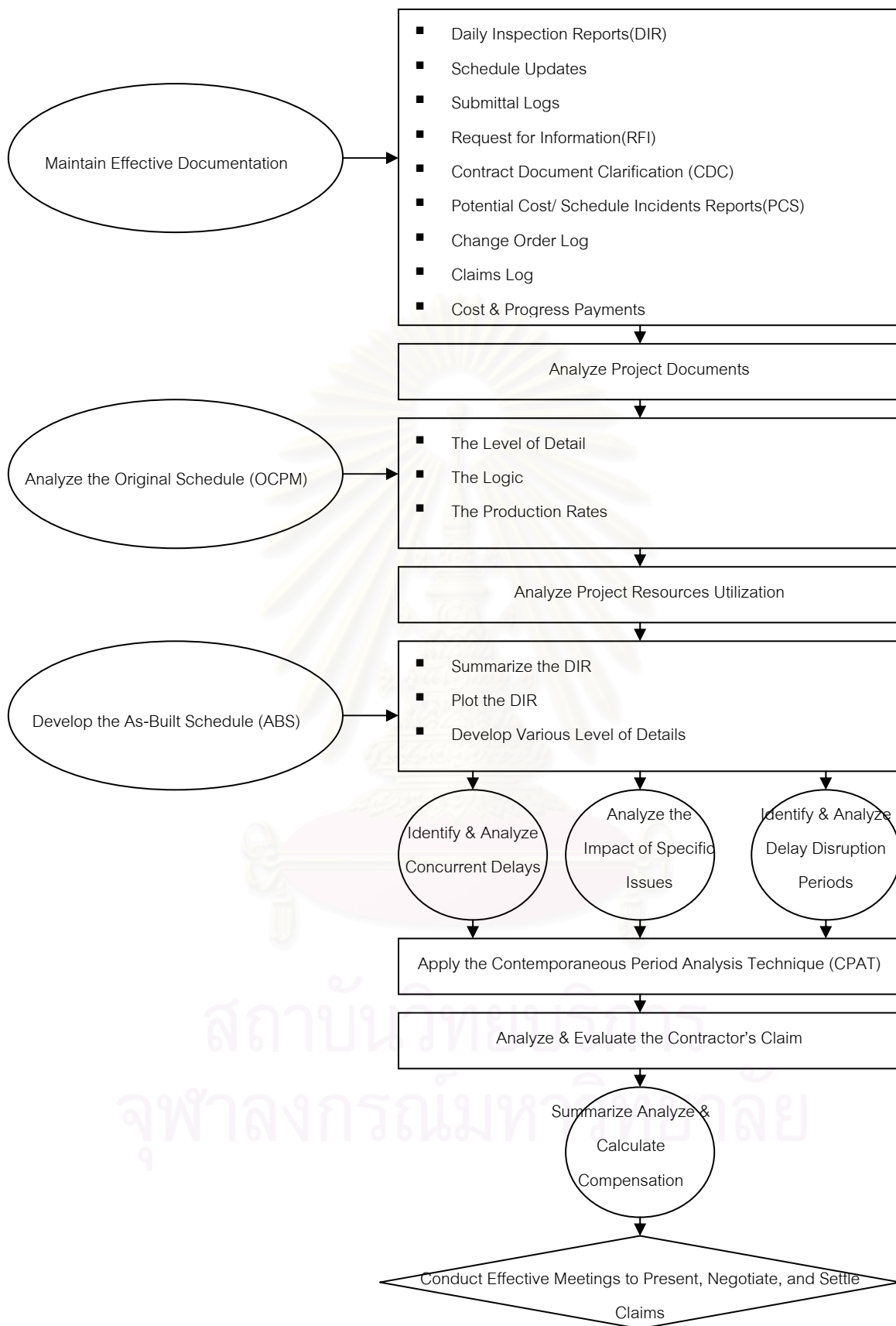


Figure 2-2 Generic Methodology for Analyzing Delay Claims (Kartam, 1999)

a. Prepare and issue a Request-For-Proposal

An alteration or variation to the scope of work is prepared and issued by the architect as a Request-For-Proposal submitted to the contractor. The contractor then reviews it for cost and schedule consequences.

b. Review the scope of the Request-For-Proposal

The contractor will review the Request-For-Proposal to determine the impact the change may have on the baseline schedule.

c. Incorporate the changes to the baseline schedule

Incorporate the changes to the baseline schedule, including all preparatory time, new work activities, and affected activities.

d. Set up a critical path comparison table

A comparison table is used to compare the outcomes of the change orders. It allows each activity along the critical path to be computed against each change order to determine the result on the schedule. This table should include columns for (1) the date the event occurs, (2) delays to the baseline early start date, (3) increase to the baseline duration, (4) an adjustment to the baseline slack time, and (5) the total variance to the baseline start date.

With each change order, a table is prepared that includes the baseline critical path activities and any new activities shifted to the critical path.

e. Perform impact analysis by analyzing where the impact occurs and what activities are affected.

By analyzing the updated schedule in conjunction with the comparison table, one can identify the effect the change order has on the baseline schedule.

f. Prepare a project change order summary

After analyzing the revised schedule and comparison table, the analyst can prepare a project change order summary that shows the required preparatory time, construction time, and the affected activities.

3. Weather-related claim analysis

Moselhi and El-Rayes (2002) presented an effective procedure for quantifying the impact of weather conditions on construction productivity, project schedule, and associated delays. They also developed a decision support

system, named WEATHER, designed to facilitate the analysis. Their proposed procedure is as shown in Figure 2-3

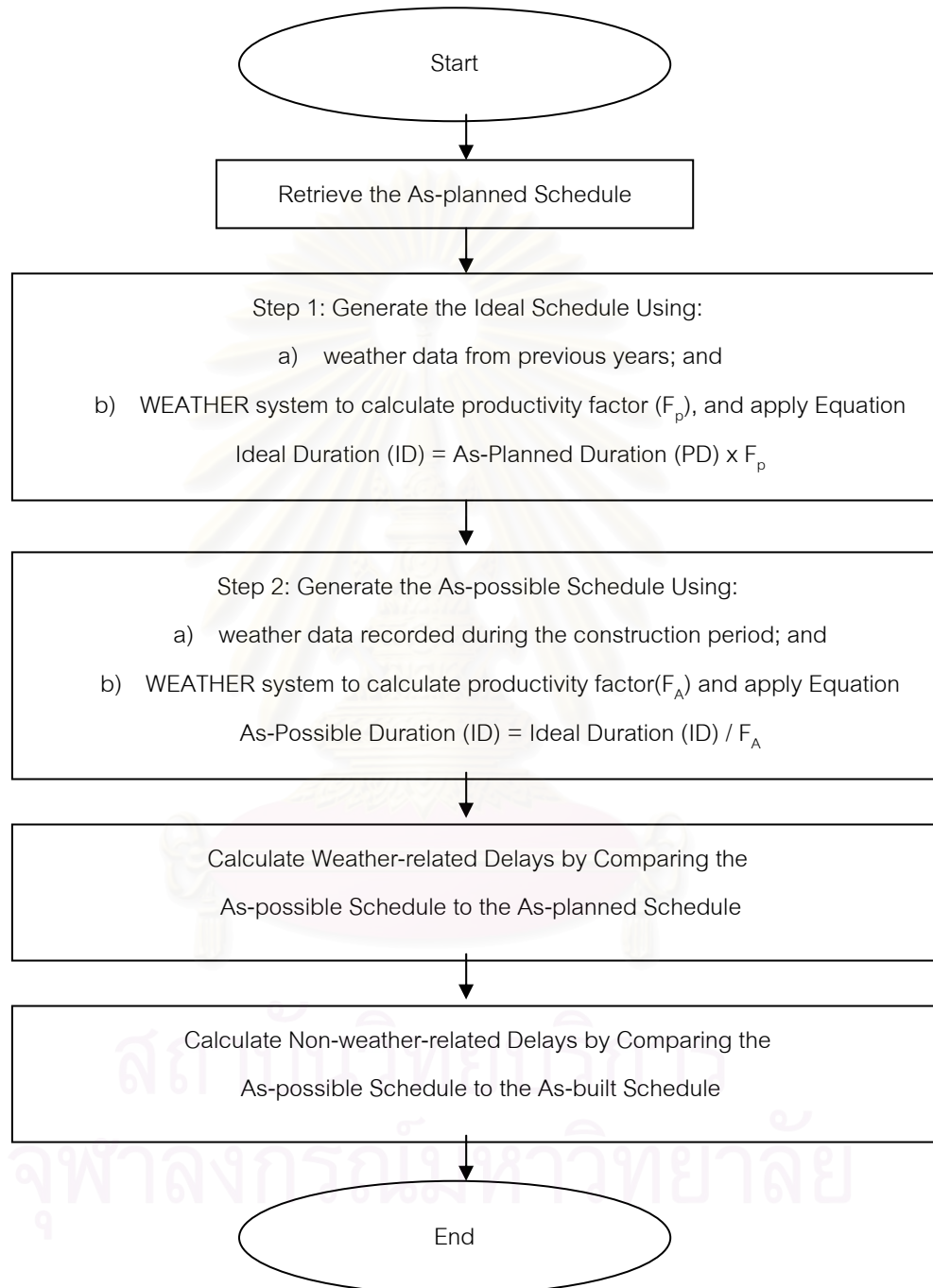


Figure 2-3 Analysis of Weather-related Claims (Moselhi, 2002)

After analysis of claim quantum, the amount of damages claimed to the other party will be determined. Pricing of claims can be divided into two types (Levin, 1998):

1. Forward Pricing

Under this scheme, the price is negotiated before the work is done. This type of pricing method is typically preferred since it encourages prompt revision of the progress schedule thus maintaining accurate record of the sequencing of the remaining work, the final contract price, and the final completion date.

2. Post-pricing

In post-pricing, the risks have been incurred and the added costs known. The difficulty is identifying and isolating all the changes and their attendant costs. The claimants are supposed to have good cost records, with adequate descriptions of the work performed. Thus, after a determination of the work which was affected by a change, the claimant will be able to identify and price all the costs associated with the changed work.

2.2.5 Claim Preparation

The purpose of this sub-process is to give the other party in the contract a substantive description and details of the extra costs incurred or to be incurred due to a contract change. This detailed cost description is necessary for understanding, negotiating, and justifying extra contract costs.

A claim presentation should be logically built up, well organized, and factually convincing. Thus, a claim should be written in a format that emphasizes the fact that a contract requirement was breached and demonstrates that the resulting damage was caused by the other party's acts. Claim proposals should be separated into two sections, the entitlement and the quantum. The former section should have legal and factual bases while the latter should provide the estimated recovery of the claim. (Kululanga, 1989)

Similar to claim notification sub-process, time limits for submitting claim proposals are normally specified in contracts. Sub-clause 20.1[Contractor's Claims] of the *Conditions of Contract for Construction (First Edition)* requires the contractor to submit final claim proposals within 28 days after the end of the effects resulting from the

event or circumstance that the contractor considered himself to be entitled to. In the case that such event or circumstance has a continuing effect, the contractor has to notify the engineer the accumulated delay or amount claimed and the further particulars. However, there is no time limit in case of the employer's claims (FIDIC, 1999).

2.2.6 Negotiation of Claim

Kululanga (1989) explained the reason for having negotiation and its advantages. A structured and proper negotiation preparation includes (1) ascertaining that all information is current and complete, (2) minimizing the scope of negotiation beforehand so that insignificant points should not precipitate a violent argument and disrupt progress, (3) knowing one's weakness and trying to utilize weak points by conceding them in return from the other party, (4) foreseeing problems, and (5) anticipating the opposition's next move.

If an agreement cannot be reached and any party believes his position is correct, he should propose an alternative dispute resolution method. If this fails, the choice remaining is to take the matter to court.

2.3 Employer's Construction Claim Management Process

There are very few papers concerned with employer's claims. Almost all focus on the contractor's claim management process. However, employer's claims should be studied in more detail because they are different from contractor's claims in important aspects, and knowledge of them can enable the employer to manage them efficiently. From a review pertinent literature, it can be determined that the employer's claim management process and the contractor's claim management process are different in the following aspects:

1. Types and aspects of claims

Because the employer has different roles from the contractor, his claim management process is also different. While the employer must be prepared for any contractor's claim against him, he may also make certain types of claims against the

contractor. These types of claims are the claim for delayed project completion, defective work, and abandonment of the project (McDonald, 1984)

2. Method to analyze and to price the claim

McDonald (1984) listed the cost components employers considered in calculating the damages against contractors. They are the following:

a. Liquidated damages

The concept of liquidated damages was proposed because it is difficult for the employer or a court to accurately compute the amount the owner has lost owing to late completion. These damages, stated as a per diem amount, establish the employer's damages for late completion. By this method, the employer need not prove the actual damages it incurred as a result of the contractor's late completion. All the employer needs to prove is the number of days of late completion attributable to the contractor. This number is then multiplied by the per diem rate to arrive at the liquidated damages to which the employer is entitled (Jervis, 1988).

b. Lost profits and revenues

In calculating such damages, the employer should be alert to losses suffered not only from late total access to the project, but also from the disruptive effect caused by partial access to a partially completed project. The employer must be careful not to use estimates in projecting profits; otherwise, he runs a significant risk of failing to recover anything because his damages are too speculative. McDonald also suggested that the best way to calculate such damage is through a comparison of the actual performance of a facility that is as close analogous as possible to the facility that is the subject of the claim.

c. Extended project overhead

The contractor is not the only party to a construction project who incurs extended overhead costs when the project is delayed. The employer may suffer damages of several types, which may be categorized as excess project overhead costs. Examples of these project overhead costs are the project inspector or clerk's salaries, extended rentals of owner-furnished equipment,

extended storage costs, increased payments for security or insurance, and the job office overhead cost.

d. Excess financing costs

Excess financing costs are often the most significant delay cost suffered by an employer. The employers frequently finance projects by taking out a construction loan that is converted to a permanent loan upon completion of the project. Typically, the interest rate on the construction loan is higher than the rate on the permanent loan. As a result of this arrangement, a delay in completion of the project can cause a delay in the initiation of permanent financing and an extended period of payment of the interest at the higher construction loan rate. In such case, the owner should claim as delay damages any actual interest payments that exceed the amount of interest that would have been paid but for the contractor's delay.

A related form of excess financing damages may be encountered by the employer if he is forced to borrow money under interest rates which have increased during the period of the contractor's delay. Furthermore, the employer should also claim the present value of the future excess interest if he is forced to accept a higher rate on his permanent financing as a result of the contractor's delay.

e. Loss of use of the facility

The employer may suffer more than lost profits and revenues as the result of his inability to use a facility as early as originally planned. The employer may be forced to rent another facility or to incur the costs of maintaining and operating another facility while waiting to move into the newly completed project. In any event, the employer should claim as delay damages against the contractor the net saving which would have accrued if he had been able to use the facility on the date it would have been available but for the contractor's delay.

f. Cost of defective work

If the employer is saddled with a project that includes defective work, he is entitled to recover from the contractor the costs of correcting the work. In

doing so, however, the employer must be careful to mitigate damages. This means that the employer cannot unnecessarily run up the amount of his damages by spending too much on corrective work. If he does, recovery of unnecessary correction costs will not be permitted. In fact, if the cost to correct the defective work is unreasonably high in light of the seriousness of the defect, the employer will not be allowed to recover any of the cost of corrective work because correction of the problem would constitute economic “waste”. In such case, the employer is only entitled to recover the decrease in the value of the property due to the defective work.

g. Costs of wrongful abandonment or rightful termination

If the employer has rightfully terminated the contractor, or if the contractor has wrongfully abandoned the project, the employer is entitled to recover from the contractor the difference between the cost of completing the work with a new contractor and the unpaid balance of the contract with the original contractor. Furthermore, the employer may claim for various delay costs in addition to direct costs of completing the work.

3. Procedures to claim against the other party.

The employer’s and the contractor’s contractual rights and responsibilities specified in the contract may be different. The *Conditions of Contract for Construction (First Edition)* specifies the employer’s claim process and the contractor’s claim process in sub-clause 2.5[Employer’s Claims] and 20.1[Contractor’s Claims] respectively.

In sub-clause 20.1[Contractor’s Claims], if the contractor wants to claim for any payment or any extension of time, he must give notice to the engineer not later than 28 days after he became aware, or should have become aware, of the claim event. The contractor must keep contemporary records under the engineer’s monitoring and send a fully detailed claim to the engineer within 42 days after the contractor became aware, or should have become aware, of the claim event. In case the claim event has a continuing effect, the contractor must send details of the delay, the claim amount, and further claim particulars as the engineer reasonably requires and send a final claim within 28 days after the end of such event.

As to the provisions related to the employer's claim, sub-clause 2.5[Employer's Claims] does not specify any time limit of notifying the contractor other than stating that if the employer wants to claim for extension of the "Defect Notification Period" (same as defect liability period), he must send the notice before the expiry of such period.(FIDIC,1999)

2.4 Information System

2.4.1 Principles of Information System

An information system (IS) is a set of interrelated components that collect, manipulate, and disseminate data and information and provide a feedback mechanism to meet an objective. An information system can be both manual and computerized. The computer-based information system (CBIS) consists of hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information. There are various types of information system such as electronic commerce systems (e-commerce system), transaction processing systems (TPS), management information systems (MIS), decision support systems (DSS), and special-purpose information system. One of these special-purpose information systems is based on the notion of artificial intelligence (AI) where the computer system takes on the characteristics of human intelligence. The field of artificial intelligence includes several sub-fields. These are expert systems (ES), artificial neural networks (ANN), learning systems, natural language processing, vision systems, and robotics (Stair and Reynolds, 2003).

From reviewing relevant literature, it was found that the information systems always applied to facilitate the claim management process are the decision support systems (DSS) and expert systems (ES).

Laudon and Laudon (2002) described decision support systems (DSS) as information systems designed to help the decision maker (i.e., the management of the organization) make decisions that are unique, rapidly changing, and not easily specified in advance. DSS address the problems that exist when the procedure for arriving at a solution may not be fully predefined. DSS, having more analytical power than other

systems, are built explicitly with a variety of models to analyze data or condense large amounts of data into a form that the decision makers can analyze. DSS are designed so that users can direct work with them, and they explicitly include user-friendly software. DSS are so interactive that the user can change assumptions, ask new questions, and include new data.

An expert system (ES) is a knowledge-intensive computer program that captures the expertise of a human in limited domains of knowledge. An ES can assist in decision making by asking relevant questions and explaining the reasons for adopting certain actions. ES lacks, however, the breadth of knowledge and the understanding of fundamental principles that of a human expert possesses. It is quite narrow, shallow, and brittle, typically performing very limited functions that can be performed by professionals in a few minutes or hours (Laudon and Laudon, 2002).

2.4.2 Application of Information System Concepts in Construction Claim Management

In the reviewed literature, the information system concepts were always applied to facilitate the claim management process in construction. The examples of these former applications are summarized in the following Table 2-2.

Table 2-2 Application of Information System in Construction Claim Management

No.	Year	Author(s)	Description
1.	1984	1. James E. Diekmann 2. Timothy A. Kruppenbacher	Developed "DIFFERING SITE CONDITIONS ANALYSIS SYSTEM (DSCAS)", the first construction contract legal analysis computer system, which is based on the techniques of Artificial Intelligence (AI).
2.	1988	1. Zuki M. Kraiem 2. James E. Diekmann	Developed "DISCON", an expert system designed to advice on the validity of differing site conditions claims, illustrates issues in legal reasoning and the corresponding knowledge representation.

Table 2-2 Application of Information System in Construction Claim Management (Cont.)

No.	Year	Author(s)	Description
3.	1989	1. David Arditi 2. Bhupendra K Patel	Explored the possibility of developing a knowledge-based expert system for claim management. Such system can prevent and resolve time-related construction disputes.
4.	1991	1. Sabah Alkass 2. Frank Harris	Developed "DELAY EXPERT", an integrated computerized system that aids in the analysis of claims resulting from delays.
5.	1992	1. James E. Diekmann 2. Moonja P. Kim	Developed "SUPERCHANGE", a part of an expert system designed to educate and advise inexperienced site engineers about legal consequences of construction disputes. This part of system can evaluate the validity of claims brought under the Changes clause found in Federal Acquisition Regulation(FAR) and can support decisions made by site engineers in several ways: (1) guiding the user through the analysis by controlling the direction of the analysis based on previous user responses, (2) providing a comprehensive, hypertext-based, context-sensitive help system, and (3) providing a report-writing capability that can be used by the site engineer's superiors to review judgments and conclusions.
6.	1992	1. James E. Diekmann 2. Knut Gjertsen	Developed "SITE EVENT ADVISOR (SEA)", a component of construction claim analysis expert system "CLAIMS GUIDANCE SYSTEM",

Table 2-2 Application of Information System in Construction Claim Management (Cont.)

No.	Year	Author(s)	Description
6.			<p>that can help determine which of several claim types could flow from some unusual event occurring at a construction site.</p> <p>This system can analyze the characteristics of the event & the nature of the potential dispute and suggests the kinds of claims (entitlement issues) that might likely arise from these circumstances.</p>
7.	1992	1. Geoffrey Bubbers 2. John Christian	<p>Discussed the problems of using rule-based expert system to analyze construction contract claims and proposed the hypertext information system to assist in analysis of a claim by informing contractors, employers, and their representatives of the contract provisions.</p>
8.	1994	George E. Baram	<p>Illustrated an integrated system developed to support construction claim process and litigation process by providing specialized technical support for document control, productivity and schedule analysis, delay, and impact cost calculations, expert reports, etc.</p>
9.	1994	1. Nagui I. Riad 2. David Arditi 3. Jamshid Mohammadi	<p>Developed "MODA", an integrated computerized system written in LISP, used for managing employer-directed acceleration and for helping employers and contractors foresee the implications of accelerating a project in terms of cost and liabilities involved.</p>

Table 2-2 Application of Information System in Construction Claim Management (Cont.)

No.	Year	Author(s)	Description
10.	2000	Sirithorn Khanchitvorakul	Developed "CLAIM ASSISTANT PROGRAM", a computer program, to provide assistance in construction claim. It can quantify construction claim based on the actual costs incurred.
11.	2001	Ronnapob Tantavech	Developed "CLAIM MANAGEMENT SYSTEM (CMS)", a prototype of information system, to guide and advise inexperienced project personnel to deal with construction claims in the administrative manner.
12.	2002	1. M. Asem U. Abdul-Malak 2. Mustafa M. H. El-Saadi 3. Marwan G. Abou-Zeid	Developed "CLAIMS MANAGER 2000", an automated system, which can guide the user through the analysis of the different claim types (differing site conditions, variation orders, defective specifications, and conflict interpretations), and check adherence to notice requirement.
13.	2002	Sy-Jye Guo	Developed a prototype decision support system that can identify and solve the workspace conflicts by integrating the computer aided design (CAD) software with scheduling software.
14.	2002	1. Osama Moselhi 2. Khaled El-Rayes	Established an effective procedure for quantifying the impact of weather conditions on construction productivity, project schedule and associated delay. This procedure uses a decision support system, named "WEATHER", designed to facilitate the analysis of weather-related construction claims.

The above information systems were developed both for specific types of claims and for various types of claims. ES and DSS have received frequent research attention. The majority of research addresses the contractor's claim process. As to the extent of the practical application, Vidogah and Ndedugri (1998b) revealed that claim management has benefited from information technology much less than the other management functions of construction organizations. The problems of applying information technology to claim management functions are most serious in the retrieval of supporting information and adequacy of information.

2.5 Summary

This chapter reviewed the relevant topics to the research, which were grouped into four main sections: construction claims, construction claim management, employer's claim management processes, and information systems.

A construction claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, extension of time or other relief with respect to the terms of the contract (Levin, 1998). There are several ways to classify construction claims.

There are several sub-processes related to construction claim management. Kululanga et al (1998) indicated six basic procedures for claims and variation order administration: (1) recognition and identification of claim, (2) notification of claim, (3) systematic and accurate documentation of claim, (4) analysis of time and cost impacts of claim, (5) preparing of claim, and (6) negotiation of claim while some literatures included the dispute resolution process as a sub-process of the claim management such as Levin (1998).

There are very few papers concerned with the employer's claims. Almost all focus on the contractor's claim management process. However, the employer's claim should be studied in more detail because they are different from the contractor's claims in important aspects and knowledge acquired can enable the employer to manage them efficiently. The employer's claim management process and the contractor's claim management process are different in the following aspects: (1) types and aspects of

claims, (2) methods to analyze and price claims, and (3) procedures to claim against the other party.

In the last section, the concepts of information systems and their application in the construction industry were reviewed. It was found that expert systems and decision support systems are the frequently addressed areas of research, but there are problems in the applicability of information technologies in construction.

From this review of literature, it was found that the claim management system is very useful for construction project employers in performing their claim management functions. However, the former research works normally focuses on the contractor's claim management system while works concerning the employer's claims aimed to solve problems of a specific claim type. There is no research work which addresses the data necessary to manage all common types of employer's claims and the employer's claim management processes of utilizing such claim data. The following chapters will show how the employer's claim management system was developed.



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER III

SURVEY OF THE CONSTRUCTION CLAIM MANAGEMENT SYSTEMS

In developing an information-oriented employer's claim management system, the data relevant to the events leading to claim as well as the existing claim management systems were very important. In this Chapter, necessary data of the existing construction claim management systems were collected by various approaches: (1) Claim Data Requirement Analysis, (2) questionnaire survey, and (3) interviews. The "Claim Data Requirement Analysis" aimed at analyzing and listing all data required by employers in managing construction claims. A questionnaire survey was used to collect required data from both employers (public and private) and contractors for understanding existing systems in several aspects: frequency and severity of the events entitling to the rights to claim, availability of data necessary for claim management, efficiency, problems of existing employer's and contractor's claim management systems, and recommendations to improve employer's and contractor's systems. Some data were used to perform analyses, which are discussed in the following chapters. In addition, a number of in-depth interviews were performed to find the details of existing claim management in Thai construction industry, its distinctive features, and its problems as well as recommendations for improving its efficiency. The data acquired in this chapter were the necessary inputs of the following analyses and design, as presented in the following chapters.

3.1 Claim Data Requirement Analysis

3.1.1 Descriptions

The objective of this phase of the research was to analyze and list all data required by employers in managing their construction claims. This phase can be further divided into four sub-steps:

1. Identifying and analyzing the claim components of both of the employers and the contractors. Some components have been proposed in other literature, especially

the cost components of the contractors' claims (Adrian, 1988). However, some components were not clearly specified in the literature such as the employer's claim components and some of the contractor's claim components specified in some contract provisions. Section 3.1.2 [Contractor's and Employer's Claim Components] shows the components of the contractor's and employer's claims as well as their sources.

2. Analyzing and finding the appropriate methods to substantiate or price each claim component identified in the previous sub-step. Some components have various approaches, which have different advantages and disadvantages. In Section 2.2.4 [Claim Analysis], the possible methods of calculating some claim components such as delay, additional direct labor hours due to loss of productivity, cost of own-equipment use, head office overhead cost, loss of opportunity profit were discussed. The most suitable method of each claim component was selected from the possible approaches by taking account of their correctness, popularities, uncomplicated natures, and consistency with the other methods.

3. Analyzing all data required in:

- a. analyzing each claim component using the selected method of calculation analyzed in the previous step, as shown in Table 3-3 and Table 3-4.
- b. calculating the number of days in claims for extension of times, as shown in the last item of Table 3-3 and Table 3-4.
- c. substantiating liability of each type of claim (e.g., contractual claims, ex-contractual claims, and ex-gratia claims).
- d. recognizing claim occurrences. For this purpose, the Claim Alarming Events suggested by Levin (1998), discussed in Section 2.2.1[Claim Identification], were analyzed to find the relevant data.

4. Analyzing the sources of each required data and identifying the availability to the employers and the engineers (as an employers' representative) of each data by considering its sources. The data which are not available to the employers or the engineers were then replaced with another alternative data that are directly or indirectly available to those parties. The purpose of this process was to ensure that all claim data are possibly available to the employers or the engineers.

For example, in calculating the liquidated damages employer's claim component, the analysis was comprised of three parts: (1) claim liability, (2) claim cost quantum, and (3) claim time quantum (used for calculating the cost of delay).

1. Claim Liability

From Sub-clause 8.7 [Delay Damages] of the *Conditions of Contract for Construction (First Edition)*, the employer has to prove three components in order to claim for liquidated damages against the contractor:

- a. The contractor failed to complete the whole of works, pass the Tests on Completion within the Time for Completion according to Sub-clause 8.2 [Time for Completion].
- b. There is a daily rate of liquidated damages specified in the contract.
- c. The employer or the engineer gave a notice of claim notification and particulars to the contractor as soon as practicable according to Sub-clause 2.5 [Employer's Claims].

The data required to prove each component are shown in Table 3-1. Note that the names in parentheses are the grouped names that the data are finally placed. The "Secondary Data" means the data can be derived by the other "Primary Data". The "Granted Time Extension" can be found from delay analysis, whose required data are analyzed in the following part.

Table 3-1 Example of Analyzing the Data Necessary to Prove Claim Liability

PROVING	DATA
1. The contractor failed to complete the whole of works, pass the Tests on Completion within the Time for Completion.	1. Commencement Date (Details of Contract Documents) 2. Time for Completion (Details of Contract Documents) 3. Date of Taking-Over of Works (Details of Documents Submitted) 4. Granted Time Extension (Secondary Data) 5. Reasons of Delays

Table 3-1 Example of Analyzing the Data Necessary to Prove Claim Liability (Cont.)

PROVING	DATA
2. There is a daily rate of Liquidated Damages specified in the contract	1. Details of Delay Damage Clause (Details of Contract Documents)
3. The employer or the engineer gave a notice of claim notification and particulars to the contractor as soon as practicable.	1. Intention to File Employer's Claim (Details of Documents Submitted) 2. Reason of Employer's Claim (Details of Documents Submitted) 3. Details of Employer's Claim (Details of Documents Submitted)

From Table 3-1, there are three pieces of data required in proving claim liability to liquidated damages: (1) Details of Contract Documents, (2) Details of Documents Submitted, and (3) Reasons of Delays.

2. Claim Time Quantum

In this research, Contemporaneous Period Analysis (Al-Saggaf, 1998) was selected for performing delay analysis because of its advantages of high effectiveness on complex construction projects, and forcing all participants to look back while the work is still progressing. This analysis was done by the following steps: (1) properly update the CPM schedule, (2) compare updated schedule with the prior-updated schedule, (3) analyze delays that occurred during period by using But-For approach, and (4) repetitively evaluate at the end of each update period until the project is completed. Table 3-2 shows the data necessary to perform each step of the calculation.

It was found that there are two pieces of data required in finding the number of delayed days: (1) Details of Documents Received, and (2) Reasons of Delays.

3. Claim Cost Quantum

Sub-clause 8.7 [Delay Damages] of the *Conditions of Contract for Construction (First Edition)* determined that the amount shall be calculated by using the daily rate stated in the Appendix to Tender and the total amount shall not exceed the maximum amount stated (if any). In addition, Sub-clause 10.2 [Taking Over of Parts of the Works] requires such daily rate to be proportionally reduced when some sections of the works

are taken over. From the said provisions, liquidated damages can be calculated by the following equation:

$$\text{Liquidated Damages} = \text{MAX} [\text{Liquidated Damage per Day in the Contract} \times \text{Delay Duration Attributable to the Contractor} \times (1 - \text{Price of Parts Taken Over} / \text{Contract Price}), \text{Maximum Liquidated Damages}] \quad (3.1)$$

Table 3-2 Example of Analyzing the Data Necessary to Prove Delay

STEP	DATA
1. Properly update the CPM schedule	1. Original Schedule (Details of Documents Received) 2. Actual Schedule (Details of Documents Received)
2. Compare updated schedule with the Prior-updated schedule	1. Updated Schedule (Secondary Data) 2. Former Updated Schedule (Secondary Data)
3. Analyze delays that were occurred during period by using But-For approach	1. Updated Schedule (Secondary Data) 2. Former Updated Schedule (Secondary Data) 3. Reasons of Delays
4. Repetitively evaluate at the end of each update period until the project is completed	1. Updated Schedule (Secondary Data) 2. Actual Schedule (Details of Documents Received)

From the equation, Primary Data used to calculate liquidated damages consist of: Liquidated Damage per Day in the Contract, Delay Duration Attributable to the Contractor, Price of Parts Taken Over, Contract Price, and Maximum Liquidated Damages. The “Delay Duration Attributable to the Contractor” is Secondary Data which

is the result of the delay analysis. Therefore, it can be changed to two pieces of Primary Data: Details of Documents Received, and Reasons of Delays. The Liquidated Damage per Day in the Contract, Price of Parts Taken Over, Contract Price, and Maximum Liquidated Damages are placed into the Details of Contract Documents grouped data. In conclusion, the data required in calculating claim quantum, in cost, are: (1) Details of Documents Received, (2) Reasons of Delays, and (3) Details of Contract Documents.

From data gathered from all parts, all claim data necessary to substantiate and calculate the liquidated damages are (1) Details of Contract Documents, (2) Details of Documents Submitted, (3) Details of Documents Received, and (4) Reasons of Delays. After performing the same procedure to all claim components, both of employers' and contractors', and all Claim Alarming Events, which can be analyzed in the same procedure of proving claim liability, 105 pieces of claim data were acquired.

3.1.2 Contractor's and Employer's Claim Components

There are 24 claim components related to the contractor's claims, which were the results of identifying and analyzing the contractor's claim components, the first step of the Claim Data Requirement Analysis. Their list and calculating methods are shown in Table 3-3. Some claim components were gathered from reviewing literature (e.g., extension of time and ordinary cost components) while some components were acquired by analyses of possible cost components and contract provisions.

Table 3-3 Contractor's Claim Components and Their Methods of Calculation

No.	Contractor's Claim Components	Method of Calculation
1.	Additional Direct Labor Hours	\sum (Actual Labor Hours Used in Additional Works x Actual Labor Rate)
2.	Additional Direct Labor Hours due to Lost Productivity	a) <i>If there are normal productivity data,</i> \sum [1/ (Normal Period Productivity – Loss Period Productivity)] x Actual Work Quantity x Actual Labor Rate

Table 3-3 Contractor's Claim Components and Their Methods of Calculation (Cont.)

No.	Contractor's Claim Components	Method of Calculation
2. (Cont.)		<i>b) If there is no normal productivity data,</i> $\sum (\text{Actual Labor Hour} \times \text{Actual Labor Rate}) - [(\text{Estimated Labor Hour} \times \text{Estimated Labor Rate}) \times (\text{Estimated Work Quantity} + \text{Variation Quantity}) / \text{Estimated Work Quantity}]$
3.	Increased Labor Rate	$\sum [(\text{Increased Labor Rate} - \text{Original Labor Rate}) \times \text{Labor Hours of Increased Labor Rate}]$
4.	Additional Material Quantity	$\sum [(\text{Actual Material of Original Works} - \text{Estimated Material} + \text{Actual Material Used in Variation Works}) \times \text{Material Unit Price}]$
5.	Additional Material Unit Price	$\sum [(\text{Increased Material Unit Price} - \text{Original Material Unit Price}) \times \text{Material of Increased Unit Price}]$
6.	Additional Subcontractor Work	$\sum (\text{Payment to Subcontractor for Additional Works})$
7.	Additional Subcontractor Cost	$\sum (\text{Actual Payment to Subcontractor} - \text{Estimated Payment to Subcontractor} - \text{Payment to Subcontractor for Additional Works})$
8.	Equipment Rental Cost	$\sum (\text{Actual Equipment Rental Cost} - \text{Estimated Equipment Rental Cost})$
9.	Cost for Owned-equipment Use	$\sum (\text{Equipment Unit Cost} \times \text{Actual Contractor's Equipment Hour});$ <p><i>When:</i></p> <p>Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost</p>

Table 3-3 Contractor's Claim Components and Their Methods of Calculation (Cont.)

No.	Contractor's Claim Components	Method of Calculation
10.	Cost for Increased Owned-equipment Rates	$\sum[(\text{Actual Equipment Unit Cost} - \text{Estimated Equipment Unit Cost}) \times \text{Actual Equipment Hour}];$ <p><i>When:</i></p> <p>Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost</p>
11.	Company Overhead Costs (Variable)	$\sum (\text{Contractor's Cost in the Segmented Cost Code} : \text{Company Overhead})$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>
12.	Company Overhead Costs (Fixed)	$\sum (\text{Contractor's Cost in the Segmented Cost Code} : \text{Company Overhead})$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>
13.	Job Overhead Costs (Variable)	$\sum (\text{Contractor's Cost in the Segmented Cost Code} : \text{Job Overhead})$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>
14.	Job Overhead Costs (Fixed)	$\sum (\text{Contractor's Cost in the Segmented Cost Code} : \text{Job Overhead})$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>
15.	Interest or Finance Costs	<p>New Financing Cost – Original Financing Cost;</p> <p><i>Cost of Capital :</i></p> $i = \text{WACC} = (E/V) \times RE + (D/V) \times RD \times (1 - T_c)$ $RE = D_1/P_0 + g$ <p><i>Note:</i> Dividend Growth Model Approach</p> $V = E + D$ $\text{Bond Value} = C \times [1 - 1/(1 + RD)^t] / RD + F / (1 + RD)^t$ <p><i>When:</i></p> <p>RE = Shareholders' require return on the stock</p>

Table 3-3 Contractor's Claim Components and their Methods of Calculation (Cont.)

No.	Contractor's Claim Components	Method of Calculation
15. (Cont.)		D_1 = Next Period's Projected Dividend P_0 = Price per Share of the Stock G = Growth Rate RD = Yield to Maturity of Bond V = Value E = Equity D = Debt T_c = Corporate Tax Rate <i>Note:</i> Assume constant growth rate (g) and not consider risk
16.	Profit	Percent of Profit from Original Estimate x \sum (Direct Cost of the Contractor's Claim + Indirect Cost of the Contractor's Claim)
17.	Loss of Opportunity Profit	\sum [Opportunity Profit Rate x Total Cost of Loss Opportunity Profit Project]; <i>When:</i> Opportunity Profit Rate is the maximum between: 1) Opportunity profit rate that make: $\text{Present Value of Cash Out} = \text{Present Value of Cash In} \times (1 + \text{Opportunity Profit Rate})$ or 2) Expected Interest Rate of Central Bank at Profit Loss Project Duration
18.	Unforeseeable Physical Conditions (according to sub-clause 4.12[Unforeseeable Physical Conditions])	$\text{MAX} [(\text{Cost Incurred by Unforeseeable Physical Conditions} - \text{Reduction in Cost for More Favorable Physical Conditions}), 0]$; <i>When:</i>

Table 3-3 Contractor's Claim Components and Their Methods of Calculation (Cont.)

No.	Contractor's Claim Components	Method of Calculation
18. (Cont.)		Cost Incurred by Unforeseeable Physical Conditions = \sum [Cost Incurred by Unforeseeable Physical Conditions]; Reduction in Cost with More Favorable Physical Conditions = \sum [Reduction in Cost with More Favorable Physical Conditions]
19.	50% of Benefits Gained from Value Engineering (according to sub-clause 13.2[Value Engineering])	$0.5 \times \sum$ [Reduction in Contract Value from Proposed Variation – Reduction in the Value to the Employer from Proposed Variation]
20.	Interest for Delayed Payment (according to sub-clause 14.8 Delayed Payment)	\sum [(Interest Rate for Delayed Payment / 365) x Payment Delay Duration x Amount of Payment Delayed]; <i>When</i> :Interest Rate for Delayed Payment = Interest Rate Specified in the Contract or = Interest Rate of Central Bank + 3
21.	Cost Indemnified (according to sub-clause 17.1[Indemnities])	\sum (Payment for Claim from Third Party)
22.	Insurance Premium (according to sub-clause 18.1[General Requirements for Insurances])	\sum (Payment for Insurance Premium)
23.	The Amounts Payable for Works Carried out	1) <i>Lump-sum contract</i> : \sum (Value in Schedule of Values x Percent of Completion)

Table 3-3 Contractor's Claim Components and Their Methods of Calculation (Cont.)

No.	Contractor's Claim Components	Method of Calculation
23. (Cont.)	(according to sub-clause 19.6[Optional Termination, Payment and Release])	2) <i>Unit cost contract:</i> $\sum(\text{Unit Cost of Works} \times \text{Actual Quantity of Works})$ <i>When:</i> Unit Cost of Works = Unit Cost in the Contract Documents or Adjusted Unit Cost 3) <i>Cost plus fee contract:</i> $\sum[\text{Actual Total Cost of Works} \times (1 + \text{Fee Percentage} / 100)]$
24.	Extension of Time (according to sub-clause 8.4[Extension of Time for Completion])	Contemporaneous Period Analysis

The components that were added to the common construction claim components in order to cover all compensation to the contractor specified by the provisions of the *Conditions of Contract for Construction (1999)* are (1) Unforeseeable Physical Conditions (according to sub-clause 4.12 [Unforeseeable Physical Conditions]), (2) 50% of Benefits Gained from Value Engineering (according to sub-clause 13.2 [Value Engineering]), (3) Interest for Delayed Payment (according to sub-clause 14.8 [Delayed Payment]), (4) Cost Indemnified (according to sub-clause 17.1 [Indemnities]), (5) Insurance Premium (according to sub-clause 18.1 [General Requirements for Insurances]), and (6) The Amounts Payable for Works Carried Out (according to sub-clause 19.6 [Optional Termination, Payment and Release]) (FIDIC, 1999).

It should be noted that some components can be calculated by several methods. The method shown is selected from all possible methods by taking account of their suitability.

On the other hand, there are 23 claim components related to the employer's claim. A list of them and their pricing methods are shown in Table 3-4. These claim components were acquired by analyses of (1) possible claim cost components, and (2) contract provisions specified in the *Conditions of Contract for Construction (First Edition)*.

Table 3-4 Employer's Claim Components and Their Methods of Calculation

No.	Employer's Claim Components	Method of Calculation
1.	Additional Direct Employer's Personnel Hours	\sum (Employer's Personnel Hours Used in Additional Works x Employer's Personnel Rate)
2.	Additional Direct Employer's Personnel Hours Due to Lost Productivity	<p>1) <i>If there are normal productivity data:</i></p> $\sum [1/ (\text{Normal Period Productivity} - \text{Loss Period Productivity})] \times \text{Actual Work Quantity} \times \text{Actual Labor Rate}$ <p>2) <i>If there is no normal productivity data:</i></p> $\sum (\text{Actual Labor Hour} \times \text{Actual Labor Rate}) - [(\text{Estimated Labor Hour} \times \text{Estimated Labor Rate}) \times (\text{Estimated Work Quantity} + \text{Variation Quantity}) / \text{Estimated Work Quantity}]$
3.	Increased Employer's Personnel Rate	\sum [(Increased Employer's Personnel Rate - Employer's Personnel Rate) x Employer's Personnel Hours of Increased Employer's Personnel Rate]
4.	Additional Employer's Free-Issue Material Quantity	\sum [(Actual Employer's Free-Issue Material for Original Works - Estimated Employer's Free-Issue Material + Employer's Free-Issue Material Used in Variation Works) x Employer's Free-Issue Material Unit Price]

Table 3-4 Employer's Claim Components and Their Methods of Calculation (Cont.)

No.	Employer's Claim Components	Method of Calculation
5.	Additional Employer's Free-Issue Material Unit Price	$\sum [(Increased\ Employer's\ Free-Issue\ Material\ Unit\ Price - Free-Issue\ Material\ Unit\ Price) \times Employer's\ Free-Issue\ Material\ of\ Increased\ Unit\ Price]$
6.	Additional Other Contractor Work	$\sum (Payment\ to\ Other\ Contractors\ for\ Additional\ Works)$
7.	Additional Other Contractor Cost	$\sum (Actual\ Payment\ to\ Other\ Contractors\ for\ Original\ Works - Estimated\ Payment\ to\ Other\ Contractors)$
8.	Cost for Employer's Owned-equipment Use	$\sum (Equipment\ Unit\ Cost \times Actual\ Contractor's\ Equipment\ Hour);$ <p><i>When</i> :Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost</p>
9.	Cost for Increased Employer's Owned-equipment Rates	$\sum [(Employer's\ Equipment\ Actual\ Unit\ Cost - Employer's\ Equipment\ Estimated\ Unit\ Cost) \times Employer's\ Equipment\ Actual\ Hour];$ <p><i>When</i> :Employer's Equipment Unit Cost = Employer's Equipment Hourly Ownership Cost + Employer's Equipment Hourly Operating Cost</p>
10.	Job Overhead Costs (Variable)	$\sum (Employer's\ Cost\ in\ the\ Segmented\ Cost\ Code : Job\ Overhead)$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>
11.	Job Overhead Costs (Fixed)	$\sum (Employer's\ Cost\ in\ the\ Segmented\ Cost\ Code : Job\ Overhead)$ <p><i>Note:</i> Use Eichleay's Formula to allocate</p>

Table 3-4 Employer's Claim Components and Their Methods of Calculation (Cont.)

No.	Employer's Claim Components	Method of Calculation
12.	Interest or Finance Costs	Original PV – Changed PV; <i>Cost of Capital (i) :</i> $i = WACC = (E/V) \times RE + (D/V) \times RD \times (1 - T_c)$ $RE = D_1/P_0 + g$ <i>Note:</i> Dividend Growth Model Approach RD = Yield to Maturity of Bond $\text{Bond Value} = C \times [1 - 1/(1 + RD)^t] / RD + F / (1 + RD)^t$ <i>Note:</i> (1) Constant growth rate (g) and not consider risk. (2) See notation in Table 3-3.
13.	Company Overhead Costs (Variable)	$\sum (\text{Employer's Cost in the Segmented Cost Code} : \text{Company Overhead})$ <i>Note:</i> Use Eichleay's Formula to allocate
14.	Company Overhead Costs (Fixed)	$\sum (\text{Employer's Cost in the Segmented Cost Code} : \text{Company Overhead})$ <i>Note:</i> Use Eichleay's Formula to allocate
15.	Loss of Use	$\sum (\text{Damages per Day} \times \text{Delay Duration} \text{ Attributable to the Contractor})$
16.	Liquidated Damages (according to sub-clause 8.7[Delay Damages])	$\text{MAX}[\text{Liquidated Damage per Day in the Contract} \times \text{Delay Duration Attributable to the Contractor} \times (1 - \text{Price of Parts Taken Over} / \text{Contract Price}), \text{Maximum Liquidated Damages}]$
17.	Reduced Value of Works (according to sub-clause 9.4[Failure to Pass Tests on Completion])	$\sum (\text{Value of Deficiency in Works})$

Table 3-4 Employer's Claim Components and Their Methods of Calculation (Cont.)

No.	Employer's Claim Components	Method of Calculation
18.	All Sums Paid for Works (according to sub-clause 11.4[Failure to Remedy Defects])	\sum (Payment to the Contractor for Works)
19.	Cost Indemnified (according to sub-clause 18.1[General Requirements for Insurance])	\sum (Payment for Claim from Third Party)
20.	Insurance Premium (according to sub-clause 18.1[General Requirements for Insurance])	\sum (Payment for Insurance Premium)
21.	Unavailable Insurance Cover (according to sub-clause 18.2[Insurance for Works and Contractor's Equipment])	\sum (Payment for Insurance Premium in the Former Year)
22.	Cost Incurred by the Contractor in the Expectation of Completing the Works (according to sub-clause 19.6[Optional Termination, Payment and Release])	\sum (Original Value of Works) – \sum (Value of Works Done by the Contractor)

Table 3-4 Employer's Claim Components and Their Methods of Calculation (Cont.)

No.	Employer's Claim Components	Method of Calculation
23.	Extension of Defects Notification Period (according to sub-clause 11.3[Extension of Defects Notification Period])	MIN [Duration between Date of Taking-Over of Works and Date that the Works can be Used as Intended, 730 days]

The *Conditions of Contract for Construction (First Edition)* allows the employer for the compensation of (1) Liquidated Damages (according to sub-clause 8.7 [Delayed Damages]), (2) Reduced Value of Works (according to sub-clause 9.4 [Failure to Pass Tests on Completion]), (3) All Sums Paid for Works (according to sub-clause 11.4 [Failure to Remedy Defects]), (4) Cost Indemnified (according to sub-clause 18.1 [General Requirements for Insurance]), (5) Insurance Premium (according to sub-clause 18.1 [General Requirements for Insurance]), (6) Unavailable Insurance Cover (according to sub-clause 18.2 [Insurance for Works and Contractor's Equipment]), and (7) Cost Incurred by the Contractor in the Expectation of Completing the Works (according to sub-clause 19.6 [Optional Termination, Payment and Release]) (FIDIC, 1999).

3.1.3 Data Necessary for Managing Claims

From collecting all data acquired in substantiation of claim components, claim liabilities, delays, and claim occurrences, 105 pieces of data were found necessary for the employers to manage their claims. Some are required in claiming against the contractors and the other parties while some are necessary for protecting the employers from being claimed. A list of the 105 data necessary for managing claims, accompanied by their "Importance Index" and "Availability Index" obtained from the following phases, which show how important each data is and how difficult the employer finds in collecting each data respectively, can be seen in Table 4-2 in Chapter 4 [Claim Data Importance Analysis].

The data acquired in the Claim Data Requirement Analysis were used in preparing questionnaires, performing Claim Document Importance Analysis, and designing the proposed claim management system in the following phases.

3.2 Questionnaire Survey

3.2.1 Description

The main objective of the survey was to find:

1. frequency and severity of each event justifying the rights to claim of both the employers and the contractors,
2. availability to the employers or the engineers (as the employers' representatives) of each piece of data from the Claim Data Requirement Analysis phase,
3. efficiency of the employers and contractors in managing the claims,
4. problems of the construction claim management and recommendations for improving the processes.

There were four sets of questionnaires: three sets of questionnaires comprising GX, GA, and GB for the employers and the other set, CX, for the contractors. Both GX and CX questionnaires had four parts of questions:

1. The first part contained the questions related to the respondents' data such as their positions, their working experiences, and their experienced maximum contract values. These data were used for identifying the respondents' qualification and screening unqualified respondents out. The contract value of 20 million baht, which was converted from the 500,000 dollar amount recommended by the Fédération Internationale des Ingénieurs-Conseils (FIDIC) for separating the small size projects from the medium and the big size projects (Booen, 1999), was used as a screening criterion. The respondents who have lower maximum experience contract values than the dividing point were screened out.

2. The second part contained thirty questions for the contractors or twenty questions for the employers, which are relevant to the frequency and severity of the events entitling them to the rights to claim. Each respondent was asked to approximate the number of occurrences per project for each event in each question. On the other

hand, the severity of each event was assessed by using five-leveled Likert-Scaled questions.

3. The third part contained nine five-leveled Likert-Scaled questions related to the contractors' or the employers' abilities to manage their claims, acquired by deliberately grouping each party's tasks for each sub-process considering their amounts and their similarities: (1) recognition and identification of the change, (2) notification of the change, (3) performing systematic and accurate documentation of the change, (4) performing analysis of time and cost and then pricing the change, (5) negotiation about the claim, (6) recognition and identification of the other party's change, (7) performing systematic and accurate documentation of the other party's change, (8) performing analysis of time and cost and pricing the other party's change, and (9) negotiation about the other party's claim.

4. The fourth part was an open-ended question asking the respondents to identify the problems or the recommendations related to their construction claim management processes.

As to the remaining sets of questionnaires, GA and GB, both of them were used for collecting the availability of 105 claim data. GA contained the data related to project employer, contractor, and construction project while GB contained the data related to construction project, engineer, payment or contract price, relationships between parties, and miscellaneous data. There were three parts in GA and GB questionnaires:

1. The first part contained the questions related to the respondents' data, similar to those of GX and CX sets of questionnaires.

2. The second part contained questions that were relevant to the availability of each claim data. Each respondent was asked to assess his ability to acquire each data by using five-leveled Likert-Scaled questions (McIver and Carmines, 1981).

3. The last part was an open-ended question for collecting problems or recommendations, similar to those of the GX and CX questionnaires.

Table 3-5 Details of Questionnaires Sent

Set Code	Type of Respondents	Topic of Question	Form of Questions	Number of Questions
1. GX	Employer or Engineer	a. Respondents' details	Fill in the blank	5
		b. Frequency of claims	Fill in the blank	20
		c. Severity of claims	Likert Scale	20
		d. Efficiency of claim management	Likert Scale	16
		e. Problems and recommendations	Open-ended	1
2. GA	Employer or Engineer	a. Respondents' details	Fill in the blank	5
		b. Availability of data (first half)	Likert Scale	51
		c. Problems and recommendations	Open-ended	1
3. GB	Employer or Engineer	a. Respondents' details	Fill in the blank	5
		b. Availability of data (second half)	Likert Scale	54
		c. Problems and recommendations	Open-ended	1
4. CX	Contractor	a. Respondents' details	Fill in the blank	5
		b. Frequency of claims	Fill in the blank	33
		c. Severity of claims	Likert Scale	33
		d. Efficiency of claim management	Likert Scale	16
		e. Problems and recommendations	Open-ended	1

Table 3-5 shows the contents of all sets of questionnaires used in the research. The questionnaires were mailed to the management of 200 public organizations and private consulting companies and 300 contractor companies. They were selected by using the Stratified Sampling Technique, taking account of their locations (Bangkok,

Bangkok Vicinity, Central Part, Northern Part, North Eastern Part, and Southern Part) for the contractors, and their type of organizations (private, or public) for the employers. The criterion used in classifying the contractors' locations was adopted from that of the National Statistical Office, which groups the Eastern Part and the Western Part of Thailand with the Central Part (National Statistical Office, 2004). The number of questionnaires sent and returned for each set of questionnaires is shown in Table 3-6.

Table 3-6 Numbers of Respondents in the Questionnaire Survey

No.	Description	Sent		Returned	
		No.	%	No.	%
1.	Employer				
	a. GX				
	1) Private	64	32.00	11	28.95
	2) Public	136	68.00	27	71.05
	Total	200	100.00	38	100.00
	b. GA				
	1) Private	64	32.00	13	39.39
	2) Public	136	68.00	20	60.61
	Total	200	100.00	33	100.00
	c. GB				
	1) Private	64	32.00	12	29.27
	2) Public	136	68.00	29	70.73
	Total	200	100.00	41	100.00
	d. All				
	1) Private	192	32.00	36	32.14
	2) Public	408	68.00	76	67.86
	Total	600	100.00	112	100.00

Table 3-6 Numbers of Respondents in the Questionnaire Survey (Cont.)

No.	Description	Sent		Returned	
		No.	%	No.	%
2.	Contractor				
	a. Bangkok	84	28.00	15	45.46
	b. Vicinity	30	10.00	2	6.06
	c. Central	45	15.00	5	15.15
	d. Northern	48	16.00	4	12.12
	e. North Eastern	61	20.33	7	21.21
	f. Southern	32	10.67	0	0.00
	Total	300	100	32	100.00

The ratios of the numbers of questionnaires sent to all groups of employers and contractors were equal to those of Thai construction industry. In the year 2000, the Gross Domestic Product (GDP) originating from Thai construction industry was equal to 150,069 million baht, of which the public sector had contribution of 101,636 million baht (National Economic & Social Development Board, 2004). For this reason, the ratio of 68: 32 (or 17: 8) was used to determine the numbers of questionnaires sent to public authorities and private consultant companies respectively. The numbers of the questionnaires sent to the management of public authorities were calculated from the percentage of their construction budgets to the construction budget of all public authorities in the year 2004, as shown in Table 3-7 (TCA, 2004).

Table 3-7 Construction Budgets of Thai Public Authorities in the Year 2004 (TCA, 2004)

No.	Ministry	Budget (Baht)	Percentage	Number of Questionnaires
1.	Ministry of Transport	43,047,614,900	42.61	59
2.	Ministry of Agriculture and Cooperatives	23,565,850,000	23.33	32
3.	Ministry of Interior	11,921,698,000	11.80	16

Table 3-7 Construction Budgets of Thai Public Authorities in the Year 2004 (Cont.)

No.	Ministry	Budget (Baht)	Percentage	Number of Questionnaires
4.	State Enterprises	6,550,000,600	6.48	11
5.	Ministry of Natural Resources	5,403,972,000	5.35	5
6.	Government Authorities Not	2,412,551,300	2.39	3
7.	University Department	2,239,857,700	2.22	3
8.	Pattaya	1,150,703,000	1.14	2
9.	Ministry of Justice	1,105,962,300	1.09	1
10.	Independent Organizations	902,137,100	0.89	1
11.	Ministry of Public Health	866,583,300	0.86	1
12.	Ministry of Energy	690,784,300	0.68	1
13.	Ministry of Science and Technology	478,588,000	0.48	1
14.	Others	687,614,747	0.68	0
	Total	101,023,917,247	100	136

Each management group of each public authority or consulting company received three questionnaires, GX, GA, and GB, while the contractor received only one questionnaire, CX. Reading the instructions on the cover page, management was informed of the important data such as the research objective, the name of the responsible person, the qualification of the required respondents, and the method to contact the researcher, and was asked to assign one or more qualified persons to reply the questionnaires. An envelope, with the address of the researcher, was attached with each questionnaire.

The data acquired from the returned questionnaires were then analyzed. The data acquired from the employers' organizations were analyzed both by considering them as a whole and as the separated private employers and public employers. However, the contractors' data were analyzed only by considering them entirely because there is no significant influence from the location to the characteristics of the

contractors. In fact, the majority of the contractors have projects nationwide or in more than one region of the country.

3.2.2 Claim Events and Their Frequency, Severity, and Impacts

For finding of the importance of an event causing the right to claim, the frequency of occurrences, severity or the level of damages per occurrence, and impact or total effects of the events causing the right to claim on a construction project, should be stated. The Frequency Index, Severity Index and Impact Index of a claim event will be used to present the frequency, severity, and impact of a claim event and how much attention should be given from the employer, as well as the contractor, in managing their claims. The higher index, the higher level of frequency or severity or impact (as the case may be) the claim event has.

Table 3-8 and Table 3-9 show the frequency and severity of each event entitling the employer and the contractor to the right to claim, respectively. The calculation methods were as follows:

1) The average frequency of events leading to the rights to claim occurring in one project can be calculated from summation of all average numbers of occurrences per project of all events in the questionnaires.

2) The average frequency in (1) was converted into 10-scored basis by dividing by the maximum value of the frequency score of the employer's claim events or the contractor's claim events (as the case may be) and then multiplied by ten, as shown in Equation 3.2. Note that the events with the highest frequency for the employer's claims and the contractor's claims were the events related to the claims for retesting (5.38 times per project) and the claims for variation orders (8.48 times per project) respectively.

$$\text{Claim Event Frequency Index}_i = 10 \left(\frac{\text{Frequency}_i}{\text{Max Frequency}_{\text{contractor / employer}}} \right) \quad (3.2)$$

3) The severity level score of each claim event was calculated from finding the average of all respondents' answers to the considering event.

4) The Claim Event Severity Index for each claim event was calculated by changing the denominators of severity level score from 4 to 10 by multiplying by 10/4 in order to change the Claim Event Severity Index from the 4-scaled basis used in the questionnaires to the 10-scaled basis that is more suitable for calculation and interpretation, as shown in the following formula:

$$\text{Claim Event Severity Index}_i = \frac{10}{4}(\text{Severity Score}_i) \quad (3.3)$$

5) The Impact Index of each type of claim is equal to one-tenth (0.1) of the product between Claim Event Frequency Index (from Equation 3.2) and the Claim Event Severity Index (from Equation 3.3). The reason of multiplying by one-tenth is to convert from 100-scaled basis to 10-scaled basis, similar to the other indices. Since both frequency and severity of the claims have a high impact on the project, the Claim Event Impact Index, which take account of both of them, should be used in determining the impacts of the claims on a construction project. The following equation shows how to calculate Claim Event Impact Index.

$$\text{CLAIM EVENT IMPACT INDEX} = \frac{1}{10} \times (\text{FREQUENCY INDEX}) \times (\text{SEVERITY INDEX}) \quad (3.4)$$

Table 3-8 and Table 3-9 show that the contractors in the construction projects have to cope with the events entitling them to claim more often and with higher average severity than the employers, as seen from the higher frequency and Claim Event Severity Index of the contractor's overall claims. The contractor's claim event frequency was 94.19 while the employer's one was only 37.59. This implied that the contractors' chances to file claims against their employers are approximately three times as the employers' ones. As to the Event Severity Index, the average Claim Event Severity Index of the contractor's claims equaled 7.12 while the average Claim Event Severity Index of the employer's claims was 6.20. Due to these reasons, the Claim Event Impact Indices of the contractors was much higher than those of the private and public employers (4.03 for contractors and 3.07 for employers). These findings supported the

project employers' need to establish good claim management for substantiating contractor's claims.

Table 3-8 Frequency, Severity and Impacts of Employer's Claim-entitling Events

Type of Claim	Frequency	Frequency Index (from 10)	Severity Score	Severity Index (from 10)	Impact Index (from 10)
1. Ex-contractual					
G1)Breach of Contract	2.25	4.18	2.38	5.95	5.75
G2)Quantum Meruit	2.16	4.01	2.07	5.18	4.80
G3)Tort	1.27	2.36	2.79	6.98	3.80
G4)Repudiated or Frustrated	1.75	3.25	2.88	7.20	5.41
G5)Rectification	1.19	2.21	2.26	5.65	2.89
G6)Rescission	0.94	1.75	2.04	5.10	2.06
G7)Injunction	3.30	6.13	2.90	7.25	10.27
G8)Misrepresentation	1.67	3.10	2.00	5.00	3.58
All Ex-contractual Claims*	14.53	26.99	2.47	6.18	2.47
2. Ex-gratia					
G9)Ex-gratia	1.04	1.93	1.91	4.78	2.13
3. Contractual					
G10)Claim for Service Provided[4.19]	2.50	4.65	1.65	4.13	4.43
G11)Claim for Retesting[7.5]	5.38	10.00	2.42	6.05	13.97
G12)Claim for Failure to Remedy Defected Works[7.6]	3.66	6.80	2.85	7.13	11.19
G13)Claim for Revised Method[8.6]	2.48	4.61	2.61	6.53	6.95

Table 3-8 Frequency, Severity and Impacts of Employer's Claim-entitling Events (Cont.)

Type of Claim	Frequency Index	Frequency Index (from 10)	Severity Score	Severity Index (from 10)	Impact Index (from 10)
G14)Claim for Delay Damages[8.7]	2.36	4.39	3.19	7.98	8.08
G15)Claim for Failure to Pass on Tests on Completion[9.4]	1.33	2.47	2.30	5.75	3.28
G16)Claim for Extension of Defects Notification Period[11.3]	1.07	1.99	2.78	6.95	3.19
G17)Claim for Failure for Remedying Defects[11.4]	1.56	2.90	2.90	7.25	4.85
G18)Claim for Cost Indemnified[17.1]	1.06	1.97	1.96	4.90	2.23
G19)Claim for Failure to Effect Insurance[18.1]	0.40	0.74	1.79	4.48	0.77
G20)Claim for Unavailable Insurance for Works and Contractor's Equipment [18.2]	0.22	0.41	1.57	3.93	0.37
All Contractual Claims*	22.02	40.93	2.51	6.28	3.57
Overall Claims*	37.59	69.85	2.48	6.20	3.07

* By finding: (1) summation for frequency and (2) weighted average for severity and impact

There are no significant differences in the frequency, and the severity of the private and public employers' rights to claim, as seen from the significance values from Mann-Whitney Tests of 0.357 and 0.204 respectively.

Table 3-9 Frequency, Severity and Impacts of Contractor's Claim-entitling Events

Type of Claim	Frequency Index	Frequency Index (from 10)	Severity Score	Severity Index (from 10)	Impact Index (from 10)
1. Ex-contractual					
C1)Breach of Contract	2.45	2.89	2.36	5.90	2.16
C2)Quantum Meruit	4.74	5.59	2.39	5.98	4.22
C3)Tort	1.10	1.30	2.48	6.20	1.02
C4)Repudiated or Frustrated	3.07	3.62	2.71	6.78	3.10
C5)Rectification	2.74	3.23	2.77	6.93	2.83
C6)Rescission	1.23	1.45	2.38	5.95	1.09
C7)Injunction	2.39	2.82	2.65	6.63	2.36
C8)Misrepresentation	3.29	3.88	2.75	6.88	3.37
All Ex-contractual Claims*	21.01	24.78	2.80	6.44	2.33
2. Ex-gratia					
C9)Ex-gratia	4.10	4.83	3.14	7.85	4.80
3. Contractual Claim					
C10)Claim for Delayed Drawings or Instructions [1.9]	8.22	9.69	2.93	7.33	8.98
C11)Claim for Failure to Give Right to Access to the Site[2.1]	2.44	2.88	3.21	8.03	2.92
C12)Claim for Errors in Setting Out [4.7]	4.18	4.93	3.14	7.85	4.89
C13)Claim for Unforeseeable Physical Conditions [4.12]	3.07	3.62	3.14	7.85	3.59

Table 3-9 Frequency, Severity and Impacts of Contractor's Claim-entitling Events (Cont.)

Type of Claim	Frequency Index	Frequency Index (from 10)	Severity Score	Severity Index (from 10)	Impact Index (from 10)
C14)Claim for Archeological Finding[4.24]	0.34	0.40	1.64	4.10	0.21
C15)Claim for Force Majeure[19.4]	1.81	2.13	2.89	7.23	1.95
C16)Claim for Variations[13.1,7.4,8.4, 12.4]	8.48	10.00	3.38	8.45	10.69
C17)Claim for exceptionally adverse climatic conditions[8.4]	5.45	6.43	2.70	6.75	5.49
C18)Claim for Unforeseeable Shortage[8.4]	4.07	4.80	3.00	7.50	4.55
C19)Claim for Interference with Contractor's Work[8.4]	3.82	4.50	2.46	6.15	3.50
C20)Claim for Delays Caused by Authorities[8.5]	3.26	3.84	2.64	6.60	3.21
C21)Claim for Suspension[8.9]	1.85	2.18	2.75	6.88	1.90
C22)Claim for Employer's Taking Over of Parts of Works[10.2]	1.60	1.89	2.05	5.13	1.22

Table 3-9 Frequency, Severity and Impacts of Contractor's Claim-entitling Events (Cont.)

Type of Claim	Frequency Index	Frequency Index (from 10)	Severity Score	Severity Index (from 10)	Impact Index (from 10)
C23)Claim for Interference with Tests on Completion[10.3]	0.33	0.39	2.09	5.23	0.26
C24)Claim Instruction to Search[11.8]	3.09	3.64	2.44	6.10	2.81
C25)Claim for Saving with Value Engineering[13.2]	5.32	6.27	2.45	6.13	4.86
C26)Claim for Changes in Legislation[13.7]	1.17	1.38	2.57	6.43	1.12
C27)Claim for Delayed Payment[14.8]	8.14	9.60	3.57	8.93	10.84
C28)Claim for Cost Indemnified[17.1]	0.84	0.99	2.17	5.43	0.68
C29)Claim for Employer's Risks[17.4]	1.11	1.31	2.44	6.10	1.01
C30)Claim for Failure to Effect Insurance[18.1]	0.49	0.58	2.00	5.00	0.37
All Contractual Claims*	69.08	81.45	2.91	7.29	4.70
Overall Claims*	94.19	108.16	2.90	7.12	4.03

* By finding: (1) summation for frequency and (2) weighted average for severity and impact

1. Contractual claim

Compared with other types of claims, the events justifying the rights to claim on contractual claim basis got the highest frequency and impact. This emphasizes the importance of good preparation of the construction contract at the beginning of the project. A well-prepared construction contract can help both the project employers and

the contractors settle the changes that occur before they become the claims or disputes, which consume much more time and costs for both parties to solve.

2. Ex-contractual claim

Ex-contractual claims or extra-contractual claims also have a high level of effects on projects, which can be seen from their frequency and impact. This implies that both parties need not only deliberate scrutiny of contract documents, but also the familiarity with the laws, regulations, and other standards of works related to the work. This helps them avoid or more efficiently settle the changes that have occurred.

3. Ex-gratia claim

The ex-gratia claims are the least frequent claims occurring for all three groups. They seem to have a low impact on the employers but they play important roles for the contractors. The highest severity ranked by the respondents from the contractors' organizations implied that even though ex-gratia claims occur not very often in the projects, the contractors felt that they have a high level of impact to their performances. This finding was supported by the fact that some respondents reported that their project employers sometimes asked them to do work out of the original scope of the contracts. These contractors also informed that they have to follow these requests because of their expectation of prospective work in the future.

The Claim Event Frequency Indices and the Claim Event Severity Indices were used in calculating the Claim Event Impact Indices. In addition, the ratio between the employer's and the contractor's Claim Event Frequency Indices for all types of claims was used as the weight between active claim management processes and defensive claim management processes in calculating the overall claim management efficiency, as shown in Table 3-10. The Claim Event Severity Indices and the Claim Event Impact Indices indicate the event that should be given high level of attention from the parties in claim identification sub-process. Details of how to use these indices in the sub-process will be discussed in Section 7.2 [Proposed Claim Management System]. Finally, the Claim Event Impact Indices were used as inputs in the Claim Data Importance Analysis described in the next chapter.

3.2.3 Efficiency of the Existing Claim Management Systems

In order to know how well the employers and the contractors manage the construction claims that occur in their projects, the Claim Management Efficiency Index was defined and calculated from the sampled respondents, both from employers' and contractors' organizations. The higher Claim Management Efficiency Index, the higher efficiency of the claim management process or the relevant claim management sub-processes (as the case may be).

The Claim Management Efficiency Index, which presents the efficiency of all sampled respondents, can be calculated by averaging all the respondents' answers for each question in the collected questionnaires and then changing the denominators of the acquired efficiency score from 4 to 10 by multiplying by 10/4 in order to change the Claim Management Efficiency Index from the 4-scaled basis used in the questionnaires to the 10-scaled basis according to the following formula:

$$\text{Claim Management Efficiency Index}_i = \frac{10}{4} (\text{Efficiency Score}_i) \quad (3-5)$$

The Claim Management Efficiency Indices of every task of both the employers' and the contractor's claim management sub-processes and of the overall process are shown in Table 3-10.

Because there is no clear activity that both the employers and the contractors have to perform in the defensive "Claim Notification" sub-process, the efficiency to perform defensive claim notification of both the employers and the contractors were not assessed.

It should be noted that to avoid the effect from the difference between the respondents from employers' and from contractors' organizations, all indices were standardized before comparing the employers' and contractors' efficiency. However, the standardized Z scores of the arithmetic means of the efficiency indices equals zero. Therefore, the standardized efficiency indices of the overall processes of the employers and the contractors cannot be compared by this method.

Table 3-10 Efficiency of the Claim Management Processes

No.	Process	Public Employer						Contractor	
		Private		Public		Combined			
		X_i	Z_i^*	X_i	Z_i^*	X_i	Z_i^*	X_i	Z_i^*
	1. Active Sub-processes								
1.	Claim Identification	6.83	-0.84	8.05	1.07	7.65	0.50	7.23	0.44
2.	Claim Notification	7.50	1.08	7.95	0.76	7.80	1.03	6.88	-0.30
3.	Claim Documentation	7.50	1.08	7.73	0.05	7.65	0.50	7.40	0.81
4.	Claim Analysis and Preparation	6.95	-0.48	7.58	-0.43	7.35	-0.57	7.33	0.66
5.	Claim Negotiation	6.83	-0.84	7.25	-1.45	7.10	-1.46	6.25	-1.62
	Overall Active Processes	7.12	0.00	7.71	0.00	7.50	0.00	7.03	0.00
	2. Defensive Sub-processes								
6.	Claim Identification	6.83	-1.16	7.38	-0.20	7.18	-0.65	6.03	-1.33
7.	Claim Notification	-	-	-	-	-	-	-	-
8.	Claim Documentation	8.18	1.16	8.08	1.39	8.10	1.39	6.43	0.11
9.	Claim Analysis and Preparation	7.73	0.39	7.38	-0.20	7.50	0.07	6.70	1.10
10.	Claim Negotiation	7.28	-0.39	7.03	-0.99	7.10	-0.81	6.43	0.11
	Overall Defensive Processes	7.50	0.00	7.48	0.00	7.48	0.00	6.40	0.00
	Overall Processes**	7.40	0.00	7.55	0.00	7.48	0.00	6.85	0.00

Remarks: * used for comparing between the employers' and the contractors' efficiency

** weighted average using the average numbers of occurrences in one project

The Claim Management Efficiency Indices indicated the weak and strong points in the claim management processes of both types of employers as well as contractors. Between employers and contractors, on average, the activities in which the combined

employers have higher efficiency than those of the contractors are active identification, claim notification, active claim negotiation, defensive claim identification, and defensive claim documentation while the rest are performed better by the contractors.

Public employers seem to have higher active claim management efficiency, as seen from the higher indices in all active claim sub-processes. One of the reasonable reasons is that the government standard contract gives public employers dominating power and is silent on the contractors' rights to claim against the employers in various circumstances (Chovichien and Tochaiwat, 2002a-b, 2003a-b, 2004a-b).

On the other hand, the private employers seem to have higher efficiency in managing defensive claims. This can be supported by the result that the private employers' defense Claim Management Efficiency Indices are higher than those of the public employers in almost all sub-processes except the defensive identification and defensive notification (with no Claim Management Efficiency Index).

The public employers and the contractors seem to play active claim management roles, as seen from the higher overall active claim management indices. The activity that the private employers, on average, can perform well is keeping documents for substantiation of claims against them while they should improve their identification and negotiation abilities. The private employers are also good at keeping documents for substantiation of the contractors' claims but they are not good at negotiating such claims. On the other hand, the contractors are good at documentation for their claims against the employers while they are poor in identification of the employers' claims against them.

3.2.4 Availability of Each Claim Data

The Claim Data Availability Index was defined as an index used in determining the degree of accessibility of a data in the project management process. The Claim Data Availability Index of each data can be calculated by:

1. finding the arithmetic mean of all respondents' answer (0 to 4, where 0 represents most difficult to acquire and 4 means easiest to acquire), for each corresponding question.

2. changing the denominators of availability score obtained from step 1 from 4 to 10 by multiplying by 10/4 in order to change the Claim Data Availability Index from the 4-scaled basis used in the questionnaires to the 10-scaled basis that is more suitable for calculation and interpretation, as shown in the following formula:

$$\text{Claim Data Availability Index}_i = \frac{10}{4}(\text{Availability Score}_i) \quad (3-6)$$

The acquired Claim Data Availability Indices, accompanied by the Claim Data Importance Indices acquired in the Claim Data Importance Analysis, were used in classifying data in order to select the appropriate strategy for dealing with them. Table 4-2 in Section 4.2 [Claim Data Importance Index] shows the Claim Data Availability Index of all claim data necessary to manage construction claims.

3.2.5 Problems and Recommendations

There were several problems and recommendations collected by the questionnaire survey. They, as well as those from interviews, were the input of the Problem-Cause-Solution Analysis, the following step of the research. Table 3-11 shows the problems and recommendations collected from the questionnaire survey. The details and discussion of the problems and recommendations from the questionnaire survey can be found in the Problem-Cause-Solution Analysis, in the next chapter.

Table3-11 Problems and Recommendations Collected from Questionnaire Survey

	Problem	Recommendation
Employer	1. Difference in Contract Interpretation 2. Incomplete Contract Documents 3. Incomplete Variation Orders 4. Employers' Lack of Construction Knowledge	1. Establishing Effective Data Management System 2. Avoidance of Unnecessary Claims 3. Preparing Complete Contract Documents 4. Deliberate Controls of Payments

Table3-11 Problems and Recommendations Collected from Questionnaire Survey(Cont.)

	Problem	Recommendation
Employer (Cont.)	5. Contractors' Lack of Contract Knowledge	5. Maintaining Professional Ethics
	6. Incompetent Contractors	6. Establishing Effective Coordination
	7. Contractors' Lack of Claim Management Skills	7. Specifying Appropriate Defects Liability Period
	8. Contractors' Failures to Comply with the Warranty Conditions	8. Issuing Clear Variation Orders
	9. Contractors' Refusal of Responsibilities	9. Complying with Related Regulations
	10. Impractical Designs	10. Demanding Contractors to Propose Details of Construction Methods before Performing Works
	11. Engineers' Delays in Response to Claims	11. Analyzing Outcomes before Issuing Variation Orders
	12. Contractors' Delays in Response to Claims	12. Selecting the Competent Contractors
	13. Insufficient Time Allowable for Claims	13. Selecting the Competent Engineers
	14. Different Claim Amounts Calculated by Parties	14. Enhancing Project Flexibility
	15. Ignorance of Some Contract Provisions by Contractors	15. Specifying Reasonable Reference Prices
	16. Contractors' Ignorance of Professional Ethics	
	17. Bureaucratic Regulations Related to Claims	
	18. Lack of Necessary Data	
	19. Oral or Multi-persons Variation Orders	
	20. Lack of Clear Regulations	

Table3-11 Problems and Recommendations Collected from Questionnaire Survey(Cont.)

	Problem	Recommendation
Employer (Cont.)	21. Corruption 22. Unclear Engineers' Responsibilities	
Contractor	1. Incomplete Contract Documents 2. Much Higher Bargaining Power of the Employers 3. Delay of Engineers' Responses 4. Employers' Lack of Construction Knowledge 5. Partiality of Engineers 6. Contractors' Lack of Contract Management Skills 7. Change Orders without Clear Agreements 8. Bureaucratic Regulations Related to Claims of the Employers' Organizations 9. Corruption	1. Deliberate Scrutinizing of Contract Documents 2. Enhancing Cooperative Atmosphere 3. Efficient Claim Data Collection 4. Prompt Notification of the Entitlement to Claims 5. Signing Separate Contracts for the Large-Amounted Variation Orders 6. Improvement of Related Laws, Regulations, and Standards 7. Establishing Claim Settlement Organizations

Claim problems occur from both the claim management and other relevant processes such as contract management, project management, construction management, procurement, etc. The problems reported by the employers that were directly relevant to the construction claim process consisted of contractors' lack of claim management skills, engineers' and contractors' delays in response to claims, insufficient time allowable for claims, differing claim amounts calculated by the parties, bureaucratic claim regulations, lack of necessary data, and employer's prevailing powers while the problems reported by the contractors were engineer's delay in response to claim, bureaucratic claim regulations, and employers' prevailing powers. To avoid or remedy

these problems, the employers suggested that unnecessary claims shall be avoided and the contractors recommended collecting the claim-supporting data efficiently, promptly notifying the claim entitlement, and establishing a claim settlement division.

Because the contract management process is very close to the claim management process, there were several claim management problems that were relevant to the contract management. From the questionnaires, several respondents from the employers' organizations revealed various problems such as difference in contract interpretation, incomplete contract documents, incomplete variation orders, contractors' lack of contract knowledge, contractors' failures to comply with the warranty obligations, ignorance of some contract provisions by contractors, oral variation orders, multi-person variation orders, and unclear engineers' responsibilities. In addition, the contractors also revealed some problems such as incomplete issuance of variation orders and contractors' lack of contract knowledge. In addition, the respondents also gave several suggestions. The employers suggested preparing complete contract documents and pre-analyzing and issuing clear variation orders. Some respondents recommended contract drafters for specifying appropriate Defects liability period that is sufficient for the employers to notice of the defects in works and fair to contractors. As to the contractors' comments, they suggested deliberate scrutinizing of the contract documents and signing separate contract for large-amount variation orders.

There were various recommendations suggested by the employers in avoiding the problems related to project management. They consisted of complying with related regulations, and enhancing project flexibilities and cooperative atmosphere. The contractors suggested that some related laws, regulations, and standards needed to be reviewed and improved. As to the construction management, the relevant claim management problems was employers' lack of construction knowledge while the recommendations were deliberate controls of payments and demanding contractors to propose details of the construction methods before performing work.

The employers suggested selecting competent contractors to solve the problems caused by incompetent or irresponsible contractors. Similarly, the competent engineers shall be procured. Impractical design was also a problem referred by the respondents. Finally, the reference prices shall be reasonable.

Professional ethics were also mentioned by several respondents. Some employer respondents referred to contractors' ignorance of professional ethics and corruption while the contractors were concerned about corruption and engineers' partiality. Professional ethics were viewed as very important and were recommended to be maintained. Details of the claim management problems as well as recommendations were further discussed in Chapter 6 [Problem-Cause-Solution Analysis].

3.3 Interview

3.3.1 Description

The objective of this step was to collect the details and problems of the existing claim management processes by interviewing a group of qualified persons from several organizations, in both public and private sectors. The interviewers' opinions about how to improve the claim management system in their organizations were also collected. In details, there were five sub-steps performed in this main step:

1. Preparing the interview topics

Since the data required to analyze and substantiate claims are from all parties concerned in every phase of the project, from the project initiation until project closeout, all processes of project management have to be considered in studying the claim management process and problems (Tochaiwat and Chovichien, 2004a). In order to be able to understand the main details of the existing claim management system within the limited time available to the interviewer, the "Use Cases" system analysis technique was adopted (Dennis and Wixom, 2000). This technique is simpler in format and easier to understand than directly creating the "Data Flow Diagram: DFD", as in the traditional method. The overall system was divided into several use cases: pre-construction phase, supervision, reporting progress, making interim payment, ordering change, filing claim, checking the other party's claim, taking-over, warranty, dispute resolution, and co-ordination with the contractor and other parties (designer, construction supervisor, related public authorities, etc.). The interview questions are shown in Figure 3-1.

Interview Questions

- What is the structure of the construction management department in your organization?
- Please describe the following process:
 1. Contractor Communication Process:
 - a. Pre-construction Phase
 - b. Coordination during Construction Phase
 - c. Contractor Performance Supervision
 - d. Project Progress Control
 - e. Payment
 - f. Variation Ordering
 - g. Filing Construction Claim against Contractor
 - i. Claim Identification
 - ii. Claim Notification
 - iii. Claim Data Collection
 - iv. Claim Analysis and Preparation
 - v. Claim Negotiation
 - h. Review Contractor's Claim Proposal against the Employer
 - i. Claim Identification
 - ii. Claim Notification
 - iii. Claim Data Collection
 - iv. Claim Analysis and Preparation
 - v. Claim Negotiation
 - i. Taking-over
 - j. Warranty
 - k. Dispute Resolution
 2. Coordination with (1) Designer, (2) Supplier, (3) Surety, and (4) Other organizations
- Does your organization have a standard form used for claim management purposes?
- What additional data should be collected for managing construction claims?
- What is your opinion about employing a claim engineer in your organization?

Figure 3-1 Interview Questions Used in System Analysis Phase

2. Selecting interviewees

The interviewees were obtained from the employers' organizations that participated in the former questionnaire survey. The heads of the employers' organizations (18 public organizations and 17 consultant companies) were asked to nominate one or more qualified persons to participate in the interview process. The interviewees' working experiences and their maximum experienced contract values were used in separating the unqualified interviewees. The contract value of 20 million baht (approximately 500,000 dollar recommended by the Fédération Internationale des Ingénieurs-Conseils (FIDIC) for separating middle-sized projects and large projects (Booen, 1999)) was used as the dividing point. The respondents who have lower maximum experience contract values than the dividing point were screened out.

Table 3-12 shows the percentage of each employer's organization type in Thailand calculated from their GDP (NESDB, 2004), numbers of organizations (or interviewees) asked and actually participated in the interview. It also shows the number of organizations and respondents sampled in the questionnaire survey.

Table 3-12 Types of Organizations of Interviewees

Organization Type	National Distribution (%)	Number of Organizations (Organizations)		
		Questionnaire Survey	Requested	Interviewed
1. Public Organization	67.73	64 (66.67%)	18 (51.43%)	14 (66.67%)
2. Consulting Company Firms	32.27	32 (33.33%)	17 (48.57%)	7 (33.33%)
Total	100.00	96 (100.00%)	35 (100.00%)	21 (100.00%)

3) Performing interview

Twenty-nine key project staff members, who were responsible for managing construction claims and those whose works supported the claim management process such as lawyers, public procurement officers and accountants, from 14 public

authorities and 7 private consulting companies participated in this research. During interviews, the interviewees were asked to explain how they perform each sub-process listed in step 1 and the documents used in each sub-process.

As to the claim management issue, interviewees were asked about how they dealt with construction claims, both in cases where they filed against their contractors and vice versa. In addition, the problems of their existing claim management systems and their suggestions for improving their systems were also collected.

Table 3-13 and Table 3-14 show the amount of data collected for each type of work and the number of interviewees participating in the research, classified by their field of expertise.

Table 3-13 Types of the Construction Works Referred by the Interviewees

Types of the Construction Works Referred	Number of Interviewees (Organizations)
1. Public Project	15
2. Private Project	4
3. Both Private and Public	2
Total	21

Table 3-14 Interviewees Classified by Their Field of Expertise

Field of Expertise	Number of Interviewees (Persons)
1. Engineer	23
2. Architect	2
3. Procurement Officer	2
4. Lawyer	1
5. Accountant	1
Total	29

4) Analysis of the interview results

In this step, the interview results collected in step 3 were compared with international claim management concepts or practices. The difference will be filtered and grouped into a number of categories, as discussed in Chapter 6 [Problem-Cause-Solution Analysis].

3.3.2 Thai Employers' Existing Claim Management System

1. Public project

Thai public organizations have to comply with government regulations. In procurement process, the “Prime Minister’s Office Regulations Governing Procurement 1992” is the main regulation covering the public procedures in purchasing hardware, hiring contractors, hiring consultants, etc. According to such regulation, claim management responsibilities belong to an “employment supervisory committee”, which consist of a chairman and at least two qualified persons. The committee has power to (1) review the reports from the contractor and the construction supervisor, (2) perform field supervision and variation order, and (3) approve interim payment (Office of the Council of State, 2005).

Construction supervisors, nominated from the in-house staff or from other public authority (for some projects of small public organizations), have the responsibility to (1) supervise construction, (2) suspend work in case of the contractor’s failure to follow his instructions, dangerous working conditions, or a serious discrepancy in contract documents, (3) record daily contractor’s performance and prepare weekly reports to the employment supervisory committee, (4) give opinions to the committee about the contractor’s performance at the commencement date and before the approval of interim payments. For large projects, the public organization may employ a private consultant to work as a construction supervisor. In such cases, the private construction supervisor will have the same rights and responsibilities as the public construction supervisor (Office of the Council of State, 2005).

As to claim management for contractor’s claims, the committee also has power to determine the entitlement and the amount of compensation the contractor deserves

and make decision to file the claim against the contractor by using the reports and information supplied by the construction supervisor.

2. Private project

The forms of project organization, staff, and rights and responsibilities of each private project differ from one project to the other because of different sizes, industry situation, competition, and employer's requirements. However, the typical organization arrangement comprises: (1) project director, (2) project manager, and (3) various disciplines of project engineers. The project director is generally responsible for controlling several projects in the big picture while the project manager is responsible for controlling his project to complete it on time, within the budget established, and with acceptable quality. The types and number of project engineer crews differ depending on the size and details of projects. In medium-sized projects, there may be structural, electrical and mechanical engineers.

The power to make decisions about claims in private projects generally belongs to project managers. Generally, a site engineer has to submit daily reports to his project manager everyday and submit summary reports on a monthly basis.

3.3.3 Distinctive Features of Thai Employer's Claim Management

From the interviews, it was found that the Thai-style employer's claim management system differs from the international one in several aspects: the employers' attitude towards claims, the employers' prevailing power over their contractors, types of claims generally filed in the project, and the method of recovering damages.

1. Attitudes towards claims

While claims are used as a tool to enhance fairness among all parties participating in international construction projects, they are regarded as an unfriendly gesture in Thai construction industry. The interview results showed that the interviewees had different attitudes towards claims. Some regarded claims as the cause of disputes, which should be absolutely avoided. In Thai culture, people always try to solve problems in a very compromising way. The majority of the interviewees shared the opinion that they would rather avoid hiring a "pro-claiming" contractor, if possible. A

contractor who files claims against his employer is regarded as a “tricky” contractor who tries to seek “windfall” profit.

Some project employers’ staff members, especially those in the public sector, regarded claims as an indicator of the management inefficiency. The supervisors refused to grant the contractors compensation on the belief that granting compensation to the contractor is an indication of his own non-performance. Instead, they believed in the concept that the contractor shall bear all risks, no matter what the contract says.

Resulting from the above reasons, Thai contractors are normally reluctant to claim against their employers. Several interviewees expressed their opinion that claims did not have significant impact on their projects and claim management is not important.

2. Weak claim management systems

In international organizations, most employers and contractors are encouraged to set up a potential claim management system in their organizations. Documentation systems are developed to be used in substantiating and verifying claims. The rights and responsibilities of each project participant are well described by project manuals. Some staff members are specifically nominated to be responsible for monitoring claims.

In Thai construction industry, claim management responsibilities always belong to the project managers in private projects while they are the employment supervisory committees’ responsibility in public projects. In some organizations, they belong to the legal department. The main disadvantage of this arrangement is that the claims are usually neglected since both project managers and committees have many responsibilities and are too far from practical handling during the construction period. Potential claim management needs close attention from the project staff right from the project beginning till the project closeout.

The interview results show that the majority of Thai employers’ organizations, particularly those of public sector, have insufficient claim management systems. Documentation systems in several organizations were found to be insufficient. The contractors almost always have to cope with difficulties concerning the employers’ oral instructions. One interviewee accepted that his organization sometimes fails to exercise the rights to claim for defective work in the defect liability period and lets his contractors be discharged from their liabilities. Some interviewees admitted that their organizations

had to cope with difficulties when they had to work with contractors with well-managed claim management systems. In the public sector, only large organizations and some others whose management realized the importance of proper documentation have project manuals and practical project standard forms. In addition, the public supervisors had limited determination power and always responded late to the contractors' requests. This made the problems become more serious and harder to be settled.

As to the need for claim engineers, the majority of the interviewees agreed with the idea of assigning a person to be solely responsible for the claims in their projects, the reasons being: increased claim management efficiency, more time for other staff to do construction work, and higher level of contractors' attention to the works. On the other hand, some disagreed with the claim engineering concept. Their reasons consisted of lack of staff, increased paper-work, unfriendly working atmosphere, contractors' consent to bear damages, etc.

3. Employers' prevailing power over their contractors

According to the general principles of construction contracts, both employer and contractor have consideration and risks and responsibilities are usually fairly allocated by the contract. In case either party thinks he is entitled to the compensation from the other party, he has the right to claim against the other party.

However, Thai construction contracts are almost always inclined to the employers' side. Wonggumchai (1996) surveyed construction contracts used in twenty private projects and concluded that the majority of them were modified to be beneficial to the employers. For example, some of them were silent about the contractor's rights to claim and some were modified in such a way that the contractors had to literally bear all risks. As to public contracts, Bunsrangserm (2000) also found that the standard contract prepared by the Prime Minister's Office in 1992, which is compulsorily used in general public projects, is silent about the rights to claim of the contractors and tries to have almost all risks borne by the contractors.

Furthermore, interview results also showed other factors that undermine the contractors' and the employers' equality. The public standard form of contract specified the contractors' obligation to pay the construction supervisor's fee for non-excusable

delay, while not permitting additional payment to the supervisor in case of excusable delay or compensable delay. Such provision does not motivate construction supervisors to be impartial. Public regulations do not allow the contractors to claim for some cost components, which will be described in the following sections. Some public employers use red-tape as a tool for refusing or deferring additional payments to contractors.

Besides contract provisions, employers also have an advantage over contractors due to the high competition situation in the industry. Generally, contractors decide not to claim or have to follow the employers' requirement in exchange for a chance of subsequent employment.

4. Types of claims filed

Because the main objective of claims is to enhance the fairness to both contract parties, both contractors and employers should have the right to claim for any item they believe they deserve and which is verifiable. Adrian (1988) listed up to seventeen types of cost components of claims.

From the interviews, claims in Thai construction industry are limited to a few types. In public contracts, the contractors are generally granted additional payments only in cases of extra-work and price escalation. Other types of claim rarely find their way to compensation for the contractors. The claims filed in private projects normally prohibit claims for consequential damages. Table 3-15 shows the frequently-found claims for both employers' and contractors'.

5. The remedying mechanisms

In case of delay, according to construction law principles, the contractor shall be entitled to time extension only in case he suffers delay from the employers' breaches of contract (compensable delay) and from other reasons which are neither party's responsibility (Jervis and Levin, 1988). In substantiating the extension of time, there are several scheduling techniques that can be used (Tochaiwat and Chovichien, 2004b).

In Thai construction industry, especially in public projects, such scheduling techniques are seldom used. The employers normally grant their contractors a time extension equal to the number of days the contractors are delayed by the causes they are not liable for. In public projects, there are three causes of delays leading to time

extension: employer's fault, force majeure, or other reasons for the contractor to which both parties are not responsible.

Table 3-15 Frequently-found Claims in Thai Construction Industry

Type of Claim	Cause
1. Employers' Claims (against contractors)	<ul style="list-style-type: none"> a. Delay b. Quality of works c. Warranty d. Equivalent Material e. Breach of Contract f. Tort g. Termination h. Price escalation i. Omission
2. Contractors' Claims (against employers)	<ul style="list-style-type: none"> a. Price escalation b. Extra work c. Variation d. Site access delay e. Defect in drawings f. Poor co-ordination g. Incomplete BOQ h. Scope of works i. Tort j. Failure to make payment k. Poor design l. Poor engineer's performance

Remark: Data from the interviews.

Public projects always come with a fixed contract price ceiling. The employers have to omit some work in case there is extra-work in the project. On the other hand, if they want to deduct any unnecessary work, they have to compensate other work for their

contractors. Changing the contract price, involving processing through a number of government organizations, is a complex and annoying process for both contractors and employers.

3.3.4 Problems and Recommendations

There were several problems and recommendations collected from the interviews. Similar to those of the questionnaire survey, they were the input for the Problem-Cause-Solution Analysis, the following step of the research. Table 3-16 shows the problems and recommendations collected from the interviews.

Table 3-16 Problems and Recommendations Collected from the Interview

	Problem	Recommendation
General System	<ol style="list-style-type: none"> 1. Supervisors' Lack of Laws and Regulations Knowledge 2. Deficient Contract Provision Related to the Supervisors' Fee in Case of Excusable Delay (Public Project) 3. Lack of Personnel 4. Lawyers' and Engineers' Different Opinions 5. Unfair Contract Modification 6. Negligence of Claim Management 7. Negative Attitudes to Claims 8. Negligence of Contract Reviewing 9. Weak Enforcement of Regulations 10. Confusing and Unpredictable Regulations 	<ol style="list-style-type: none"> 1. Enhancing Consultants' Impartiality 2. Contract Knowledge Improvement 3. Increasing Equality between Employer and Contractor

Table 3-16 Problems and Recommendations Collected from the Interview (Cont.)

	Problem	Recommendation
General System (cont.)	11. Poor Performance of Some Contractors 12. So Many Regulations	
Claim Identification	1. Not Knowing the Right to Claim	-
Claim Notification	1. Failure to Give Notice	1. Reservation of Rights to Claim 2. Early Claim Notification
Claim Documentation	1. Not Knowing What Data are Required 2. Inconsistency between Departments 3. Failure to Submit Reports 4. Incomplete Records 5. So Many Documents 6. Unavailability of Written Document 7. Unavailability of Some Contractors' Data 8. Unavailability of Claim Standard Forms	1. Preparation of Standard Forms 2. Early Recording of Details of Claim-leading Events 3. Implementation of Efficient Document Control System 4. Written Documentation 5. Reducing Number of Documents
Claim Analysis	1. Unavailability of Concerning Regulation 2. Method of Calculation 3. Too Much Focusing on Wording of Provisions	1. Use of Productivity Data in Analysis 2. Taking account of the Effort to Relieve Damages, Urgency, and Easiness to Perform the Works 3. Establishing Academic Center 4. Use of Schedule Analysis

Table 3-16 Problems and Recommendations Collected from the Interview (Cont.)

	Problem	Recommendation
Claim Preparation	<ol style="list-style-type: none"> 1. Contractors' Preference to Dispute Resolution 2. Large Amount of Claims 3. Defects Occurring from Employers' Misuses of Works 5. Contractors' Over-estimation of Claim Damages 6. Contractors' Reluctance to Claim 	-
Claim Negotiation	<ol style="list-style-type: none"> 1. Employer's Prevailing Powers 2. Limited Decision Powers of the Employment Supervisory Committee (Public Project) 3. Difficulty in Correction of Contract Value (Public Project) 4. Ability to Claim for Some Claim Components 	<ol style="list-style-type: none"> 1. Use of Negotiation 2. Focusing on Reasons, not Wording 3. Engineer's Important Roles 4. Settlement by Comparison of Each Party's Records

The details and discussion of the problems and recommendations from interviews can be found in Chapter 6 [Problem-Cause-Solution Analysis].

3.4 Summary

This chapter presented the details, consisting of the objective(s), the steps, and the findings, of three data collection methods used in surveying the existing claim management system: Claim Data Requirement Analysis, questionnaire survey, and in-depth interviews.

The Claim Data Requirement Analysis analyzed and listed all data required by the employers in substantiating and pricing of 24 contractor's claim components and 23

employer's claim components, substantiating claim liabilities for contractual claims, ex-contractual claims, and ex-gratia claims, and recognizing of 25 events leading to claims. There were 105 pieces of important claim data found, which the employer requires in managing construction claims. The results from this analysis were used as one input in the questionnaire survey and Claim Document Importance Analysis phases.

The questionnaire survey aimed at finding the broad details of the claims and the existing claim management systems. Claim management staff members from 200 construction project employers' organizations, consisting of 136 public organizations and 64 private consultant companies, received three forms of questionnaires while those of 300 construction contractor companies nationwide received one form of the questionnaires. Appendix A shows examples of the questionnaires used in this research. There were several findings acquired from the questionnaire survey: the levels of importance of the claim-leading events, which can be shown in form of Claim Event Frequency Index, Claim Event Severity Index, and Claim Event Impact Index, efficiency of the existing employer's and contractor's claim management, availability of claim data that can be shown by the Claim Data Availability Index, problems of the existing claim management systems, and some recommendations for improving the systems. The findings were inputted into the various following steps: in-depth interview, Claim Data Importance Analysis, Problem-Cause-Solution Analysis, and system design.

Twenty-nine persons from fourteen public organizations and seven private consultant companies were interviewed in order to collect the details, problems of the existing claim management processes, and the interviewees' opinions about how to improve the claim management systems. Interview results elaborated the existing claim management processes adopted by Thai employers, in both public and private sectors, and some important distinctive features of Thai claim management practices: (1) the employers' attitudes towards claims, (2) the employers' prevailing power over their contractors, (3) types of claims generally filed in projects, and (4) the methods of recovering damages. Results also showed problems of the existing systems and some recommendations that could help employers increase their claim management efficiency, which will be further discussed in the topic "Problem-Cause-Solution

Analysis". These results were used in the Problem-Cause-Solution Analysis and system design.

All results acquired in this chapter answered the following questions: (1) which data and claim-leading events should be given a high level of attention, (2) which claim management tasks that employers and contractors normally perform well and which tasks should be improved, (3) what the claim management problems are and how to improve existing claim management systems, (4) what the distinctive features of construction claim management in Thai construction industry are. These acquired results also showed the nature of construction claims, illustrated existing claim management processes, especially those of Thai construction project employers, and were inputs for the following research steps, as described in the following chapters.



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER IV

CLAIM DATA IMPORTANCE ANALYSIS

In this chapter, the data collected from Chapter 3 [Survey of the Construction Claim Management Systems] were used as inputs in the Claim Data Importance Analysis. Claim Data Importance Analysis aimed to analyze the claim data acquired from the Claim Data Requirement Analysis to find their levels of importance in claim management processes, which can be shown in the form of “Claim Data Importance Indices”. Because this analysis was related to a large number of data, events, and cost components, the calculations in this analysis were performed in the form of matrices. The results acquired from this analysis were used in Claim Document Importance Analysis and in designing the proposed claim management system, the following phases of the research.

4.1 Description

4.1.1 Matrix Analysis

Because the calculations performed in this analysis were related to a large number of claim data, claim-leading events, and claim components, they were done in the form of matrices, as described below. As to the matrix calculation, provided that matrix $[A - B]_{p \times q}$ represents a matrix with p rows and q columns that shows relationships among each member of set A and set B . Crossing matrix $[A - B]_{p \times q}$ with matrix $[B - C]_{q \times r}$ gives matrix $[A - C]_{p \times r}$, a matrix with p rows and r columns that shows relationships among each members of set A and set C , as the following formula:

$$[A - B]_{p \times q} \times [B - C]_{q \times r} = [A - C]_{p \times r} \quad (4.1)$$

Each member of the matrix, ac_{ij} represents the member of matrix $[A-C]$ locating in row i and column j . The member ac_{ij} can be calculated by the following formula:

$$ac_{ij} = \sum_{n=1}^{n=q} (ab_n \cdot xbc_{nj}) = ab_{i1} \cdot xbc_{1j} + ab_{i2} \cdot xbc_{2j} + ab_{i3} \cdot xbc_{3j} + \dots + ab_{iq} \cdot xbc_{qj} \quad (4.2)$$

From the above equation, relationship ac_{ij} can be construed as summation of all relationships between the member number i of set A and number j of set C taking account of all members of set B. This construction is true if the unit of the relationship ac_{ij} is the same as the unit of the result of $ab_{ij} \times bc_{ij}$.

The number of terms of the sequence in Equation 4.2 is q . Therefore, if ac_{ij} is divided by q , the arithmetic means of the relationships between the members number i of set A and number j of set C as the following equation:

$$\frac{ac_{ij}}{q} = \frac{ab_{i1} \cdot xbc_{1j} + ab_{i2} \cdot xbc_{2j} + ab_{i3} \cdot xbc_{3j} + \dots + ab_{iq} \cdot xbc_{qj}}{q} = \overline{ab_i \cdot xbc_{.j}} \quad (4.3)$$

From equation 4.3, crossing matrix $[A - B]_{p \times q}$ with matrix $[B - C]_{q \times r}$ and then divided by the number of columns of matrix $[A - B]_{p \times q}$ or number of rows of matrix $[A - B]_{p \times q}$ (equals to q) gives a matrix with p rows and r columns that shows average relationships among each members of set A and set C, as the following formula:

$$\frac{1}{q} ([A - B]_{p \times q} \times [B - C]_{q \times r}) = \frac{1}{q} [A - C]_{p \times r} = \overline{[ab_i \cdot xbc_{.j}]_{p \times r}} \quad (4.4)$$

The above concept was used in analyzing the Claim Data Importance Index, as described in the following sections.

4.1.2 Methodology

The importance of each piece of data can be shown by its "Claim Data Importance Index" calculated in the following steps. The details of the matrices created in this analysis are shown in Table 4-1 while Figure 4-1 summarizes the calculation procedure.

1. Create "Basic Event - Impact Matrix."

A 50x1 matrix containing Claim Event Impact Index of the Basic Events to a project was created. Basic Events are the events that entitle the claimants to the rights

to claim. Lists of the employer's and contractor's Claim Event Impact Indices were shown in Tables 3-8 and 3-9 of Chapter 3 respectively.

2. Create "Alarming Event - Basic Event Matrix."

Contrary to Basic Events, Alarming Events are the events that notify the employers of claims that are potentially or likely to occur in their projects. In this research, 25 Alarming Events proposed by Adrian (1988), discussed in Section 2.2.1 [Claim Identification], were adopted. The Alarming Event - Basic Event Matrix that contains the relationships between each Alarming Event and Basic Event. Value "1" showed that this Alarming Event always occurs before the respective Basic Event while value "0" gave the opposite meaning.

3. Calculate "Alarming Event - Impact Matrix" and "Event - Impact Matrix."

The Alarming Event - Impact Matrix showed Claim Event Impact Index of each Alarming Event. Because Alarming Events do not direct cause damages to projects, Their Claim Event Impact Indices were assessed by using Claim Event Impact Indices of the Basic Events, as shown in the following equation:

$$\left[\text{ALARMING EVENT} - \text{IMPACT} \right] = \frac{1}{50} \left[\text{ALARMING EVENT} - \text{BASIC EVENT} \right] \times \left[\text{BASIC EVENT} - \text{IMPACT} \right] \quad (4.5)$$

After obtaining the Claim Event Impact Indices of all Alarming Events, the Event - Impact Matrix can be acquired by merging the Basic Event - Impact Matrix with the Alarming Event - Impact Matrix, as follows:

$$\left[\text{EVENT} - \text{IMPACT} \right] = \left[\text{BASIC EVENT} - \text{IMPACT} \right] \text{ merged with } \left[\text{ALARMING EVENT} - \text{IMPACT} \right] \quad (4.6)$$

4. Calculate "Data - Basic Event Matrix (for Contractual Claim)."

As discussed in the Claim Data Requirement Analysis Section, in substantiating or analyzing construction claims, three aspects have to be analyzed: claim liability, claim cost quantum, and claim time quantum. For this reason, in calculating the relationship between each piece of data and each Basic Event, the analysis was performed in all three aspects and the highest results were then selected.

a. Create “Data - Contractual Claim Damage Matrix.”

First, a matrix showing relationships between each piece of claim data and each type of claim damages (claim cost component) was created. If the considered piece of data is necessary to calculating the respective claim component, value “1” was assigned while value “0” was assigned to the data not related to the considered claim component.

b. Create “Contractual Claim Damage - Basic Event Matrix.”

The Contractual Claim Damage - Basic Event Matrix was created by adopting the relationships between each contractual claim damage (claim component) and each event entitling the parties to the rights to contractual claim (Basic Event) suggested by Adrian (1988).

c. Calculate “Data - Basic Event Matrix (for Contractual Claim Damage).”

The Data - Basic Event Matrix used in analysis of contractual claim damages was obtained by crossing between the Data – Contractual Claim Damage Matrix and the Contractual Claim Damage – Basic Event Matrix, as shown in Equation 4.7:

$$\left[DATA - BASIC \text{ EVENT}(Contractual \text{ Damage}) \right] = \frac{1}{42} \left[DATA - CONTRACTUAL \text{ CLAIM \text{ DAMAGE}} \right] \times \left[CONTRACTUAL \text{ CLAIM \text{ DAMAGE}} - BASIC \text{ EVENT} \right] \quad (4.7)$$

d. Create “Data - Basic Event Matrix (for Contractual Claim Liability).”

The role of each claim data in analyzing claim liability of each Basic Event was analyzed and stored in the Data – Basic Event Matrix (for Contractual Claim Liability). Value “1” showed the important role while value “0” showed that the data was necessary to perform the considering claim liability analysis.

e. Calculate “Data - Basic Event Matrix (for Contractual Claim).”

Each value contained in the “Data - Basic Event Matrix (for Contractual Claim)” was derived by comparing the value in the “Data - Basic Event Matrix

(for Contractual Claim Damage)” with the “Data - Basic Event Matrix (for Contractual Claim)”, as in the following equation:

$$VALUE_{ij} = \max(VALUE_{ij \text{ DAMAGE}}, VALUE_{ij \text{ LIABILITY}}) \quad (4.8)$$

5. Calculate “Data - Basic Event Matrix (for Non-contractual Claim)” for ex-contractual and ex-gratia claims.

Similar to the “Data - Basic Event Matrix (for Contractual Claim)”, each value in the “Data - Basic Event Matrix (for Non-contractual Claim)” was calculated by finding the maximum value of each respective value in the (1) “Data - Basic Event Matrix (for Non-contractual Claim Cost)”, (2) “Data - Basic Event Matrix (for Non-contractual Claim Time)”, and (3) “Data - Basic Event Matrix (for Non-contractual Claim Liability)”. Note that there was one difference between the methods used in contractual and non-contractual cases: all relationships were analyzed in creating the Data – Basic Event Matrix (for Non-contractual Claim Cost) while a former work was referred in the case of Data – Basic Event Matrix (for Contractual Claim Damage).

- a. Create “Data - Basic Event Matrix (for Non-contractual Claim Cost).”
- b. Create “Data - Basic Event Matrix (for Non-contractual Claim Time).”
- c. Create “Data - Basic Event Matrix (for Non-contractual Claim Liability).”

6. Calculate “Data - Basic Event Matrix (for Non-contractual Claim).”

$$VALUE_{ij} = \max(VALUE_{ij \text{ TIME}}, VALUE_{ij \text{ COST}}, VALUE_{ij \text{ LIABILITY}}) \quad (4.9)$$

7. Create “Data - Alarming Event Matrix.”

The data that notify the employer of occurrences of each Alarming Event were analyzed. A 105x25 matrix was filled with the value “0”, “0.5”, and “1”, which meant the data were never required, sometimes required, and usually required in the notification of the considering Alarming Event respectively.

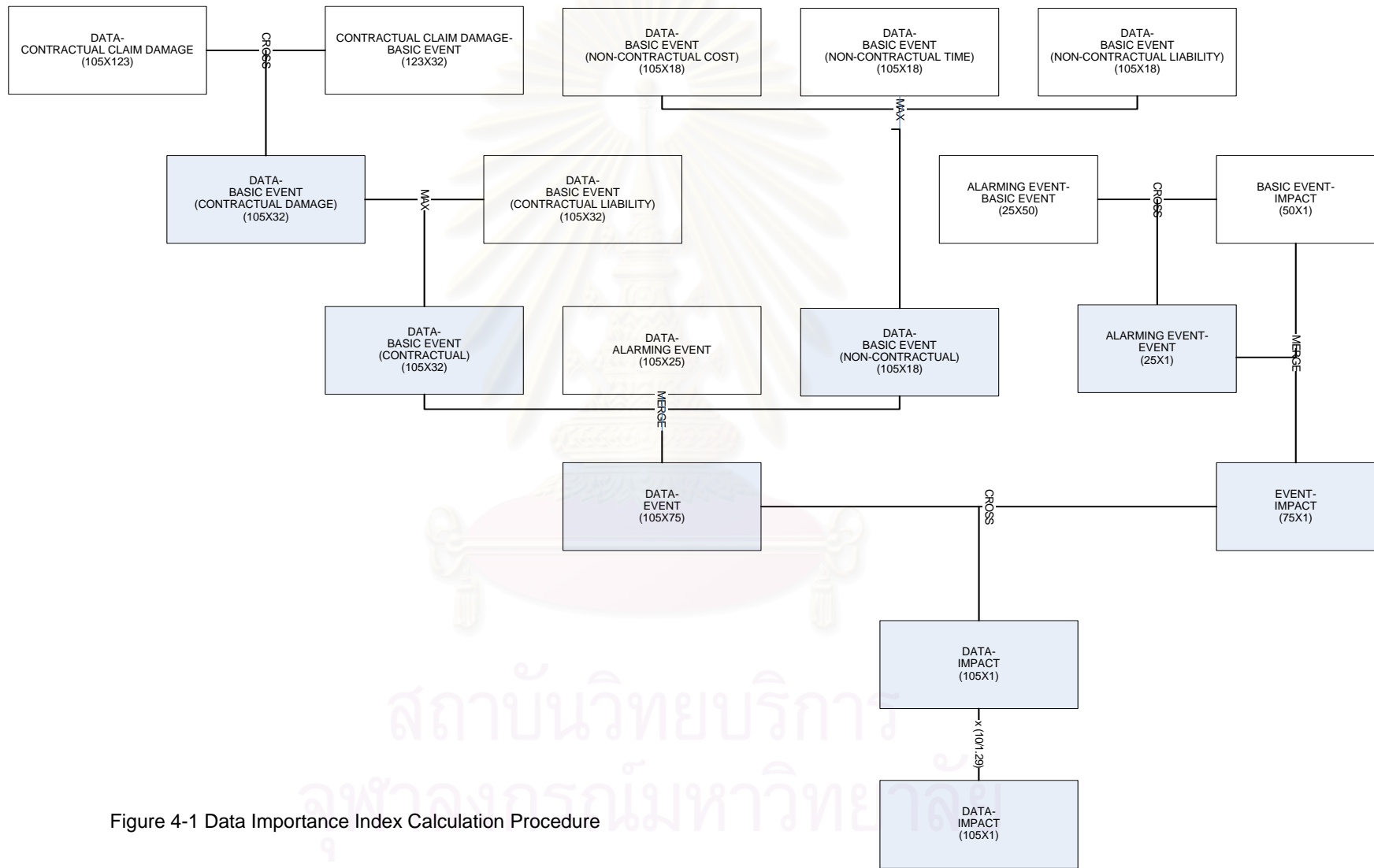


Figure 4-1 Data Importance Index Calculation Procedure

8. Create “Data - Event Matrix.”

The “Data - Event Matrix” is the matrix that shows the level of importance of each piece of data for substantiation and calculation on each Basic Event, or on identification of each Alarming Event, as the case may be. This matrix was created by merging the (1) Data – Basic Event (for Contractual Claim), (2) Data – Basic Event (for Non-contractual Claim), and (3) Data – Alarming Event altogether.

$$[DATA-EVENT] = \left[\begin{array}{l} [DATA-BASIC \text{ EVENT}(Contractual)] \\ \text{merged with } [DATA-BASIC \text{ EVENT}(Non-contractual)] \\ \text{merged with } [DATA-ALARMING \text{ EVENT}] \end{array} \right] \quad (4.10)$$

9. Calculate “Data - Impact Matrix.”

Next, the “Data - Impact Matrix”, which represents the impact of each piece of data in the employer’s claim management process, were calculated by crossing the Data – Event Matrix with the Event – Impact Matrix, as shown in the following equation:

$$[DATA-IMPACT] = \frac{1}{75} [DATA-EVENT] \times [EVENT-IMPACT] \quad (4.11)$$

10. Calculate “Data – Importance Matrix.”

Finally, the “Data – Importance Matrix” is the “Data – Impact Matrix” whose all members were divided by the maximum impact score (e.g., 1.29 of the “Details of Documents Received” data) and then multiplied by ten in order to changed the indices into the 10-scaled basis, similar to the other indices in this research. The following formula shows the mentioned process.

$$[DATA-IMPORTANCE] = \frac{10}{1.29} [DATA-IMPACT] \quad (4.12)$$

Table 4-1 Details of Matrices Created in the Claim Data Importance Analysis

Matrix	i x j	Value	Meaning of Values
1. Basic Event - Impact Matrix	50x1	$0 \leq X \leq 10$	Impact of the Basic Event to a project
2. Alarming Event - Basic Event Matrix	25x50	"0", "0.5", or "1"	"0" = The Alarming Event i seldom occurs before the Basic Event j. "0.5" = The Alarming Event i sometimes occurs before the Basic Event j. "1" = The Alarming Event i always occurs before The Basic Event j.
3. Alarming Event - Impact Matrix	25x1	$0 \leq X \leq 10$	Impact of the Alarming Event i to a project
4. Event - Impact Matrix	75x1	$0 \leq X \leq 10$	Impact of the event i, both Basic Event and Alarming Event, to a project.
5. Data - Contractual Claim Damage Matrix	105x123	"0", "0.5", or "1"	"0" = The data i is seldom required in calculation of the damages of the contractual claim component j. "0.5" = The data i is sometimes required in calculation of the damages of the contractual claim component j. "1" = The data i is always required in calculation of the damages of the contractual claim component j.
6. Contractual Claim Damage - Basic Event Matrix	123x50	"0", "0.5", or "1"	"0" = The damages of the contractual claim component i are seldom caused by the basic event j. "0.5" = The damages of the contractual claim component i are sometimes caused by the Basic Event j.

Table 4-1 Details of Matrices Created in the Claim Data Importance Analysis (Cont.)

Matrix	i x j	Value	Meaning of Values
6. Contractual Claim Damage - Basic Event Matrix (Cont.)			"1" = The damages of the contractual claim component i are always caused by the basic event j.
7. Data - Basic Event Matrix (for Contractual Claim Damage)	105x50	$0 \leq X \leq 1$	Importance of the data i, in calculation of the damages of the contractual claim components caused by the Basic Event j.
8. Data - Basic Event Matrix (for Contractual Claim Liability)	105x50	$0 \leq X \leq 1$	Importance of the data I in substantiation of the entitlement to the contractual claim components caused by the Basic Event j. (0 = Least important, 1 = Most important)
9. Data - Basic Event Matrix (for Non-contractual Claim Cost)	105x18	"0", "0.5", or "1"	<p>"0" = The data i is seldom required in calculation of the cost of the ex-contractual claim and the ex-gratia claim component j.</p> <p>"0.5" = The data i is sometimes required in calculation of the cost of the ex-contractual claim and the ex-gratia claim component j.</p> <p>"1" = The data i is always required in calculation of the cost of the ex-contractual claim and the ex-gratia claim component j.</p>

Table 4-1 Details of Matrices Created in the Claim Data Importance Analysis (Cont.)

Matrix	i x j	Value	Meaning of Values
10. Data - Basic Event Matrix (for Non- contractual Claim Time)	105x18	"0", "0.5", or "1"	"0" = The data i is seldom required in calculation of the delay of the ex-contractual claim and the ex-gratia claim component j. "0.5" = The data i is sometimes required in calculation of the delay of the ex-contractual claim and the ex-gratia claim component j. "1" = The data i is always required in calculation of the delay of the ex-contractual claim and the ex-gratia claim component j.
11. Data - Basic Event Matrix (for Non- contractual Claim Liability)	105x18	"0", "0.5", or "1"	"0" = The data i is seldom required in substantiation of the entitlement to the ex-contractual claim and the ex-gratia claim component j. "0.5" = The data i is sometimes required in substantiation of the entitlement to the ex-contractual claim and the ex-gratia claim component j. "1" = The data i is always required in substantiation of the entitlement to the ex-contractual claim and the ex-gratia claim component j.
12. Data - Basic Event Matrix (for Non- contractual Claim)	105x18	"0", "0.5", or "1"	"0" = The data i is seldom required in substantiation and calculation of the entitlement or the damages of the ex-contractual claim and the ex-gratia claim component j. "0.5" = The data i is sometimes required in substantiation and calculation of the entitlement or the damages of the ex-contractual claim and the ex-gratia claim component j.

Table 4-1 Details of Matrices Created in the Claim Data Importance Analysis (Cont.)

Matrix	i x j	Value	Meaning of Values
12. Data - Basic Event Matrix (for Non- contractual Claim)(Cont.)			“1” = The data i is always required in substantiation and calculation of the entitlement or the damages of the ex-contractual claim and the ex-gratia claim component j.
13.Data – Alarming Event Matrix	105x25	“0”, “0.5”, or “1”	“0” = The data i is seldom required in identification of the Alarming Event j. “0.5” = The data i is sometimes required in identification of the Alarming Event j. “1” = The data i is always required in identification Of the Alarming Event j.
14. Data – Event Matrix	105x75	“0”, “0.5”, or “1”	“0” = The data i is seldom required in substantiation, calculation the Basic Event j, or in identification of the Alarming Event j, as the case may be. “0.5” = The data i is sometimes required in substantiation, calculation the Basic Event j, or in identification of the Alarming Event j, as the case may be. “1” = The data i is always required in substantiation, calculation the Basic Event j, or in identification of the Alarming Event j, as the case may be.
15. Data – Impact Matrix	105x1	$0 \leq X \leq 10$	The impact of the data i to the employer’s claim management process.
16. Data - Importance Matrix	105x1	$0 \leq X \leq 10$	The importance of the data i to the employer’s claim management process.

4.2 Claim Data Importance Index

From the Claim Data Availability Indices acquired from the questionnaire survey and the Claim Data Importance Indices acquired from the last step of the Claim Data Importance Analysis, all of 105 pieces of data were classified into four groups: (1) High Importance - High Availability Data, (2) High Importance - Low Availability Data, (3) Low Importance - High Availability Data, and (4) Low Importance - Low Availability Data. Note that in separating between high values and low values, the medians were used instead of the arithmetic means because of the wide range of the data and the presence of some outliers (values that have much higher or lower values than the others). Table 4-2 shows the data with their Claim Data Importance Index and Claim Data Availability Index accordingly.

Table 4-2 Data Required in Managing the Employers' Claims

Data	I.I.	A.I.	Data	I.I.	A.I.
<i>Group A: High Importance-High Availability Data (30 Data)</i>			<i>Group B: High Importance-Low Availability Data (23 Data)</i>		
A1. Adjusted Unit Cost of Works	3.25	5.98	B1. Actual Employer's Cash Flow	1.46	5.33
A2. Date of Documents Received	4.84	6.68	B2. Bid Price of Each Contractor in Past Bidding Project	3.25	4.38
A3. Date of Documents Submitted	5.54	6.85	B3. Contractor's Cost of Capital	3.25	3.70
A4. Date of Employer's Free-Issue Material Purchase	1.46	6.10	B4. Cost Pattern of the Opportunity Profit Loss Project	3.25	4.25
A5. Date of Instructions Issued	2.38	6.50	B5. Details of Deficiency in Works	1.57	5.83
A6. Delay Duration Attributable to the Contractor	4.55	6.58	B6. Details of Works Done by the Subcontractor	3.25	4.95

Table 4-2 Data Required in Managing the Employers' Claims (Cont.)

Data	I.I.	A.I.	Data	I.I.	A.I.
A7. Details of Contract Documents	7.32	7.20	B7. Employer's Cost in the Segmented Cost Code	1.88	4.65
A8. Details of Documents Received	10.0 0	6.70	B8. Employer's Cost of Capital	1.46	4.75
A9. Details of Documents Submitted	5.19	6.53	B9. Employer's Equipment Actual Hour	1.46	5.80
A10. Details of Instruction Issued	5.61	6.58	B10. Employer's Equipment Hourly Operating Cost	1.46	5.43
A11. Employer's Free-Issue Material Return to Employer	1.46	5.95	B11. Employer's Equipment Hourly Ownership Cost	1.46	5.08
A12. Employer's Free-Issue Material Sent to the Contractor	1.46	6.38	B12. Employer's Personnel Hours of Increased Rate	1.46	5.65
A13. Employer's Free-Issue Material Unit Price	1.46	6.63	B13. Engineering Expert's Opinion	1.58	5.38
A14. Employer's Personnel Hours Used in Additional Work	1.46	6.25	B14. Estimated Payment to Other Contractors	1.46	4.43
A15. Employer's Personnel Rate	1.46	5.95	B15. Expected Interest Rate of Central Bank in Profit Loss Project Duration	3.25	4.23
A16. Interest Rate of Central Bank	3.26	6.05	B16. Original Employer's Cash Flow	1.46	5.18
A17. Normal Equipment Rental Cost	3.25	6.50	B17. Law Expert's Opinion	1.07	4.35
A18. Normal Hourly Equipment Operating Cost	3.25	6.08	B18. Law or Regulation	4.39	5.78
A19. Normal Labor Rate	3.25	7.10	B19. Normal Hourly Equipment Ownership Cost	3.25	4.93
A20. Normal Material Unit Price	3.25	6.95	B20. Normal Productivity	3.25	5.85

Table 4-2 Data Required in Managing the Employers' Claims (Cont.)

Data	I.I.	A.I.	Data	I.I.	A.I.
A21. Payment Amount	5.69	7.25	B21. Original Value of Works	1.46	5.50
A22. Payment Date	4.23	6.95	B22. Percent Overhead+Profit+Tax / Direct Cost	3.25	5.48
A23. Payment Purpose	5.69	6.55	B23. Required Rate of Return of Project	1.46	5.00
A24. Payment to Whom	5.69	6.05			
A25. Productivity Records	3.25	6.05	<i>Group D: Low Importance-Low Availability Data (29 Data)</i>		
A26. Reasons of Delays	5.07	6.33	D1. Actual Employer's Information	0.23	5.45
A27. Site Condition	4.17	6.83	D2. Advantage, Disadvantage and Limitation of the New Technology	0.09	5.48
A28. Test Result	0.99	7.25	D3. Advantage, Disadvantage and Limitation of the Original Technology	0.09	5.70
A29. Total Price of Contracts the Contractor Receive	3.25	6.93	D4. Bid Price of Each Contractor	0.12	5.65
A30. Works Done by the Contractor	3.25	7.25	D5. Cause of Deficiency in Works	0.23	5.33
			D6. Claims against the Contractor in the Former Projects	0.11	4.48
<i>Group C: Low Importance-High Availability Data (23 Data)</i>			D7. Claims against the Engineer in the Former Projects	0.11	4.65
C1. Actual Works Information	0.23	8.13	D8. Date of Change in Law or Regulation	0.09	4.60

Table 4-2 Data Required in Managing the Employers' Claims (Cont.)

Data	I.I.	A.I.	Data	I.I.	A.I.
C2. Climatic Condition	0.53	7.20	D9. Date of Visiting the Site	0.04	5.70
C3. Contractor's Information	0.34	7.10	D10. Designer's Information	0.06	4.75
C4. Contractor's Information the Employer Received	0.18	6.95	D11. Details of Change in Construction Method	0.06	5.83
C5. Date of Each Use of Works	0.05	6.08	D12. Details of Law or Regulation Changed	0.09	4.58
C6. Date of Special Events Occur	0.19	5.95	D13. Details of Special Events Occur	0.19	5.58
C7. Date that the Work can be Used as Intended	0.81	6.93	D14. Duration the Work cannot be Used as Its Purpose	0.10	5.00
C8. Each Contractor's Works Duration	0.04	7.10	D15. Expected Soil Condition	0.06	5.38
C9. Each Contractor's Works Relationship	0.04	5.93	D16. Financial Expert's Opinion	0.01	4.45
C10. Each Contractor's Works Start Date	0.04	7.20	D17. Name of Visitors	0.04	5.40
C11. Expected Climatic Condition	0.53	6.13	D18. Need of the New Technology	0.09	5.80
C12. Number of Contractor's Personnel at Site	0.10	7.58	D19. Payment Practice for Similar Works in Other Projects	0.56	5.08
C13. Number of Contractors in the Project	0.04	7.65	D20. Problem of Use of Works	0.01	5.33
C14. Problem in Performing the Works	0.01	6.33	D21. Purpose of Each Visiting the Site	0.04	5.40
C15. Purpose of Each Use of Works	0.05	6.35	D22. Received Payment Date	0.23	5.65
C16. Received Payment Amount	0.36	6.05	D23. Received Payment from Whom	0.36	5.60

Table 4-2 Data Required in Managing the Employers' Claims (Cont.)

Data	I.I.	A.I.	Data	I.I.	A.I.
C17. Site Condition of Neighborhood Sites	0.15	5.95	D24. Received Payment Purpose	0.36	5.35
C18. Soil Condition	0.06	6.75	D25. Relationship between Contractor and Designer in the Former Projects	0.03	4.05
C19. Standard	0.05	6.38	D26. Relationship between Designer and Contractor in the Project	0.03	4.43
C20. Statement the Employer Received	0.16	6.05	D27. Relationship between Employer and Third Party	0.25	4.08
C21. Works Done by the Employer	0.81	6.43	D28. Relationship between Other Contractors and Engineer in the Former Projects	0.08	4.70
C22. Works Information the Contractor Received	0.09	7.03	D29. Works Done by Other Contractors	0.11	5.68
C23. Work-style of the Engineer	0.04	6.15			

From Table 4-2, there are 30 High Importance - High Availability Data, 23 High Importance - Low Availability Data, 23 Low Importance - High Availability Data, and 29 Low Importance - Low Availability Data. The acquired results suggest the employers to which data they need to pay attention.

The data of High Importance - Low Availability Group should be paid a high level of attention. From analyzing these 23 pieces of High Importance - Low Availability data, some recommendations as to claim data collection were drawn:

1. Claim management staff should be educated and some technical consulting services may be required. Claim management process may require technical data or data acquired from external sources such as the cost patterns of the projects (for substantiating loss of opportunity claims), normal productivities, normal hourly

equipment costs, engineering expert's opinions, law expert's opinions, and laws & regulations.

2. Data from the cost control process are necessary for claim management process. The management must establish and maintain effective cost control systems in their organizations. The cost control data that are necessary in claim management process are original employer's cash flows, actual employer's cash flows, estimated payments to the contractors, and employer's records of payments.

3. The construction supervision shall be performed seriously and continuously. The important data such as deficiencies in works, numbers of the contractor's personnel at site, and progress of works done have to be well recorded. These data have great advantages in claim management.

4. The cooperation between the construction management staff and other staff from other departments in employers' organizations, especially financial management staff, shall be supported. There are several claim data that are related to financial management: the employer's cost of capital, required project rate of return, and expected interest rate.

5. In the case that the employer has his own equipment, the efficient equipment management practices should be implemented. The records of equipment usage and costs should be continuously performed. The actual equipment hour, hourly operating cost, as well as hourly ownership cost of equipment shall be able to find out.

6. Some contractors' data are important in claim management but difficult to be accessed by the employers. They are bid prices in past bidding projects (for substantiating loss of opportunity claims), and contractor's cost of capital (for substantiating contractor's claims for financial costs or interests). The contractor's cost of capital can be collected by requiring contractors to submit when bidding for projects or stating the predetermined rate in contracts while the historical bidding data should be collected for the employers who have continuous works such as the public authorities.

7. Contract documents should be available for claim management staff. Some data such as percent mark-ups and original contract prices quoted by contractors are important for analysis of some claim components such as head office overhead and cost of completion.

There are three main advantages of the Claim Data Importance Analysis procedure described in this Chapter, as follows:

1. The analysis considered several factors that have significant effects on projects such as impact of the events leading to the rights to claim, relationships between the Alarming Events and the events leading to the rights to claim, importance of the claim data in analyzing each claim component, and the claim components caused by each events.

2. The data collected from the respondents were reliable because the respondents could understand and reply the questions more clearly. They were asked to assess frequency and severity of each claim event separately. The relationships between claim data and impact of their absence are too complex and need too much analysis time to be collected by a questionnaire survey.

3. The indices derived from this method have wide range of values, as seen from Table 4-2. This advantage helps claim managers identify the relative importance among claim data clearly and correctly.

Finally, the results of this analysis, the Claim Data Importance Indices of the claim data, can be used in the following phases of this research such as Claim Document Analysis and designing of the proposed claim management system, as discussed in Chapters 5 [Claim Document Importance Index] and 7 [Proposed Construction Claim Management System] respectively.

4.3 Summary

In this chapter, details of the Claim Data Importance Analysis were presented. This analysis aimed at finding the level of importance of the claim data in terms of the "Claim Data Importance Indices". Because of a large amount of data, events, and components, the calculations were performed in the form of matrices. The claim data collected from Claim Data Requirement Analysis, as well as the Claim Event Frequency Index, the Claim Event Severity Index of each claim-leading event, and the Claim Data Availability Index of each claim data acquired from the questionnaire survey were used as inputs of the analysis.

It was found that 105 pieces of data identified in the Claim Data Requirement Analysis phase can be classified by their Importance Indices and Availability Indices, into four categories: (1) thirty pieces of “High Importance - High Availability Data”, (2) 23 pieces of “High Importance - Low Availability Data”, (3) 23 pieces of “Low Importance - High Availability Data”, and (4) 29 pieces of “Low Importance - Low Availability Data.” The data with high importance but low availability should be given special attention by the employers.

Considering of “High Importance - Low Availability Data” claim data, some recommendations were drawn. They were:

1. Claim management staff should be educated and some technical consulting services may be required.
2. Effective cost control systems have to be established and maintained in organizations.
3. The important data such as deficiencies in works, numbers of the contractor’s personnel at site, and progress of works done have to be well recorded.
4. The cooperation between the construction management staff and other staff from other departments in employers’ organizations, especially financial management staff, shall be supported.
5. Records of equipment usage and costs should be continuously performed.
6. Employers can collect some important claim data from contractors by several means such as by requiring contractors to submit when bidding for projects or by continuously collecting contractors’ profiles. Alternatively, employers may specify some data in contracts to avoid the difficulties and conflicts in data collection.
7. Contract documents should be available for claim management staff.

The Claim Data Importance Analysis converted Claim Event Impact Index of each event entitling the rights to claim (in the form of Basic Event – Impact Matrix) to Claim Data Importance Index of each claim data (in the form of Data – Importance Matrix) by taking account of several relationships: data – claim damage relationship, claim damage – event relationship, data – event relationship, and Alarming Event – event relationship. The approach used for finding a level of importance of each claim

data had several advantages. Three main advantages consisted of taking account of all important factors, using high validity inputs (questionnaire results), and high classification ability. In addition, the derived Claim Data Importance Indices were used in the following phases of the research. In the next chapter, the Claim Data Importance Indices of 105 pieces of claim data were used as inputs in analyzing the importance of the documents flowing in construction projects. In Chapter 7 [Proposed Construction Claim Management System], they were used as design information in designing the proposed claim management system.



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER V

CLAIM DOCUMENT IMPORTANCE ANALYSIS

After acquiring the importance of each claim data, the importance of the documents that contain the claim data and the availability of the claim data in a project were the two next questions needed to be answered. The Claim Document Importance Analysis aimed at analyzing the availability of the claim data, missing data, level of importance of each document in claim management purposes, and guidelines for improving the system by examining all documents flowing in the representative project. A representative project was a project that was established in order to be a representative of real-world projects. The reason for this establishment was the need to confine the variability of contract provisions of the international construction projects so that they can be analyzed systematically. In this research, the representative project was set to be a large-sized international construction project which adopts the *Conditions of Contract for Construction (1999)* as the employer-contractor agreement, the *Client / Consultant Model Services Agreement (1998)* as the employer-engineer agreement, and the International Chamber of Commerce's Rules of Arbitration (ICC's Rules of Arbitration) as the dispute resolution procedure. Finally, the results acquired were used in designing the proposed claim management system, the following phase of the research.

5.1 Description

This phase aimed at analyzing the communication processes among parties in international construction projects in order to find the availability of important data required in the employer's claim management processes, guidelines to improve the efficiency of the processes, and the level of importance of each document flowing in the process. The analysis was performed in the following steps:

1. Analyze the provisions concerning communication among parties in an international construction contract.

The related provisions consist of those contained in the employer-contractor contract, employer - engineer agreement, and rules of arbitration. In order to establish a representative model of international construction contract management procedures, the “*Conditions of Contract for Construction (First Edition)*” and the “*Client / Consultant Model Services Agreement (Third Edition)*” prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) and International Chamber of Commerce’s Rules of Arbitration (ICC’s Rules of Arbitration) were selected (FIDIC, 1998, 1999; Craig et al, 1990). The list of all documents flowing in the process, accompanied by their reference clause, issuer, and receiver, was created and used in the subsequent steps.

2. Group documents by their purposes and contents.

In order to facilitate analysis, documents with similar purposes and contents were grouped together. For example, the FIDIC construction contract agreement and the FIDIC Client / Consultant agreement are in the same group because both contain the parties’ intention to have a contractual relationship with the other. A list of all groups of documents can be found in Appendix B.

3. Analyze the availability of each piece of claim data in the representative project and the additional documents need to be added to the project.

The availability of the 105 pieces of data necessary for claim management, proposed in Chapter 4 [Claim Data Importance Analysis], was inspected. In addition, the missing data from all mandatory documents were listed and the relevant additional documents needed to be added to the system were analyzed by considering other documents flowing in existing construction project. Details of the numbers of the documents in each group are shown in Figure 5-3 while missing data and the recommended additional documents are in Section 5.2.3 [Recommended Additional Documents].

4. Finding the importance of the documents by calculating “Claim Document Importance Index” of each document and analyzing the claim filing procedures stated in the *Conditions of Contract for Construction (First Edition)*.

The Document Importance Index of each document was calculated by summing all “Data Importance Indices” of all claim data contained in the document. The higher Document Importance Index, the higher importance the document is in construction

claim management processes. The documents stated in the claim provisions of the standard contract were viewed as the high importance documents.

5.2 Documents Necessary to Claim Management

5.2.1 Documents Flowing in the Claim Filing Procedures

According to the *Conditions of Contract for Construction (First Edition)*, the procedure that employers shall follow in filing claims against their contractors is different from the contractors' claim procedure. Figure 5-1 shows the employer's claim filing procedure while Figure 5-2 shows the contractor's procedure.

In this form of contract, not only the contractor can claim for time extension, but the employer can also claim against the contractor requesting time extension. Sub-clause 11.3 [Extension of Defects Notification Period] states that the employer shall be entitled to an extension of the Defects Notification Period for the works or a section if the work or section (as the case may be) cannot be used for the purpose for which they are intended by reason of a defect and damage, after taking over.

The claim process begins when the employer considers himself to be entitled to any payment or any extension of the Defects Notification Period. According to Sub-clause 2.5 [Employer's Claims], the employer or the Engineer, shall give notices and particulars to the contractor as soon as practical. This notice requirement provision is extremely important. The claimant will be viewed as waiving the rights to claim if he breaches such rule. However, notice is not required for payments due under some provisions such as 4.19 [Electricity, Water and Gas], Sub-clause 4.20 [Employer's Equipment and Free-Issue Material], and for other services requested by the contractor. In addition, the notice of claim notification for an extension of Defects Notification Period shall be sent to the contractor before the expiry of such period.

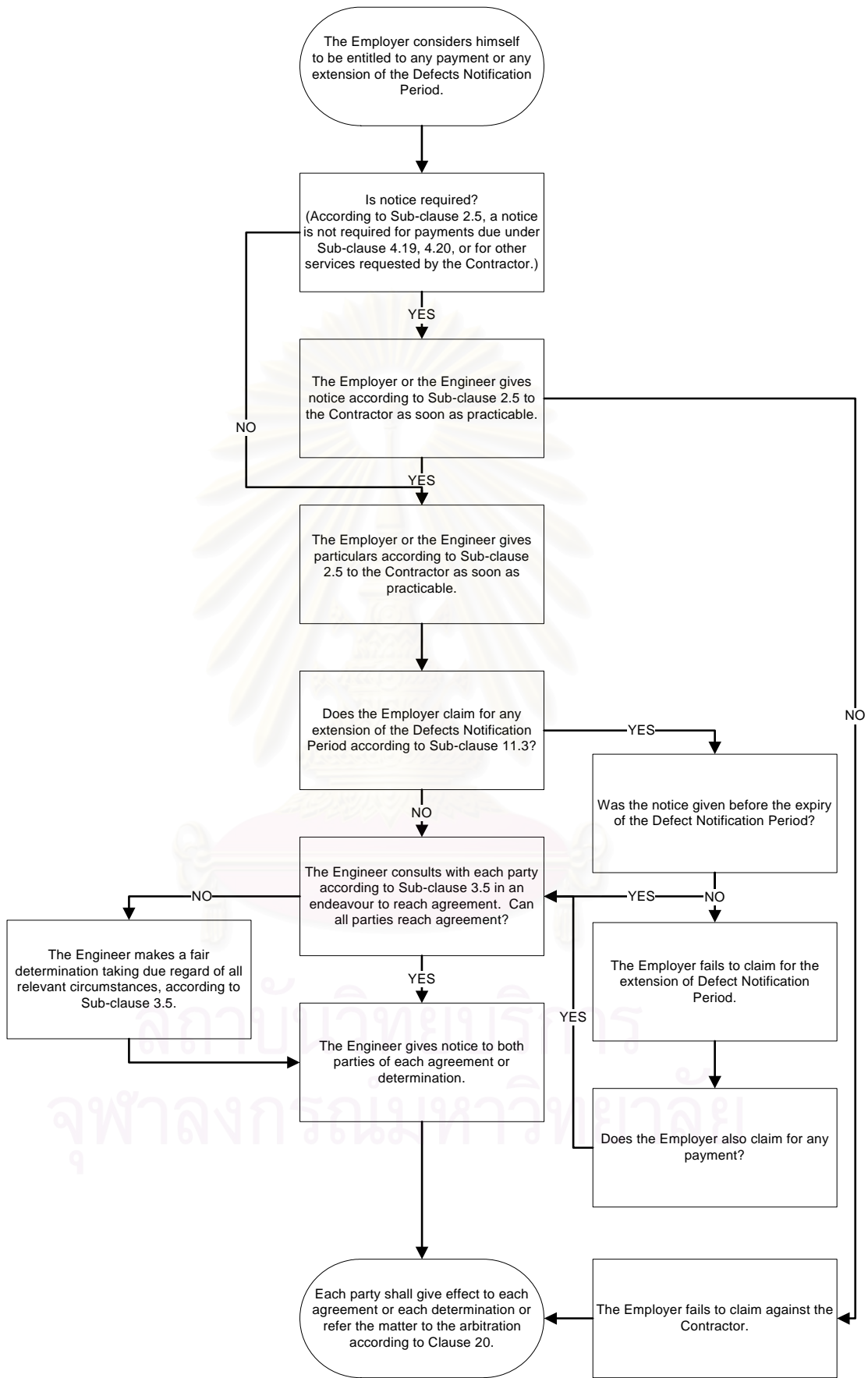


Figure 5-1 The Employer's Claim Procedure of The Construction Contract (1999)

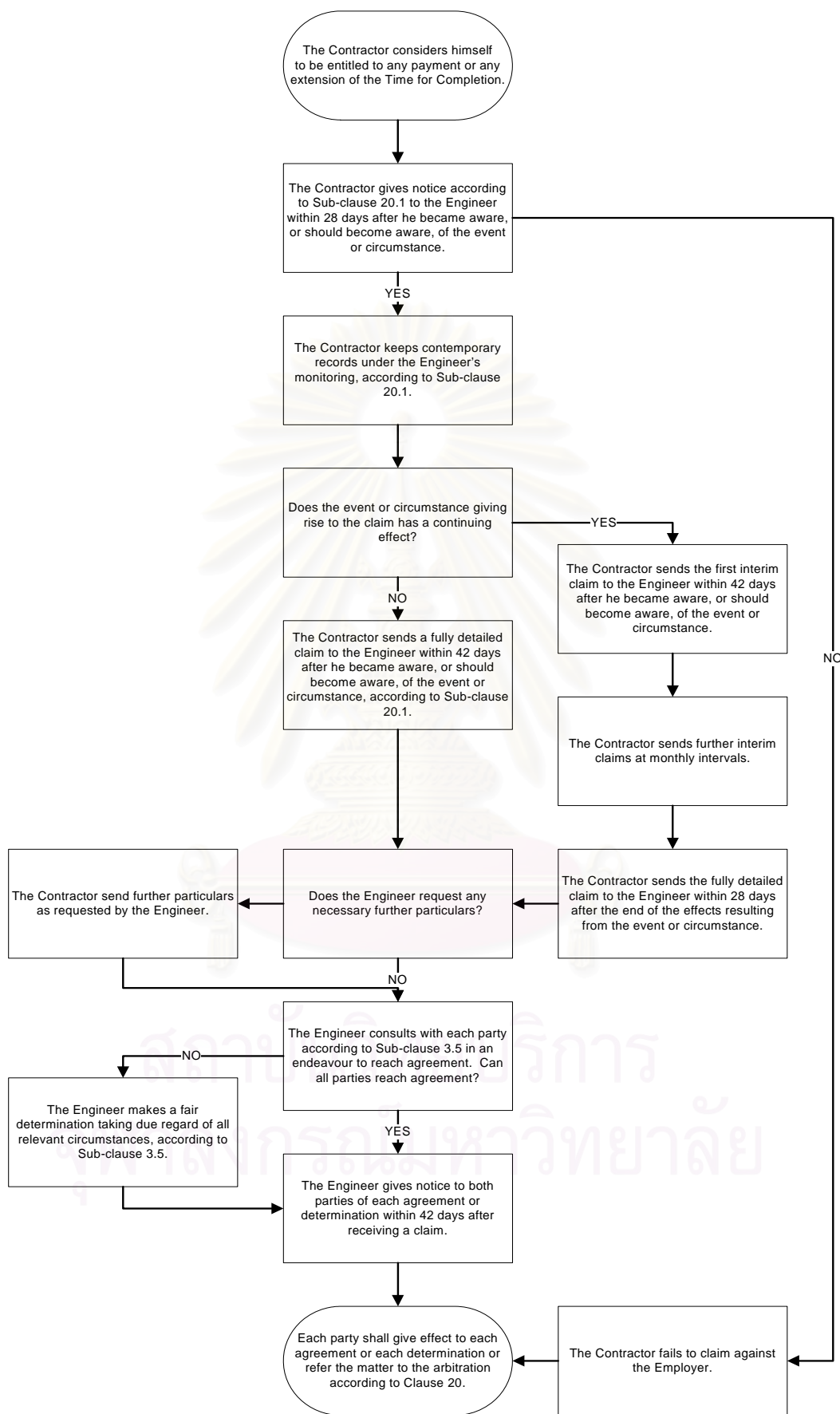


Figure 5-2 The Contractor's Claim Procedure of The Construction Contract (1999)

The claim proposal shall specify the provision or other basis of the claim, substantiation of the amount or the extension. Then, the engineer shall consult with each party in an endeavor to reach agreement according to Sub-clause 3.5 [Determinations]. However, if agreement is not achieved, the engineer shall make a fair determination in accordance with the contract and taking due regard of all relevant circumstances. After agreement or determination, the engineer shall give notice to both parties with the results of agreement or determination (as the case may be) with supporting particulars. Each party has to give effect to each agreement or determination unless it is revised by arbitrator's decision according to Sub-clause 20 [Claims, Disputes and Arbitration] (FIDIC, 1999).

Compared to the employer's claim management procedure, the procedure that the contractor has to follow has some differences. Sub-clause 20.1 [Contractor's Claims] states the time limit of the contractor's responsibility to send notice to the engineer as 28 days after the contractor became aware or should have become aware of claim occurrence. After that, the contractor shall keep contemporary records. The engineer may monitor the record-keeping process and instruct the contractor to keep further records.

The contractor shall submit a fully detailed claim which includes full supporting particulars of the basis of claim and of the extension of time or additional payment claimed within 42 days after the contractor's awareness of the claim event. In case the event or circumstance has a continuing effect, the contractor shall submit the first monthly interim claim on the mentioned time limit and the last claims within 28 days after the end of the effects resulting from the event or circumstance.

After receiving a claim or any further particulars supporting a previous claim, the engineer shall consult with each party, make a fair determination, and respond with approval or disapproval and detailed comments within 42 days. The engineer may request any necessary further particulars from the contractor. However, he shall give the response to the claim within 42 days. (FIDIC, 1999)

From the employer's and contractor's claim procedures discussed above, the documents that are necessary to file claims are comprised of (1) notice of claim notification, (2) claim proposal, and (3) notice of claim agreement or determination.

These documents should be paid a high level of attention. The notice requirement shall be strictly complied; otherwise the claimant will lose the rights to claim. Claim proposals shall contain all necessary information such as the bases giving rise to the claims, substantiation of the amounts and extensions claimed. Finally, notices of claim agreements or determinations may be used as evidence in the dispute resolution process.

5.2.2 Documents Flowing in the Representative Project

From the analysis, there are 352 documents specified by the FIDIC's agreements and ICC's rules of arbitration, which can be placed into 181 groups of documents. Most of them are submitted to or received by the employer or the engineer except six groups of documents (eight total documents). In these groups of documents, 143 groups (264 documents) contain necessary claim data. Full lists of all groups of documents are shown in Appendix B. Figure 5-3 shows the numbers of document groups with claim data of each standard document.

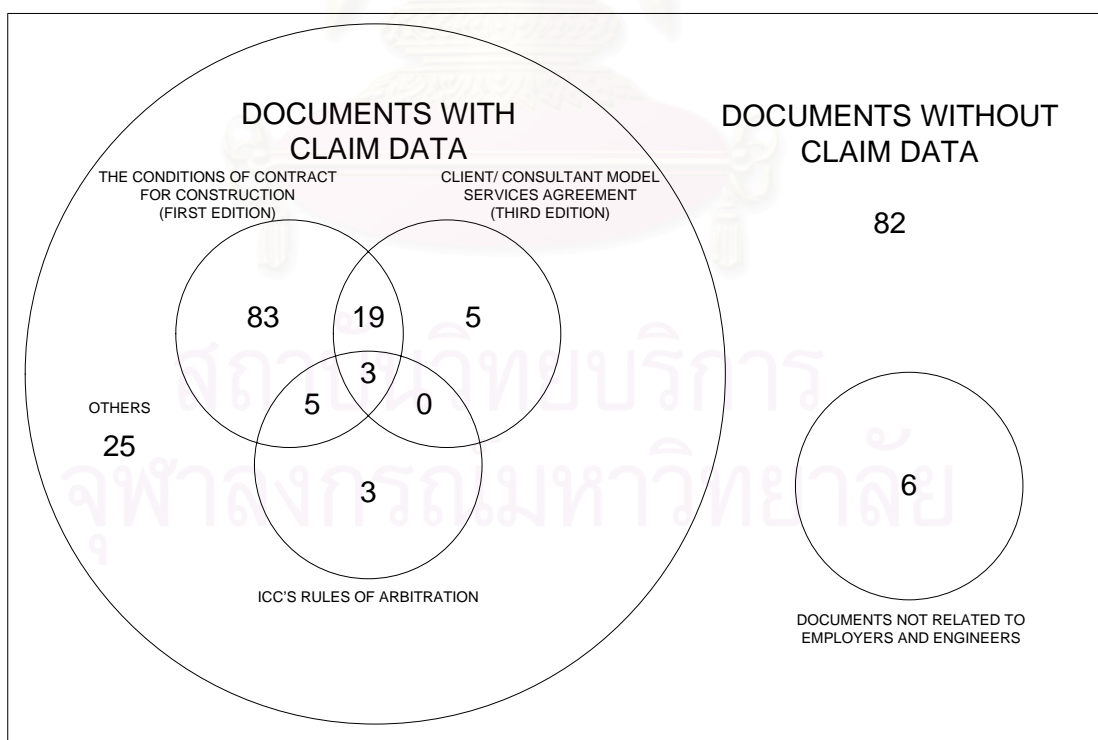


Figure 5-3 Numbers of the Document Groups in the Representative Project

Checking the availability of the claim data, there are eighteen pieces of claim data missing from the mandatory documents of the representative project, as shown in Table 5-1. This data can be categorized into six groups by their contents: Expert's Opinion, Equipment, Financial, Relationship, Employer's Use of Works, and Site Visitor. Without the claim data listed in Table 5-1, the employers cannot perform correct and complete analysis of construction claim liabilities and claim quantum.

Table 5-1 Claim Data Missing from the Representative Project

Group	Claim Data
1. Expert's Opinion	a. Engineering Expert's Opinion b. Financial Expert's Opinion
2. Equipment	a. Hourly Employer's Equipment Operating Cost b. Hourly Employer's Equipment Ownership Cost
3. Financial	a. Contractor's Cost of Capital b. Employer's Cost in the Segmented Cost Code c. Original Employer's Cash Flow d. Actual Employer's Cash Flow e. Employer's Cost of Capital f. Required Project Rate of Return
4. Relationship	a. Relationship between Employer and Third Party b. Relationships among Each Contractor's Works c. Relationship between Designer and Contractor in the Project
5. Employer's Use of Works	a. Date of Each Use of Works b. Purpose of Each Use of Works
6. Visitor	a. Date of Site Visit b. Name of Visitors c. Purpose of Each Site Visit

The opinions of the engineering experts are very important. In construction claim management, there are several determinations that need special skills such as

determination of claims for the differing site conditions and time extension. The providing of employer's equipment is seldom found in the industry. However, if the employer agrees to supply the contractor equipment, documents required in calculating hourly equipment ownership and operating costs shall be well collected. Some of the financial data such as the employer's original and actual cash flows, the employer's and contractor's costs of capital, and the required rate of return were missed. The relationships between parties such as the employer – third party and designer – contractor are not usually recorded. However, these data are useful to identify claims that occur or might occur. The date and purpose of the employer's uses of works should be recorded in case of the contractor's claim against him for these events. The last group, visitor's data, these data are helpful in claim identification. Visiting by the lawyer or legal staff is one sign of claims (Adrian, 1988).

5.2.3 Recommended Additional Documents

In order to acquire the mentioned missing claim data, a number of additional documents have to be added to the representative project. These documents were collected by analyzing the documents flowing between parties in every process of the existing construction projects. Figure 5-4 shows the documents flowing in existing construction projects in form of a modified Data Flow Diagram (DFD) (Dennis and Wixom, 2000). In this modified DFD, the documents flowing in between entities were shown in stead of the data. It was found that there were a large number of documents shown in the figure, making it too complex. Figure 5-5 shows the simplified modified DFD that is easier to interpret the results. The simplified modified DFD was derived from grouping all documents (arrows) with the same original and destination into one arrow.

There are several parties concerned in a construction project; they are the employer, contractor, engineer, designer, other consultant, supplier, surety, insurer, and public authority. As to the relevant sub-processes, there are twelve sub-processes contained in a construction project: (1) preliminary study, (2) designing, (3) financing, (4) procurement, (5) supervision, (6) payment, (7) variation ordering, (8) claiming, (9) dispute resolution, (10) taking-over, (11) warranty, and (12) termination.

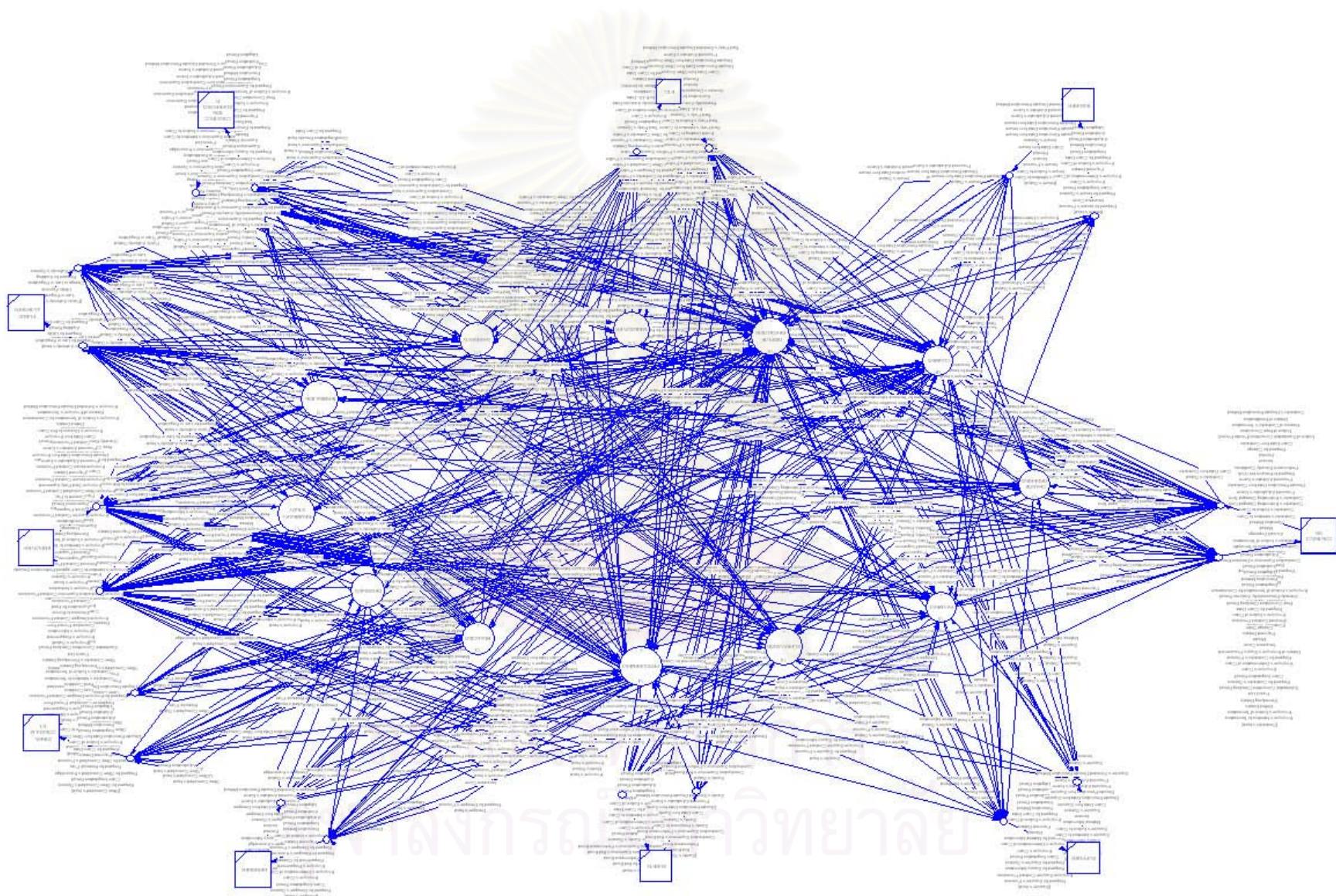


Figure 5-4 Complexity of the Data Flowing in the Existing System

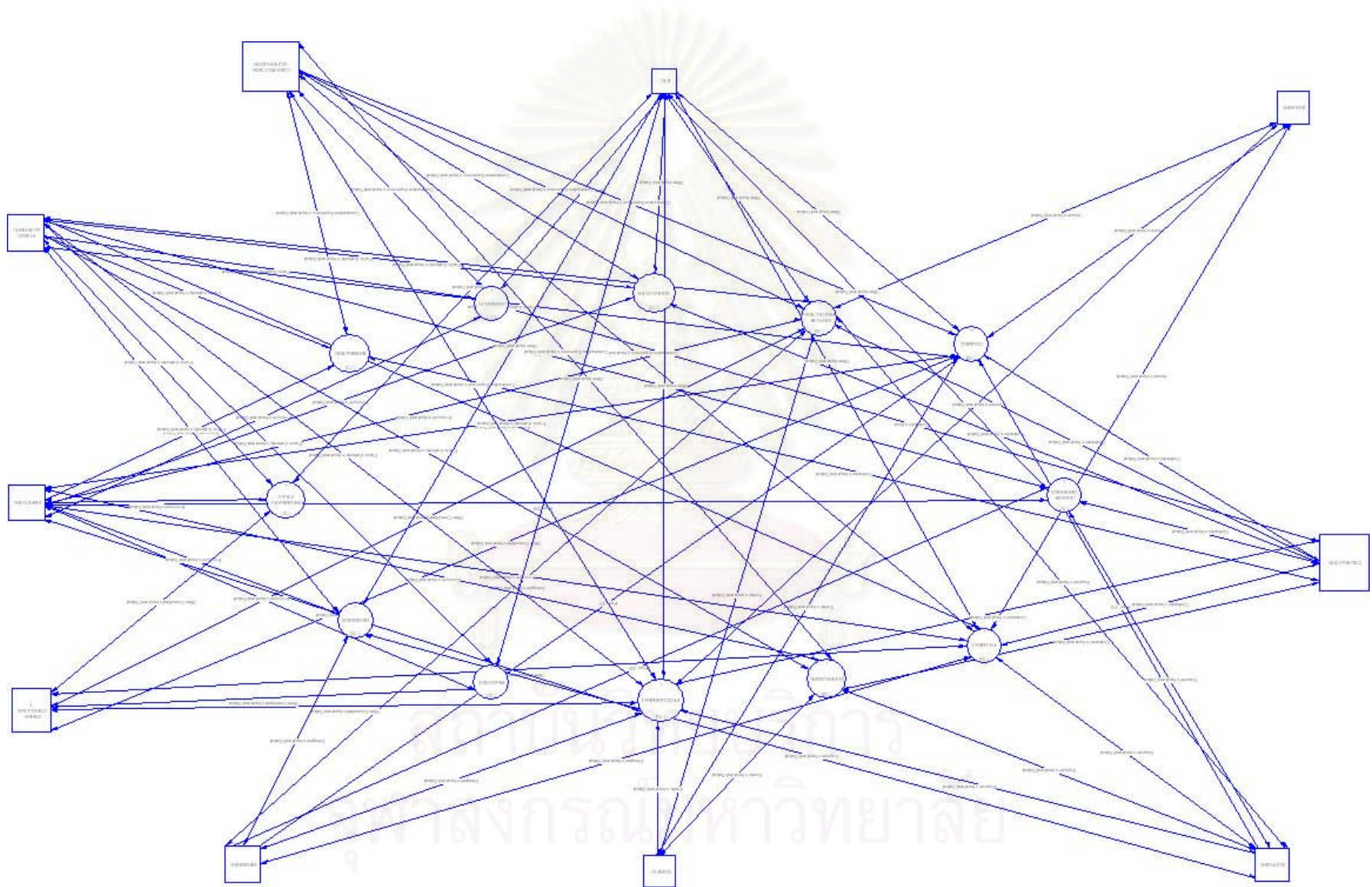


Figure 5-5 Data Flowing in the Existing System (Simplified)

Table 5-2 Analysis of Recommended Additional Documents

No.	Additional Document	Missing Claim Data Number																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	1) Consultant's Monthly Report or 2) Consultant's Weekly Report											✓			✓	✓	✓	✓	✓
2.	Site Diary											✓			✓	✓	✓	✓	✓
3.	Minutes of Meetings											✓		✓	✓	✓			
4.	Request for Expert's Opinion																		
5.	1) Notice of Expert's Opinion or 2) Report of Expert	✓	✓	✓	✓														
6.	Record of Equipment Cost from Employer			✓	✓														
7.	Employer's Equipment Identification Card																		
Remarks:																			
Data Number: 1) Engineering Expert's Opinion, 2) Financial Expert's Opinion, 3) Hourly Employer's Equipment Operating Cost, 4) Hourly Employer's Equipment Ownership Cost, 5) Contractor's Cost of Capital, 6) Employer's Cost in the Segmented Cost Code, 7) Original Employer's Cash Flow, 8) Actual Employer's Cash Flow, 9) Employer's Cost of Capital, 10) Required Project Rate of Return, 11) Relationship between Employer and Third Party, 12) Relationships among Each Contractor's Works, 13) Relationship between Designer and Contractor in the Project, 14) Date of Each Use of Works, 15) Purpose of Each Use of Works, 16) Date of Site Visit, 17) Name of Visitors, and 18) Purpose of Each Site Visit																			

Table 5-2 Analysis of Recommended Additional Documents (Cont.)

No.	Additional Document	Missing Claim Data Number																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
8.	Employer's Equipment Utilization Report																		
9.	Daily Employer's Equipment Time Report																		
10.	1) Record of Employer's Financial Transaction or 2) Financial Report						✓		✓	✓									
11.	Feasibility Report							✓			✓								
12.	Tender Documents of Other Tenderers																		
13.	Tender Documents in Past Bidding Project																		
14.	Employer's Financial Plan							✓			✓								
15.	Project's Master Schedule												✓	✓	✓				

Remarks:

Data Number: 1) Engineering Expert's Opinion, 2) Financial Expert's Opinion, 3) Hourly Employer's Equipment Operating Cost, 4) Hourly Employer's Equipment Ownership Cost, 5) Contractor's Cost of Capital, 6) Employer's Cost in the Segmented Cost Code, 7) Original Employer's Cash Flow, 8) Actual Employer's Cash Flow, 9) Employer's Cost of Capital, 10) Required Project Rate of Return, 11) Relationship between Employer and Third Party, 12) Relationships among Each Contractor's Works, 13) Relationship between Designer and Contractor in the Project, 14) Date of Each Use of Works, 15) Purpose of Each Use of Works, 16) Date of Site Visit, 17) Name of Visitors, and 18) Purpose of Each Site Visit

Table 5-2 Analysis of Recommended Additional Documents (Cont.)

No.	Additional Document	Missing Claim Data Number																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
16.	Notice of Contractor's Cost of Capital (in Letter of Tender)					✓													
17.	Employer's Personnel Report																		
18.	Employer's Personnel Hour Report																		
19.	Notice for Use of Works by Employer													✓	✓				
20.	Report of Site Visitor																✓	✓	✓
21.	Received Document Log																		
22.	Submitted Document Log																		
23.	Contractor's Daily Report																✓	✓	✓
24.	Contractor's Weekly Report																✓	✓	✓
25.	Contractor's Daily Request																		
Remarks:		Data Number: 1) Engineering Expert's Opinion, 2) Financial Expert's Opinion, 3) Hourly Employer's Equipment Operating Cost, 4) Hourly Employer's Equipment Ownership Cost, 5) Contractor's Cost of Capital, 6) Employer's Cost in the Segmented Cost Code, 7) Original Employer's Cash Flow, 8) Actual Employer's Cash Flow, 9) Employer's Cost of Capital, 10) Required Project Rate of Return, 11) Relationship between Employer and Third Party, 12) Relationships among Each Contractor's Works, 13) Relationship between Designer and Contractor in the Project, 14) Date of Each Use of Works, 15) Purpose of Each Use of Works, 16) Date of Site Visit, 17) Name of Visitors, and 18) Purpose of Each Site Visit																	

The documents shown in Figure 5-4 and Figure 5-5 were used in finding the additional documents need to be added into the representative project in order to make all 105 claim data available. There were 25 groups of documents that, though they are not clearly stated in the FIDIC's standard contracts and ICC's rules of arbitration, they are usually used in the construction projects, among departments in employers' organizations or between parties. Table 5-2 lists of these documents and shows the results of the analysis of the availability of eighteen missing claim data in these documents.

It was found that, in order to acquire the mentioned missing claim data, an additional fourteen groups of documents (eighteen documents) should be included in the project documents. Table 5-3 summarizes the additional documents accompanied by their relevant missing claim data.

Table 5-3 Recommended Additional Documents

No.	Group	Claim Data Missed from Mandatory Documents
1.	a. Consultant's Monthly Report b. Consultant's Weekly Report c. Consultant's Daily Report	a. Relationship between Employer and Third Party b. Date of Each Use of Works c. Purpose of Each Use of Works d. Date of Site Visit e. Name of Visitors f. Purpose of Each Site Visit
2.	Site Diary	a. Relationship between Employer and Third Party b. Date of Each Use of Works c. Purpose of Each Use of Works d. Date of Site Visit e. Name of Visitors f. Purpose of Each Site Visit

Table 5-3 Recommended Additional Documents (Cont.)

No.	Group	Claim Data Missing from Mandatory Documents
3.	Minutes of Meetings	a. Relationship between Employer and Third Party b. Date of Each Use of Works c. Purpose of Each Use of Works d. Relationship between Designer and Contractor in the Project
4.	a. Notice of Expert's Opinion b. Report of Expert	a. Engineering Expert's Opinion b. Financial Expert's Opinion
5.	Record of Equipment Cost from Employer	a. Hourly Employer's Equipment Operating Cost b. Hourly Employer's Equipment Ownership Cost
6.	a. Record of Employer's Financial Transaction b. Financial Report	a. Employer's Cost in the Segmented Cost Code b. Actual Employer's Cash Flow c. Employer's Cost of Capital
7.	Feasibility Report	a. Original Employer's Cash Flow b. Required Project Rate of Return
8.	Employer's Financial Plan	a. Original Employer's Cash Flow b. Required Project Rate of Return
9.	Notice of Contractor's Cost of Capital	Contractor's Cost of Capital
10.	Notice for Use of Works by Employer	a. Date of Each Use of Works b. Purpose of Each Use of Works
11.	Report of Site Visitor	a. Date of Site Visit b. Name of Visitors c. Purpose of Each Site Visit
12.	Project's Master Schedule	Relationships among Each Contractor's Works

Table 5-3 Recommended Additional Documents (Cont.)

No.	Group	Claim Data Missing from Mandatory Documents
13.	Contractor's Daily Report	a. Date of Site Visit b. Name of Visitors c. Purpose of Each Site Visit
14.	Contractor's Weekly Report	a. Date of Site Visit b. Name of Visitors c. Purpose of Each Site Visit

Some of the recommended documents are normally available to employers or their engineers such as consultants' reports, records of the employer's equipment cost, project's master schedule, and feasibility reports, while some documents have to be based on the contractor's notices or reports such as the contractor's daily or weekly reports, and details of each site visit by external persons. In order to acquire these documents completely, employers and engineers have to establish efficient and clear reporting systems. The written communication shall be required and engineers shall review the documents submitted from contractors deliberately.

Some documents such as notices of expert's opinion are available only in the special occasion. These documents also needed to be in written. The contractor's cost of capital is a piece of data that is very difficult to collect. It can be collected by requesting contractors to notify the data when bidding for projects or by making agreement with contractors to state the agreed rate in the contract. The advantages of the second approach are that (1) employers and engineers do not need to check the cost of capital notified by contractors, which is difficult to check, and (2) some contractors may prefer to this approach because they do not want to reveal their business strategic information.

If all mandatory documents, according to the FIDIC's standard contracts and ICC's rules of arbitration, and all of these additional documents were available, employers can be assured that they receive all data necessary to identify, analysis, prepare, and negotiate construction claims occurring in the project efficiently.

5.3 Claim Document Importance Index

The Claim Document Importance Index indicates how important a document is for claim management purposes. In addition, employers can improve their claim documentation sub-process by paying high level of attention to the documents with high Claim Document Importance Indices. It can be calculated by summing all the Data Importance Indices of all the claim data contained in the document.

Ranking all documents in the representative project by their Claim Document Importance Index, there were 83 groups (164 documents) with high importance, 60 groups (100 documents) with medium importance, and 83 groups (121 documents) with low importance, respectively. Note that all documents were first divided into three groups by using 33.33th percentile and 66.67th percentile as the dividing points. However, the lower dividing point was adjusted in order to group all documents with no claim data in the same group, the low importance group. A list of the documents in each group can be found in Appendix B. Note that all of the three documents that are necessary to file claims are comprised of (1) notices of claim notification, (2) claim proposals, and (3) notices of claim agreement or determination, discuss in Section 5.2.1 [Documents Flowing in the Claim Filing Procedures] were in the high importance group. Table 5-4 shows the top ten documents with the highest Claim Document Importance Index.

Table 5-4 Ten Documents with the Highest Document Importance Indices

Rank	Group	Reference Clause/ Sub-clause*	Document Importance Index
1	a. Consultant's Monthly Report b. Consultant's Weekly Report c. Consultant's Daily Report	N.A.	56.96
2	Minutes of Meetings	N.A.	47.23
3	a. Statement at Completion	a. G.C.14.10[Statement at Completion]	35.55

Table 5-4 Ten Documents with the Highest Document Importance Indices (Cont.)

Rank	Group	Reference Clause/ Sub-clause*	Document Importance Index
3 (Cont.)	b. Drafted Final Statement c. Final Statement	b. G.C.14.11[Application for Final Completion Certificate] c. G.C.14.11[Application for Final Completion Certificate]	35.55
4	a. Notice of Expert's Opinion b. Report from Expert	N.A.	34.99
5	a. Notice of Dispute Information to DAB), Designated Representative, Mediator, Arbitrator b. Request for Decision or Opinion from DAB, Designated Representative, Mediator, Arbitrator c. Request for Arbitration d. Notice of Answer of Request for Arbitration	a. G.C.20.4[Obtaining Dispute Adjudication Board's Decision] C.A.8[Decisions] C.A.43[Amicable Dispute Resolution] b. G.C.20.4[Obtaining Dispute Adjudication Board's Decision] C.A.8[Decisions] C.A.43[Amicable Dispute Resolution] c. G.C.20.6[Arbitration] I.C.3[Request for Arbitration] d. I.C.4[Answer to the Request]	34.38

Table 5-4 Ten Documents with the Highest Document Importance Indices (Cont.)

Rank	Group	Reference Clause/ Sub-clause*	Document Importance Index
5 (Cont.)	e. Notice to Make Counter-claim f. Notice to Reply Counter-claim	e. I.C.5[Counter-claim] f. I.C.5[Counter-claim]	34.38
6	a. Notice of Claim Notification b. Notice of Monthly Claim Details c. Notice of Final Claim Details d. Notice of Claim for Intellectual and Industrial Property Right e. Notice of Delay Caused by Employer or Contractor	a. G.C.2.5[Employer's Claim] G.C.20.1[Contractor's Claim] C.A.18[Limit of Compensation and Indemnity] b. G.C.20.1[Contractor's Claim] c. G.C.20.1[Contractor's Claim] d. G.C.17.5[Intellectual and Industrial Property Rights] e. C.A.25[Delays]	32.15
7	a. Notice of DAB's Decision or Opinion b. Notice of Arbitrator's Award c. Notice of Designated Representative's Decision d. Report of Decision of Minority of DAB	a. G.C.20.4[Obtaining Dispute Adjudication Board's Decision] b. G.C.20.6[Arbitration] C.A.44[Arbitration] c. C.A.43[Amicable Dispute Resolution] d. G.C.20.4[Obtaining Dispute Adjudication Board's Decision]	31.62

Table 5-4 Ten Documents with the Highest Document Importance Indices (Cont.)

Rank	Group	Reference Clause/ Sub-clause*	Document Importance Index
7 (Cont.)	e. Notice of Employer's Decision f. Notice of Recommendation or Non-binding Opinion by Mediator g. Record of Fact Agreed in Mediation h. Notice of Award by Consent i. Drafted Award j. Notice of the Court of Arbitration's Decision k. Notice of Chairman of the Court of Arbitration's Urgent Decision	e. C.A.8[Decisions] f. C.A.43[Amicable Dispute Resolution] g. C.A.43[Amicable Dispute Resolution] h. I.C.17[Award by Consent] i. I.C.21[Scrutiny of Award by the Court] j. I.C.23[Notification of Award to Parties] k. I.C.1[Court of Arbitration]	
8	Site Diary	N.A.	31.06
9	Notice of Claim Determination	G.C.2.5[Employer's Claim] G.C.20.1[Contractor's Claim]	30.92
10	a. Record of Employer's Financial Transaction b. Financial Report	N.A.	30.49

- * G.C. = FIDIC's *Conditions of Contract for Construction* (FIDIC, 1999)
C.A. = FIDIC's *Client / Consultant Model Services Agreement* (FIDIC, 1998)
I.C. = ICC's *Rules of Arbitration* (Craig et al, 1990)

Table 5-4 reveals the Claim Documents Importance Indices of the reports prepared by experts or consultants, minutes of meetings, statements, site diaries, and financial reports. The documents flowing in claim processes and dispute resolution

processes tend to contain the information necessary for proving the rights and responsibilities of parties. This fact can be supported by the high indices of the documents used in these processes. The high and medium importance documents should be closely controlled by the employers and the engineers because they contain the data necessary for claim management purpose.

The reports submitted from construction supervision consultants contain several important claim data such as details of received documents, payments, issued instructions, delays, site and climatic conditions, work done by the contractor and subcontractors, productivity, deficiencies in works, staff or materials or equipment supplied by the employer, work done by the employer, special events that occurred in the site, contractor's performance in site, etc. These reports are extremely important in analysis of claims against contractors as well as proving claims filed by contractors. Employers should check the reports from their consultants whether these data were reported correctly and completely or not.

Minutes of meetings are also one of the most important documents in projects. The project meetings are periodically held in order to monitor the work progress and settle problems that occurred in the project. Topics normally discussed and recorded in the minutes of meetings are comprised of details of the received or submitted documents, payments, instructions, delays, work done, productivity, deficiency in works, employer-supplied staff or materials or equipment or services, relationships, special events, site conditions, and etc. Normally, engineers will hold such meetings and submit minutes to participants after the meetings.

From the *Conditions of Contract for Construction (First Edition)*, some statements shall be issued by the contractor in order to notify the payment status of the project according to the contractor's perspective. These statements consist of Statement at Completion and Final Statement. The Statement at Completion is the statement prepared and issued by the contractor according to Sub-clause 14.10 [Statement at Completion] within 84 days after receiving the Taking-Over Certificate for the works, in order to show (1) the value of all work done up to date stated in the Taking-Over Certificate, (2) any further sums which the contractor considers to be due, and (3) an estimate of any other amounts which the contractor considers will become due to

him. On the other hand, the drafted Final Statement shall be submitted to the engineer within 56 days after receiving the Performance Certificate. This drafted statement shows (1) the value of all work done and (2) any further sums which the contractor considers to be due. After the contractor and the engineer agree with the details of the drafted statement, the contractor has to prepare and submit the Final Statement to the engineer (FIDIC, 1999). These documents should be paid high attention because they contribute to better understanding between the contract parties and reduce claims and disputes in the project.

In some situations, opinions or suggestions from experts may be useful to projects and the claim management process. The topics that sometimes require such assistance were laws and regulations, site and climatic conditions, productivity, financial, engineering and construction techniques, and etc. These opinions or suggestions have to be in written with complete supporting relevant concepts.

The construction supervisors shall continuously keep site diaries because they contain several important data required by claim management such as details of received documents received, issued instructions, delays, site and climatic conditions, productivity, work done, deficiencies in works, resources supplied by the employer, work information, special events, contractor's performance, and etc. Another group of important documents that are issued by engineers consists of payment certifications issued in several cases such as advance payment, interim payments, retention repayment, and final payments. They certify that contractors have completed all obligations they have to perform for the considered payments.

The documents in two groups directly concern with claims. The first group consists of: (1) notices of claim notification, (2) notices of monthly claim details, (3) notices of final claim details, (4) notices of claims for intellectual and industrial property rights, and (5) notices of delays caused by employer or contractor stated in the *Conditions of Contract for Construction (First Edition)* and the *Client / Consultants Model Service Agreement (Third Edition)*. On the other hand, the second group is comprised of the notice of claim determination. As mentioned in Section 5.2 [Documents Necessary to Claim Management], notices of claim notification are extremely important in claim management process because failures to submit such notices to the claimed

party bar the rights to claim. Notices of interim or final claim details are also important because they support the entitlement and damages claimed. Sub-clause 20.1 [Contractor's Claims] states that the contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate (FIDIC, 1999). After claim notification, the engineer shall consult with each party in order to reach agreement or to make a fair determination and then give notice of claim determination with supporting evidence to the parties.

The next two groups concern dispute resolution processes. Notices of dispute information referred to Dispute Adjudication Board (DAB), arbitrators, and mediators have to state the details of disputes, amounts of payments and times that the claimants considered themselves to be entitled to. After receiving the notices of dispute information, the DAB, arbitrators, or mediators (as the case may be) shall give decision to the parties according to the dispute settlement provisions stated in the *Conditions of Contract for Construction (First Edition)*, the *Client / Consultant Model Services Agreement (Third Edition)*, and ICC's Rules of Arbitration.

Finally, the records of employer's financial transaction or the financial reports are also important in claim management process. Large amount of claims are filed in order to request for additional payments. With the records of employer's financial transaction or the financial reports, employers can collect the payment paid or received by them, contract price, prices of materials, actual cash flow, etc.

5.4 Summary

This chapter reported the details and the findings of the Claim Document Importance Analysis. This phase aimed at analyzing the communication processes among parties in international construction projects in order to find the availability of important data required in the employer's claim management processes, the level of importance of each document flowing in the process, and guidelines to improve the efficiency of the processes.

The Claim Document Importance Analysis phase determined a representative model as a construction project complying with the provisions of the FIDIC's *Conditions*

of *Contract for Construction (1999)*, FIDIC's *Client / Consultant Model Services Agreement (1998)*, and ICC's Rules of Arbitration. All documents flowing in the representative model were examined in order to find the availability of the claim data. The missing data, the level of importance of each document, and guidelines for improving the system were also presented.

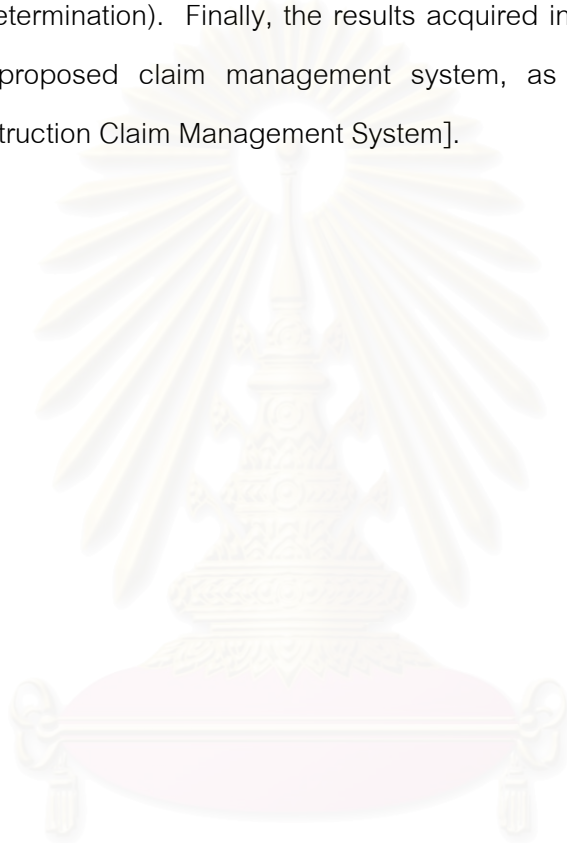
It was found that there are 393 documents, which can be placed into 232 groups of documents, flowing in the representative project. Most of them are submitted to or received by the employer or the engineer except six groups of documents (eight total documents). In these groups of documents, 143 groups (264 documents) contain necessary claim data. A full list of all groups of documents is shown in Appendix B. However, there are eighteen pieces of claim data missing from the mandatory documents of the representative model. These missing data can be placed into six groups of data by their contents: expert's opinion, equipment, financial, relationship, employer's use of work, and visitor.

In order to acquire all necessary claim data, additional fourteen groups of documents (eighteen total documents), for example, records of employer's equipment costs, records of employer's financial transactions, and notice of contractors' cost of capital, should be included in project documents. Furthermore, the Claim Document Importance Index, which shows how important the considered document is for claim management purposes, of each claim-related document was calculated by summing all Claim Data Importance Indices of all claim data contained in the document. By these indices, all documents were classified into three categories: (1) 83 groups of documents (164 documents) with high importance, (2) 60 groups of documents (100 documents) with medium importance, and (3) 83 groups of documents (121 documents) with low importance, respectively.

Three documents in the high importance group were found to have important roles in claim filing procedures according to Condition of Contract for Construction (First Edition). They are (1) notices of claim notification, (2) claim proposals, and (3) notices of claim agreement or determination. Without notices of claim notification, claimants may be considered that they have waived the rights to claim. Claim proposals are important because claimants shall be entitled to only the amounts they can clearly prove to be due

to them while notices of claim agreement or determination are claim management tools used to notify the results of claim settlement to the parties.

Employers should pay attention to high importance documents such as consultant's reports, minutes of meetings, notices of expert opinions, statements, site diaries, and financial reports, especially those were direct stated in claim filing procedures (notices of claim notification, claim proposals, and notices of claim agreement or determination). Finally, the results acquired in this phase were useful in designing the proposed claim management system, as described in Chapter 7 [Proposed Construction Claim Management System].



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER VI

PROBLEM-CAUSE-SOLUTION ANALYSIS

In this chapter, the problems and recommendations collected in the questionnaire survey and interviews were analyzed by the Cause-Effect Diagram Technique for finding their significant causes and adverse effects. These acquired causes of problems were then analyzed by the modified Fishbone Diagram in order to find the guidelines for improvement of existing claim management systems. The findings were used to design the Guidelines for Improving Claim Management Efficiency, which help the employer avoid and remedy the claim management problems, as well as increase the employer's claim management efficiency.

6.1 Description

This step aimed at collection of, finding causes of, and proposing recommendations to mitigate claim management problems. It was done in the following phases:

1. Problem data collection phase

Problems of Thai employers' construction claim management and some claim management improvement recommendations were collected by a questionnaire survey and interviewing of key construction staff of employer organizations and consulting companies, as shown in Table 3-11 and Table 3-16 respectively. All problems and improvement recommendations collected from questionnaires and interview surveys were used in the following analyses.

2. Analysis phase

This phase aimed at finding causes, effects, and guidelines to improve the claim management in Thai construction industry. The problems and recommendations collected from the data collection phase were analyzed by Cause-Effect Diagram and modified Fishbone Diagram respectively.

a. Problem-cause analysis

The causes and the adverse effects of each problem acquired from the questionnaire survey and the interviews were analyzed by using the Cause-Effect Diagram (Fishbone Diagram), as shown in Figure 6-1. This kind of diagram is normally used to identify and organize causes and effects of a problem. However, this figure shows the causes and effects of all claim management problems simultaneously.

b. Cause-solution analysis

After determining of the causes of the problems found in Thai construction industry, the guidelines to solve the collected problems and improve efficiency of existing claim management were analyzed and presented by a modified Fishbone Diagram, as shown in Figure 6-2. In this diagram, the problems, caused by several causes shown in Figure 6-1, are protected or eliminated by several measures.

6.2 Problems of Existing Claim Management Systems and Their Causes

6.2.1 Problems of Existing Claim Management Systems

From analyzing the problems and recommendations collected from the questionnaire survey and interviews, discussed in Chapter 3 [Survey of the Construction Claim Management Systems], the acquired problems and recommendations were placed into several groups by their relevant processes such as claim management process, contract management process, project management process, construction management process, and procurement process, as shown in Table 6-1.

Table 6-1 Problems and Recommendations Collected from the Surveys

Problem	Recommendation
1. Claim Management Process a. Contractors' Lack of Claim Management Skills b. Engineers' Delays in Response to Claims	1. Claim Management Process a. Avoidance of Unnecessary Claims b. Efficient Claim Data Collection c. Prompt Notification of Entitlement to Claims

Table 6-1 Problems and Recommendations Collected from the Surveys (Cont.)

Problem	Recommendation
<p>c. Contractors' Delays in Response to Claims</p> <p>d. Insufficient Time Allowable for Claims</p> <p>e. Different Claim Amounts Calculated by Parties</p> <p>f. Bureaucratic Regulations Related to Claims</p> <p>g. Lack of Necessary Data</p> <p>h. Employers' Prevailing Powers</p> <p>i. Deficient Contract Provision Related to the Supervisors' Fees in Case of Excusable Delays (Public Project)</p> <p>j. Lawyers' and Engineers' Different Opinions</p> <p>k. Negligence of Claim Management</p> <p>l. Negative Attitudes toward Claims</p> <p>m. Not Knowing the Rights to Claim</p> <p>n. Failure to Give Notices</p> <p>o. Not Knowing What Data are Required</p> <p>p. Unavailability of Some Contractors' Data</p> <p>q. Unavailability of Claim Standard Forms</p> <p>r. Method of Calculation</p> <p>s. Large Amount of Claims</p> <p>t. Defects Occurring from Employers' Misuses of Works</p> <p>u. Contractors' Over-estimation of Claim Damages</p>	<p>d. Establishing Claim Settlement Organizations</p> <p>e. Increasing Claim Engineers' Capability</p> <p>f. Reservation of Rights to Claim</p> <p>g. Preparation of Claim Standard Forms</p> <p>h. Early Recording of Details of Claim-leading Events</p> <p>i. Use of Productivity Data in Analysis</p> <p>j. Taking account of Efforts to Relieve Damages, Urgency, and Easiness to Perform Works</p> <p>k. Establishing Academic Centers</p> <p>l. Use of Schedule Analysis</p> <p>m. Use of Negotiation</p> <p>n. Supporting Engineers' Roles in Claim Negotiation</p> <p>o. Settlement by Comparison of Each Party's Record</p>

Table 6-1 Problems and Recommendations Collected from the Surveys (Cont.)

Problem	Recommendation
<ul style="list-style-type: none"> v. Contractors' Reluctance to Claim w. Limited Decision Powers of Employment Supervisory Committees (Public Project) x. Difficulties in Correction of Contract Values (Public Project) y. Abilities to Claim for Some Claim Components 	
<ul style="list-style-type: none"> 2. Contract Management Process <ul style="list-style-type: none"> a. Differences in Contract Interpretation b. Incomplete Contract Documents c. Incomplete Variation Orders d. Contractors' Lack of Contract Knowledge e. Contractors' Failures to Comply with the Warranty Conditions f. Ignorance of Some Contract Provisions by Contractors g. Oral or Multi-persons Variation Orders h. Unclear Engineers' Responsibilities i. Supervisors' Lack of Laws and Regulations Knowledge j. Negligence of Contract Reviewing k. Too Much Focusing on Wording of Provisions 	<ul style="list-style-type: none"> 2. Contract Management Process <ul style="list-style-type: none"> a. Preparing Complete Contract Documents b. Specifying Appropriate Defects Liability Period c. Issuing Clear Variation Orders d. Analyzing Outcomes before Issuing Variation Orders e. Signing Separate Contracts for Large-Amounted Variation Orders f. Contract Knowledge Improvement g. Focusing on Reasons, not Wording h. Deliberate Scrutinizing of Contract Documents
<ul style="list-style-type: none"> 3. Project Management Process <ul style="list-style-type: none"> a. Lack of Clear Regulations b. Lack of Personnel c. Weak Enforcement of Regulations 	<ul style="list-style-type: none"> 3. Project Management Process <ul style="list-style-type: none"> a. Establishing Effective Data Management System b. Establishing Effective Coordination

Table 6-1 Problems and Recommendations Collected from the Surveys (Cont.)

Problem	Recommendation
<ul style="list-style-type: none"> d. Confusing and Unpredictable Regulations e. So Many Regulations f. Inconsistency between Departments g. Unavailability of Concerning Regulations 	<ul style="list-style-type: none"> c. Complying with Related Regulations d. Enhancing Project Flexibility e. Enhancing Cooperative Atmosphere f. Improvement of Related Laws, Regulations, and Standards g. Increasing Equality between Employers and Contractors h. Implementation of Efficient Document Control System i. Written Documentation j. Reducing Number of Documents
<p>4. Construction Management Process</p> <ul style="list-style-type: none"> a. Employers' Lack of Construction Knowledge b. Failure to Submit Reports c. Incomplete Records d. So Many Documents 	<p>4. Construction Management Process</p> <ul style="list-style-type: none"> a. Deliberate Controls of Payments b. Demanding the Contractors to Propose Details of the Construction Methods before Performing Their Work
<p>5. Procurement Process</p> <ul style="list-style-type: none"> a. Incompetent Contractors b. Contractors' Refusal of Responsibilities 	<p>5. Procurement Process</p> <ul style="list-style-type: none"> a. Selecting Competent Contractors b. Selecting Competent Engineers c. Specifying the Reasonable Reference Prices
<p>6. Ethics</p> <ul style="list-style-type: none"> a. Contractors' Ignorance of Professional Ethics b. Corruption c. Partiality of Engineers d. Unfair Contract Modification 	<p>6. Ethics</p> <ul style="list-style-type: none"> a. Maintaining Professional Ethics b. Enhancing Consultants' Impartiality

Table 6-1 Problems and Recommendations Collected from the Surveys (Cont.)

Problem	Recommendation
7. Other Processes a. Impractical Designs b. Contractors' Preference to Dispute Resolution	

From Table 6-1, it was found that the problems of claim management process were caused by the inadequacies of both the claim management process itself and the other systems while some problems were caused by lack of ethics (i.e., problems of corruption, engineer's partiality, and unfair modification of contracts). From this reason, in solving the existing problems and improving the existing claim management system, not only the process of claim management, but also the other processes, especially the contract management process, as well as ethics of all concerned parties shall be improved.

Several claim management problems were in the claim management process itself. From the surveys, claims were normally viewed with negative attitudes such as causes of disputes, indicators of the management inefficiency, and behavior of tricky contractors, as discussed in Section 3.3 [Interview]. Similarly, claim management was viewed as unnecessary and was paid a low level of attention in several organizations. There were bureaucratic regulations in the employers' organizations, especially those of the public sector. As to the contractors, some of them lack claim management skills and were reluctant to claim against their employers while some contractors filed many claims to seek for compensation for damages occurring from bid buy-in. The main problem of the claim identification process was that the claim manager did not know when the rights to claim occur in the project. As to the claim notification, parties frequently failed to send notices of claim on time.

Some respondents did not know what data are necessary in claim management process. In addition, some contractors' data such as contractors' costs of capital and profiles were not available to them. In performing claim analysis, the problem related to the claim documentation sub-process was the lack of necessary data. The parties

occasionally used different methods of calculations, leading to the different amounts and disputes. Moreover, there was a provision in the public standard form of construction contract concerning the engineer's remunerations in case of excusable delays that did not support the engineer's impartiality. In preparing claim proposals, there were several problems such as insufficient time allowable for claims, unavailability of claim standard forms, defects occurring from employers' misuses of works, and contractors' over-estimation of claim damages. Finally, one problem found in negotiation phase was the different leverage between the employer and the contractor. The employer had very high prevailing power over the contractor but sometimes the process had to be suspended because the employer's representative needed to wait for the employer's permission. Another problem was the limited number of claim components: variation, price escalation, and delay were allowed in Thai construction industry. In public contract, both parties found difficulties in correction of contract prices and needed to use other weird solutions such as increasing or decreasing the scope of works to keep the contract price unchanged.

There were several problems in contract management process that affected the claim management. The survey results showed that some employer staff and the contractor still lack contract management knowledge and skills. Contract documents were sometimes incomplete and some provisions such as those concerning the engineer's responsibilities were unclear. The contract interpretation between the employer and the contractor was sometimes different and focused too much on wording, instead of the intention. The contract reviewing was neglected and the contractor ignored some contract provisions and avoided performing his obligations. As to variation orders, the problems were that incomplete or oral or multi-persons variation orders were frequently issued from the employer's staff.

The survey results revealed that inadequacies in regulations were the main groups of the claim management problems related to the project management process. The problems in regulations were lack of clear regulations, weak enforcement, confusing and unpredictable outcomes of provisions, unavailability, and too many relevant regulations. The other problems concerning project management were lack of personnel and inconsistency between departments. Staff from legal department often

had different opinions on some topics, such as extension of time, from construction management staff.

There were four acquired problems that were relevant to the construction management process. The employer sometimes caused difficulties to their contractors or engineers by their lack of construction knowledge. Failures to submit reports and incomplete records were the main problems in this group. Finally, too many documents in the process were also problems.

There were some problems in design, procurement, and dispute resolution processes. Procurement of incompetent and irresponsible contractors caused several adverse effects to the project. As to project design process, impractical designs and deficiencies in designing process made the project delayed. Some contractors preferred dispute resolution procedure to filing claim against their employers because they did not want to notify their employers about the problems occurring in the projects.

The last group, ethics problems, got higher concerns in Thai construction industry than those in the past. The examples of such problems were the contractor's and the engineer's corruption, partiality of the engineer, and unfair contract modification by the employer.

6.2.2 Causes of the Problems of Existing Claim Management Systems

After analyzing by Cause-Effect Diagram, it was found that the problems found in Thai claim management process led to several adverse effects: (1) failure to claim, (2) difficulty in claim settlement, (3) unfairness, (4) delayed process, (5) large amount of claims/ disputes, (6) non-value-added works, and (7) practices not being international. The causes of these problems are parties' deficiency, defaults, law and contract provision inadequacies, and nature of construction claims. Figure 6-1 shows the causes of problems in Thai employers' construction claim management.

1. Incapability

The interviews revealed that there are some problems caused by the incapability of the parties: employer, contractor, engineer, and law department staff. Some employers lack necessary contract management skills and construction process understanding. Some public authorities face lack of construction supervisory staff

because of the government's downsizing policy. In addition, there are some negative attitudes and ethics found. For examples, some employers believe that contractors should bear all risks, that proclaiming contractors are lazy contractors who try to seek windfall profits by making claims, that engineers are their full-time employees who should protect their employers' benefits by all means, that claims or disputes are indicators of staff inefficiency, etc.

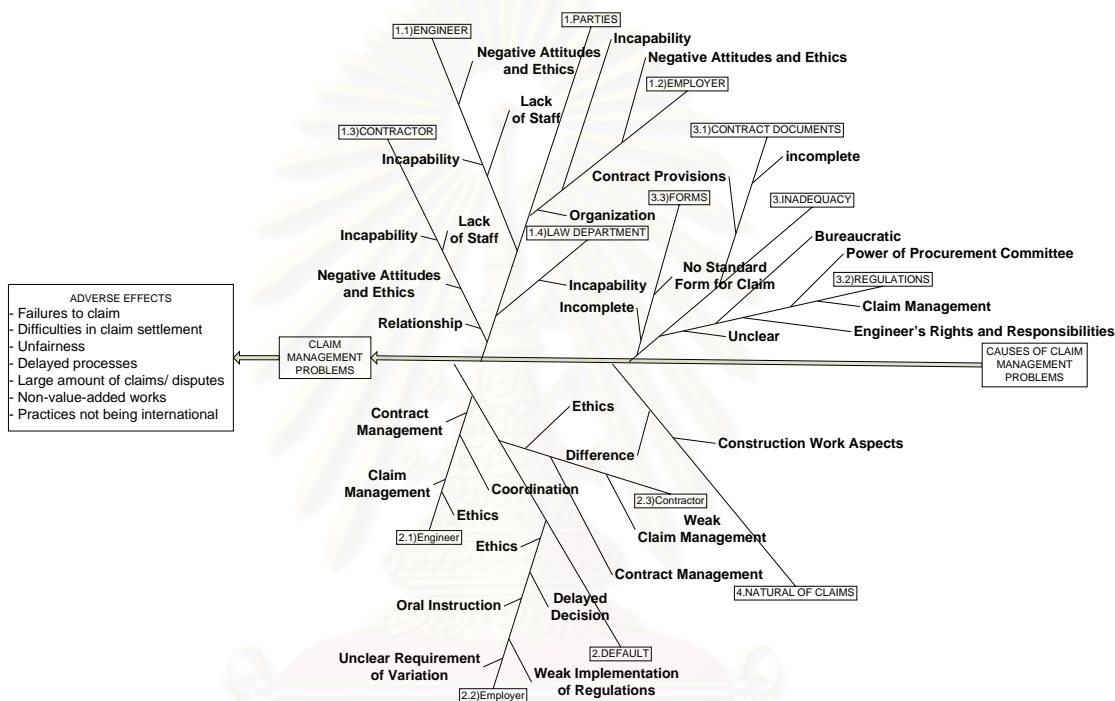


Figure 6-1 Causes of Problems in Thai Employers' Construction Claim Management

As to contractors, some of them lack construction management skills and claim management proficiency, especially in documentation. Some insufficiently support their staff in performing their works. A great deal of contractors has corruption or bid-collusion attitudes. Some do not realize the importance of claim management, contract reviewing, and record keeping.

From the results of questionnaire survey and interviews, some Thai engineers also have limited knowledge in construction law, regulations, contract management, and claim management. Some organizations have insufficient staff. The employers sometimes give them limited power to perform their obligations. Some engineers have

negative attitudes similar to the employers' towards the contractors' risks and the claims. Some engineers, particularly those in the public sector, believe they should protect their employers' benefits by all means. Some do not realize the importance of contract management, claim management, and strict implementation of regulations. Important processes such as reviewing contract, preparing complete contract documents, keeping records, and issuing complete variation order are sometimes given little attention.

Causes of claim management problems were also found when another party had an important role in claim management, the law department officer. Some of them do not understand construction methods and practices. Time extension is one of the topics those cause different decisions between the engineering staff and law staff.

2. Defaults

There are a number of problems caused by the parties' defaults in performing their obligations. Employers can cause problems if they give oral or unclear instructions to the contractors, or have weak implementation of regulation monitoring. Some employers make decisions quite late, causing damages to their contractors. Interview results also showed that some employers issued unfair instruction or judgment, and tried to take advantages of their contractors.

Similarly, Thai contractors also have defaults. The survey results showed that some contractors have insufficient contract management skills: poor record keeping, failure to submit reports, and refusal of responsibilities, etc. Some contractors, especially the local contractors, have poor performance, which increases a number of claims and disputes. As to claim management, the contractors always fail to comply with notice requirement provisions. Some interviewees also mentioned bid collusion.

It was found from the surveys that engineers can also cause problems by omission or weak performance of their duties such as checking reports from contractors, confirming oral instructions, keeping necessary records, and issuing incomplete instructions or variation orders. In the claim management process, weak enforcement of notice requirements, inefficient claim documentation, and delayed responses to claims lead to problems. Poor communication is also a source of problems caused by engineers. The communication of important information (i.e., claim data, instructions,

and site visitors' details) or internal communication is always insufficient. Moreover, partiality of the engineer is one of the causes bringing difficulties to contractors.

3. Inadequacies in contract documents and regulations

Inadequate contract documents and regulations are significant sources of problems. From the survey, some contract documents were incomplete. As to contract provisions, there are several deficiencies those lead to problems for claim management processes. In Thai public standard construction contract, the inadequate provisions consist of claim-related provisions, and unclear & titanic employers' and engineers' rights.

Focusing on the claim-related provisions in Thai public standard contract, the payment to the engineer in the case of the contractors' excusable delay, the contractors' right to claim, the contractors' claim for additional payments, and the notice requirement are the provisions those lead to problems. In Clause 17 [Delay Damages], the contractor shall bear engineers' remuneration if the contractor is responsible for the project delay (Office of the Council of State, 2006). However, problems of responsibility to bear such payment will occur when the project is delayed by a cause the contractor is not responsible for. One respondent revealed that he had experienced difficulties of not being paid for the construction supervisory fee in such situations. He added that he tried to claim for the payment, but the officers used contract provisions and bureaucratic public procedures to defense the claim. He reported that he had wanted to terminate the contract but unluckily he could not do that for fear of being blacklisted.

Thai public contracts are always silent about the contractors' rights including the rights to claim against his employer. In addition, the provision allows only for time extension. Additional payment will be allowed only in a few cases: extra work and price escalation. Notice requirement is another provision that need to be reviewed. The contractor shall notify his employer within fifteen days after the end of the event entitling him the right to claim (Office of the Council of State, 2006). This provision bars the objective of the notice requirement (e.g., alarming the claimed party and allow opportunity to alleviate the damages). Moreover, some respondents, both contractors and engineers, thought that the number of days allowed for filing claims was not enough.

On private projects, the contracts are normally acquired by two sources: modified international standard contracts and custom-made construction contracts. The construction contracts prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) are widely used in Thailand. Some respondents revealed that they have their own construction contract forms, which were adapted by modifying the previous contracts or prepared by their consulting lawyers. However, titanics employers' and engineers' rights and silence of contractors' rights are also found in private contracts.

Thai public organizations have to comply with government regulations. In the procurement process, the "Prime Minister's Office Regulations Governing Procurement 1992" is the main regulation covering public procedures for purchasing hardware, hiring contractors, hiring consultants, etc. According to such regulation, claim management responsibilities belong to an "employment supervisory committee", which consist of a chairman and at least two qualified persons. The committee has power to 1) review the reports from the contractor and the construction supervisor, 2) perform field supervision and variation order, and 3) approve interim payment (Office of the Council of State, 2006). However, several respondents viewed such regulations as unclear and bureaucratic. Employment supervisory committee sometimes have limited power to make decisions and have to ask for permission from higher rank officers, causing delay to the projects. Government regulations are also silent about the methods for analyzing construction claims.

From interviews, almost all organizations have standard forms used for collecting data and for communication of necessary information. However, only a few organizations have standard forms used for claim management purposes. Some respondents accepted that some forms used in their organizations are incomplete.

4. Nature of construction claims

The last group of causes of problems in claims is the nature of construction claims. Because of these factors, construction claim management problems tend to occur, even though all parties try their best to protect from problems. Firstly, claims occur among the different parties in a construction project who have different expertise, roles, responsibilities, backgrounds, and available information. Secondly, claims always

tend to cause inconvenience, impact on relationships, and sometimes unfavorable outcomes. Thus, some parties are reluctant to file a claim.

6.3 Guidelines for Improving Efficiency of Existing Claim Management Systems

6.3.1 Recommendations collected from the surveys

From the surveys, claim management process can be improved by improving both the claim management process and the other relevant processes such as contract management, project management, construction management, and procurement. In addition, improving ethics of every party's ethics can also improve the claim management process.

The employer shall increase the capability of the claim management staff and establish academic centers that give advises to the staff about the effective claim management. In claim notification, the employer has to promptly notify the contractor of his intention to reserve entitlement to claims. The claim analysis sub-process was suggested taking account of several factors such as productivity, efforts to relieve damages, urgency, and easiness to perform works in analysis and uses of schedule analysis for analyzing delays. In preparing claim proposals, the employer shall avoid filing unnecessary claims to save his resources and to maintain good working atmosphere. Preparation of claim standard forms can also enhance the process efficiency. The last sub-process, claim negotiation, shall be improved by supporting the use of negotiation. Both parties should settle claims by comparing each party's records and the engineer must have significant roles in claim negotiation. Finally, the claim settlement organization should be established to help both parties in claim settlement.

In contract management, another important process, the surveys showed that the process can be developed by improving staff's contract knowledge and preparing complete contract documents. Construction contracts shall specify appropriate defects liability period, which is not too long or too short. Too long defect liability period is unfair to the contractor and leads to higher contract price while too short defect liability period increases the employer's risks. In addition, the contractor has to deliberately scrutinize contract documents before submitting the bid proposal. The contracts of different

projects may be different, though they are derivatives of the same standard contract. In contract interpretation, intentions of the provisions should be taken into account. As to variation orders, the survey participants recommended the engineer to analyze the possible outcomes before issuing and issue clear variation orders. If the amount of variation is great, compared to the original contract value, some participants suggested signing a separate contract.

The project management process is an important process that has great influences on the claim management. There were various suggestions concerning how to improve the project management process in a construction project, which leads to the better claim management. The employer shall establish an effective data management system and a document control system, which helps reduce the numbers of documents flowing in the project. In addition, the employer has to establish good coordination among project parties and enhance cooperative atmosphere. The gap between the bargaining powers of the employer and the contractor shall be reduced. This suggestion can be achieved by using the accepted standard forms of contracts, which fairly allocate rights and responsibilities between the contract parties. Another group of the project management recommendations was to comply with related regulations. In addition, some regulations, such as the "Prime Minister's Office Regulations Governing Procurement 1992" and the standard construction contract of Thai, had deficiencies in claim procedures and needed to be improved. After revision of the relevant laws, regulations, and standards, such rules shall be followed by all parties concerned. Final suggestion to the project management was to enhance project flexibility. There should be some allowances for the reasonable changes or delays occurring in projects.

As to the construction management and procurement processes, survey results revealed that the employer shall control the contractor by deliberate controls of payments and demanding the contractor to propose details of the construction methods before performing the work. To minimize the number of problems occurring in the project, the employer shall selecting competent staff and contractor. Reasonable reference price help reduce the number of claims causing by the contractor's searching for sources of higher revenues.

Finally, every party shall maintain high standard of professional ethics. The employer should be fair to the contractor while the contractor should avoid corruption or bid collusion. The engineer should maintain the impartiality in performing his obligations such as determinations.

6.3.2 Guidelines for Improving Efficiency of Existing Claim Management Systems

Each cause of the problems analyzed in the Cause-Effect Diagram and recommendations given by the respondents was analyzed to find the appropriate prevention or remedying measures and the modified Fishbone Diagram was constructed. The acquired modified Fishbone Diagram showed that the Guidelines for Improving Claim Management Efficiency consist of educating and providing consulting services, implementation of systems, revision of regulations and contract provisions, and tuning parties' attitudes and ethics. Figure 6-2 shows the Guidelines for Improving Claim Management Efficiency.

1. Educating and providing consulting services

To mitigate problems occurring from parties' inadequacies, project staff members should be educated with at least the necessary knowledge they need to perform their responsibilities well. From the analysis, employers have to know about construction processes, and some of their contractual rights such as defect liability and rights to vary.

Besides the knowledge about construction processes, engineers should know about related laws and regulations and contract and claim management processes. To properly manage construction claims, the engineer should know how to comply with the relevant regulations and what the expected outcomes are in performing a contractual transaction. They should know how important the contract review process is, how contracts should be prepared, which documents are important in the claim documentation process, and what good practices are in performing their responsibilities consisting of issuing instructions and ordering variations. Focusing on the claim management process, the knowledge that an engineer should know is comprised of his rights to claim, the necessary documents, and claim analysis methods.

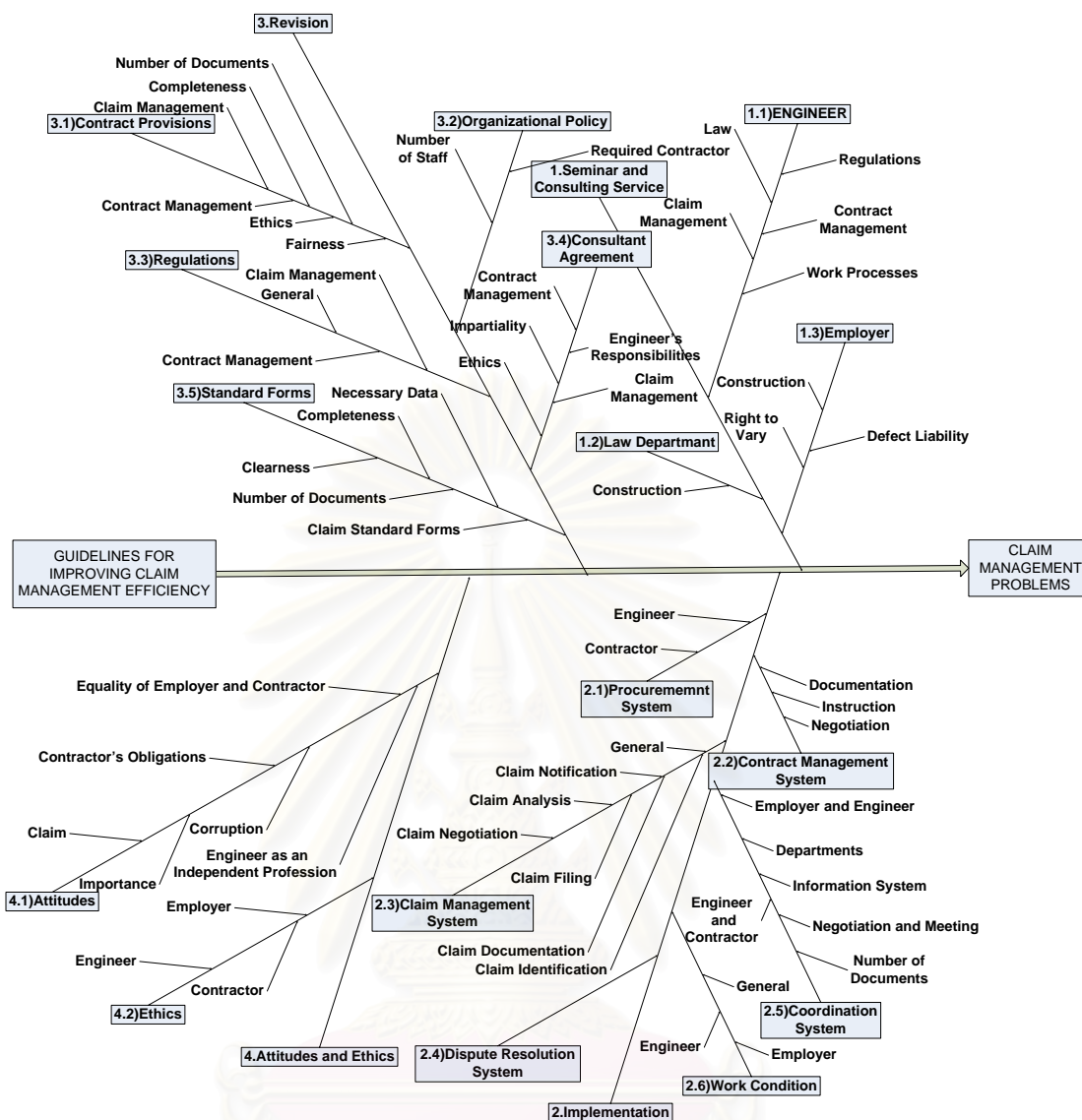


Figure 6-2 Guidelines for Improving Claim Management Efficiency

In case an educational approach seems to be inappropriate or unpractical, some aspects of the claim management knowledge mentioned above can be provided by consulting services.

2. Implementation of systems

According to the analysis results, not only claim management, but also several problems were caused by the other systems. In implementation of an effective claim management system, the employer should pay attention to the system both in general and to all phases of claim management. In general, there should be a person who is particularly responsible to manage claims. This arrangement will allow project

managers to concentrate on construction process as well as ensure that claims occurring in the project are closely monitored. Notice requirements, reporting mechanisms and other contract provisions related to claim management should be strictly complied with. Recording of claim data should be performed from the project beginning until the end of the defect liability period. In big projects, a document control system should be implemented in order to facilitate the data searching process. Claim leading events proposed by Adrian (1988) should be closely monitored.

As to claim analysis processes, the analysts should use the internationally accepted approach, on account of its simplicity. More types of claims should be allowed such as additional cost due to loss of productivity, interest or finance cost, and overhead cost. The claim should be notified early in order to meet contract provisions and give the other party the chance to mitigate damages. Finally, parties should try their best to settle claims in the negotiation process before they become disputes.

In order to enhance the efficiency of the claim management process, other systems should be concurrently implemented: a procurement system, a contract management system, a dispute resolution system, and a construction management system.

3. Revision of regulations and contract provisions

Regulations and contract provisions are very important to claim efficiency. They specify the parties' rights and responsibilities and describe the claim procedures. In order to improve claim management efficiency, it is necessary to revise contract provisions, regulations, organizational policies, consultant agreement provisions, and standard forms used in a construction project.

Analysis of data acquired by interviews and reviewing the Thai public standard form of construction contract revealed that there are several claim-related provisions that need to be inserted or revised:

a. The rights to claim, especially those of the contractor, should be more clearly specified. In Clause 22 [Extension of Time for Completion], the contractor is entitled to a time extension only in the following cases: force majeure, employers' default, and the cause for which the contractor is not responsible. The last cause of delay seems to be meaningless and confusing.

b. Contracts should determine prior notice requirement. In Clause 22 of Thai public contract provision, the contractor has to submit the claim proposal to the employer with fifteen days after the cause of claim is finished. The objective of the notice requirement is to give the claimed party the chance to protect or relieve the damages occur or going to occur.

c. The time limitation for filing claims should be extended, compared with the 42 days in FIDIC (1999), 21 days in AIA A201 (1997), and 60 days in EJCDC C-710 (2002).

d. The compensation mechanism should also be revised. Thai public contract does not say anything about the contractors' rights to additional payment except price adjustment due to quantity variations. Interviews showed that the contractor will receive additional payment only in the following cases: extra-work, price escalation, and quantity variation.

e. There is a clause that does not motivate the engineer to be impartial. Clause 17 [Liquidated Damages] of the public standard form of contract specifies the contractors' obligation to pay the construction supervisors' fee for non-excusable delay while the public regulation does not permit additional payment to the supervisor in the case of excusable delay or compensable delay.

The guidelines for improving private contract provisions vary according to the provisions of contract. However, interview results showed that the majority of the standard contracts were derived from the FIDIC standard form of contract, with some modifications. The modifications were done by (1) deleting the unnecessary provisions, and (2) inserting or modifying the provisions that give the employer the advantages over his contractor. For these mentioned reasons, the private contract provisions should be modified in order to enhance fairness among all parties concerned.

As to other contract provisions, Thai contract should enhance the engineers' impartiality and the employers' and contractors' fairness. Moreover, it should be complete, fair, and contain the appropriate number of documents.

There are a lot of inadequacies found in Thailand's public construction employer - engineer agreement. This form of agreement is widely used in engineer employment for Thai public projects. In order to enhance claim management efficiency, this form of agreement should be modified in a number of aspects, including lack of important

provisions (i.e., Impartiality of the Engineer, Obligations of the Employer, Variation, Extension of Time, Audit of Records, Late Payment, Changes in Legislation, Limitation and Duration of Liabilities, Delay Claim) and inadequacies of the existing provisions: Clause 19 [Engineer's Remuneration in Delay Contract]. In cases where the contractor is responsible for delayed work, the engineer shall be entitled to remuneration only if the employer can claim the delay damages (Tochaiwat and Chovichien, 2003a).

Government regulations related to construction project procurement should also be revised. In general, they should be clear, fair, non-bureaucratic, and should contain the appropriate number of documents. The procedure to claim or to respond to claims from other parties should be clearly specified, including the accepted analysis methods. The process of adjusting the contract price should be revised in order to facilitate the variation order process. The employment supervisory committee should have enough power to make decision regarding project and the engineers' impartiality should be ruled.

Besides the contract provisions and the regulations, the organization policies and the standard forms used also need to be revised. The number of project staff should match the workloads and the characteristics of the required contractors which should be clearly pre-specified in order to ensure acquisition of qualified contractors. The forms used for collecting or communicating the important claim data should be standardized, complete, clear, and containing of all required data. The number of forms used should be appropriate.

4. Tuning parties' attitudes and ethics.

The final guideline for improving claim management efficiency is dedicated to enhancing good attitudes and ethics. According to the Problem-Cause-Solution Analysis, there are several measures that need to be done to enhance good attitudes and ethics. Claims should be viewed as a tool of fairness which can occur in every project. The importance of effective claim management as well as contract management should be realized. Corruption is dangerous to the industry and should be avoided. The contract should be fair to all relevant parties and the contractor should bear a suitable degree of risks and responsibilities. Finally, the engineer should be looked as an independent professional party, not the full-time employee of the employer.

Furthermore, every relevant party in a construction project should have a high ethical standard. The engineer should avoid corruption and partiality. The employer should not take advantage of his contractor while the contractor should not commit corruption and overestimate claims.

6.4 Summary

The Problem-Cause-Solution Analysis aimed at collection of and finding causes of the problems, and proposing recommendations for mitigating them. The problems of Thai employers' construction claim management processes, which were collected by the questionnaire survey and interviews with key construction staff of employer organizations or consulting companies, discussed in Chapter 3 [Survey of the Construction Claim Management Systems], were analyzed by using a Cause-Effect Diagram to find their causes and their adverse effects. Then, the solutions of the problems were analyzed by using a modified Fishbone Diagram. In the modified Fishbone Diagram, the solutions of the claim management problems were shown in stead of their causes or effects.

Problems that reduce the efficiency of claim management process can be in both the claim management process itself and the other relevant processes of projects. From the questionnaire survey and interviews, there were several problems found in Thai claim management system, which can be placed into seven groups by their relevant processes: claim management, contract management, project management, construction management, procurement, ethics, and other systems. These problems lead to adverse effects such as failures to claim, difficulties in claim settlement, unfairness, delayed processes, large number of claims/ disputes, non-value-added work, and practices not being international.

As to the causes and solutions derived from the analysis, these problems are caused by various factors: parties' deficiencies, defaults, law and contract provision inadequacies, and nature of construction claims. Deficiencies of the staff of each party can cause problems in claim management. The examples of the causes of problems in this factor are the negative attitudes towards claims and claim management, lack of

staff, poor relationships, and insufficient knowledge and skills in some important fields such as claim management, contract management, construction management, project management, etc. Some problems are intentionally or negligently caused by the parties. The causes of problems in this group consist of breaches of contract or regulations, weak implementation of the necessary claim-supporting processes such as contract management, procurement, dispute resolution, coordination, project management, etc. There are some contract provisions and regulations that were found to cause the problems. Finally, construction claims can occur in every project because of some certain natures of them: differences among parties and unpleasant working atmosphere.

In order to increase the claim management efficiency, the employer should follow the suggested guidelines consisting of educating and providing consulting services, implementation of systems, revision of regulations and contract provisions, and tuning parties' attitudes and ethics. Claim management staff shall have adequate knowledge and skills in some fields such as claim management, contract management, project management, etc. These knowledge and skills can be obtained by providing education or consulting services. Not only claim management, but also the other claim-supporting processes such as contract management, procurement, dispute resolution, coordination, and project management shall be supported. Some contract provisions, regulations, and organizational policies have to be revised. Standard forms of claim documents shall be prepared and used in the project to facilitate the claim management process. Furthermore, positive attitudes towards claim and claim management as well as parties' professional ethics shall be supported.

The findings can help construction project employers avoid the adverse effects of claim management problems and increase their claim management efficiency by realizing the factors causing claim management problems or following the measures suggested in the guidelines. Finally, the results of the Problem-Cause-Solution Analysis were taken into account in the system design phase, as discussed in Chapter 7 [Proposed Construction Claim Management System].

CHAPTER VII

PROPOSED CONSTRUCTION CLAIM MANAGEMENT SYSTEM

After collecting all required data and performing all necessary analyses, an effective claim management system for the project employer was designed. Similar to other systems, this information system has four major components: input, processing, output, and feedback, as shown in Figure 7-1 (Stair and Reynolds, 2003). The important claim data and important claim documents acquired from the Claim Data Importance Analysis and the Claim Document Importance Analysis informed what the system inputs and outputs should be. On the other hand, the existing claim management procedures, problems, and recommendations acquired from the questionnaire survey, interviews, and Problem-Cause-Solution Analysis helped the researcher to design the processing procedure of the proposed system.

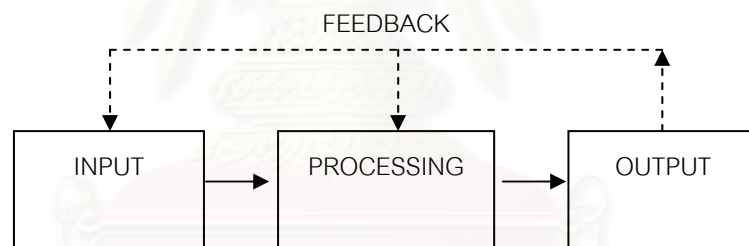


Figure 7-1 Basic Components of a System (Stair and Reynolds, 2003)

This chapter will describe details of the proposed system by its functions: (1) general system, (2) claim identification, (3) claim notification, (4) claim documentation, (5) claim analysis, (6) claim preparation, and (7) claim negotiation, respectively.

The design process was performed by considering all relevant design information: (1) problems and recommendations collected from the former questionnaire survey and interviews, (2) results from the former analyses: Claim Data Importance Analysis, Claim Document Importance Analysis, and Problem-Cause-Solution Analysis,

and (3) findings from reviewing related former works that can solve the problems or improve claim management efficiency.

7.1 Design Information

7.1.1 The General System

There were a lot of problems and recommendations acquired from the former steps. However, a majority of them concerned other systems such as construction management, contract management, procurement, project management, etc., which have indirect effects on the efficiency of the claim management system. In Problem-Cause-Solution Analysis, such problems and recommendations were used in finding the Guidelines to Improve Claim Management Efficiency, which help support the work efficiency of the claim management system. In the following design, only the problems and recommendations that directly concern the claim management system were taken into account.

The problems, recommendations, results from the former steps, and findings acquired from reviewing literature that can be used in designing the claim management system are shown in Table 7-1.

The negative attitudes to claims and the need of increasing claim engineers' capabilities can be remedied by implementation of the Guidelines to Improve Claim Management Efficiency while the avoiding filing unnecessary claims is a policy that all claim management systems follow in dealing with "unnecessary" claims. Therefore, the remaining problems consist of delay in response to claims and negligence of claim management problems. Moreover, provisions in the *Conditions of Contract for Construction (First Edition)*, the *Client / Consultant Model Services Agreement (Third Edition)*, and Rules of Arbitration of International Chamber of Commerce were recommended for use because they can set efficient contract procedures among parties and were used in the former steps as representative contractual relationships among parties.

Table 7-1 Design Information of the General System

Problem	Recommendation	Research Result	Finding from Former Works
1. Delay in Response to Claim	1. Establish the Claim Settlement Organization	1. Guidelines to Improve Claim Management Efficiency	1. Contract Provisions (FIDIC, 1999)
2. Negligence of Claim Management	2. Increasing Claim Engineers' Capability		2. Client-consultant Agreement Provisions (FIDIC, 1998)
3. Negative Attitudes to Claims	4. Avoidance of Unnecessary Claims		3. ICC's Rules of Arbitration (Craig, 1990)
			4. Information Technology

7.1.2 Claim Identification

Table 7-2 shows all of the design information for claim identification sub-processes. The only-one-but-important problem in this sub-process is that claim managers always do not timely realize the occurrences of the right to claim against the other party or, on the other hand, the right of the other party to claim against his party. In claim management, the employers usually act as the defenders waiting for claim notification from contractors. This practice causes losses to the employers because they may lose chances to collect data necessary to substantiate claims and, from a project management perspective, lose chances to avoid or reduce the damages occurring to them.

There were several research results acquired from the former steps that can help claim managers identify claims such as the Claim Event Impact Index, Claim Event Frequency Index, and Claim Event Severity Index. These indices will show project managers which events in the project he shall pay high level of attention. Suggestions

of the Guidelines to Improve Claim Management Efficiency also support the sub-process. Some findings such as Claim Alarming Events (Adrian, 1988) and results of a claim identification method surveyed by Callahan (1998) can also help claim managers in this function.

Table 7-2 Design Information of the Claim Identification Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Not Knowing the Right to Claim	-	1. Claim Event Impact Index 2. Claim Event Frequency Index 3. Claim Event Severity Index 4. Guidelines to Improve Claim Management Efficiency	1. Claim Alarming Event (Adrian, 1988) 2. Other Claim Identification Techniques (Callahan, 1998)

7.1.3 Claim Notification

The problem found in this sub-process was failure to give notice, as shown in Table 7-3. This problem is important because such obligation is normally stated in the contract. If one party fails to do so, he risks argumentation by the claimed party that the right to claim was waived by such failure. Employers have to submit notice to their contractors in order to reserve the rights to file claim as soon as is practical after they know their entitlement. Because the procedures to notify claims are different from one contract to another, the procedure specified in Sub-clause 2.5[Employer's Claims] and Sub-clause 20.1[Contractor's Claims] shall be followed for projects with the FIDIC's *Conditions of Contract for Construction (First Edition)*.

Because contracts normally state the time limit provision for notification of claims, some information technology such as electronic document management system

(EDMS) and electronic data interchange (EDI) can help expedite the notification process. Finally, Guidelines to Improve Claim Management Efficiency specifies the implementation of a good coordination system and document control system, and implementation of these guidelines can improve the claim notification sub-process.

Table 7-3 Design Information of the Claim Notification Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Failure to Give Notice	1. Reservation of Rights to Claim 2. Early Claim Notification	1. Guidelines to Improve Claim Management Efficiency	1. Contract Provision (FIDIC, 1999) 2. Information Technology

7.1.4 Claim Documentation

Table 7-4 shows the design information of the claim documentation sub-process. Compared with other sub-processes, there were a lot of problems and recommendations concerning claim documentation. Some claim managers did not know what data are required, some managers found problems with data availability such as lack of necessary data or some contractor's data, and lack of written documents or reports while some faced the problem of completeness of data such as differences in data format between departments and incomplete records. As to the recommendations, there are several recommendations that can increase performance of the claim documentation sub-process. They are mainly about improvement of data collection by several methods such as preparation of standard forms used for claim purposes, implementation of the document control system, and record keeping system.

There are also several research outputs that can improve claim documentation efficiency. A list of the claim data shows the important data need to be collected for claim management purposes. These pieces of data were divided by their Claim Data Importance Index and Claim Data Availability Index into four groups. The data with high Claim Data Importance Index but low Availability Index are those which need a high

level of attention. For the project adopting three standard documents, as mentioned in the general system part, the availability of all claim data can be ensured by adding fourteen groups of the Recommended Additional Documents to projects.

Table 7-4 Design Information of the Claim Documentation Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Not Knowing What Data are Required	1. Preparation of Standard Forms	1. List of Claim Data	1. Alternative Data Collection
2. Inconsistency between Departments	2. Early Recording of Details of Claim-leading Events	2. Claim Data Importance Index	Techniques (Adrian, 1988)
3. Failure to Submit Reports	3. Implementation of Efficient Document Control System	3. Claim Data Availability Index	
4. Incomplete Records	4. Written Documentation	4. List of Claim Documents	
5. So Many Documents	5. Reducing Number of Documents	5. Document Importance Index	
6. No Written Document	6. Efficient Data Collection	6. Recommended Additional Documents	
7. Unavailability of Some Contractors' Data		7. Guidelines to Improve Claim Management Efficiency	
8. No Claim Standard Forms			
9. Lack of Necessary Data			

The importance of documents for the claim management purpose can be assessed by their Claim Document Importance Index. Some data collection techniques such as camera, video camera recorder, and time-lapse photography may be helpful in some situations. The Guidelines to Improve Claim Management Efficiency can increase claim documentation efficiency because they support improvement of the data collection process, use of the standard forms, and education of staff.

7.1.5 Claim Analysis

Table 7-5 Design Information of the Claim Analysis Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Different Claim Amounts Calculated by Parties 2. No Concerning Regulation (Public Project) 3. Method of Calculation 4. Too Much Focusing on Wording of Provisions	1. Use of Productivity Data in Analysis 2. Taking account of the Effort to Relieve Damages, Urgency, and Easiness to Perform the Works 3. Establishing Academic Center 4. Use of Schedule Analysis	1. Employer's Claim Components 2. Guidelines to Improve Claim Management Efficiency	1. Contractor's Claim Components (Adrian, 1988) 2. Claim Pricing Methods 3. CPA Technique (Alkass and Harris, 1991; Al-Saggaf, 1998; Levin, 1998)

According to Table 7-5, there were four problems and four recommendations concerning the claim analysis sub-process. The problems of the claim analysis sub-process mainly concerned the difference in calculation methods adopted by the parties, leading to their different results. In public projects, there is no clear regulation concerning what method should be used and some calculation methods adopted by the public staff are different from the international approaches. Almost all recommendations suggested methods to calculate claim damages, both time and cost. One of the recommendations suggested establishing consulting divisions in organizations to provide suggestions about claim analysis methods. This approach is similar to those recommended in *Guidelines to Improve Claim Management Efficiency*.

In calculating claim damages, the calculation will be broken down into several parts according to the claim components. Adrian (1988) suggested the general contractor's claim cost components while this research analyzed the remaining components. Claim pricing methods as well as a delay calculation methods presented in former works were selected and suggested to be used in the claim analysis process.

7.1.6 Claim Preparation

Table 7-6 shows several problems concerning preparation of claim proposals or, on the other hand, reviews of proposals by the other party. Some projects have a large number of claims while in other projects the contractors are reluctant to file claims. Some employers misunderstood that the contractor has to be responsible for all types of defects occurring in the works during the defects liability period and claimed for damages due to their misuse of works. Other contractors always over-stated the claim damages in their proposals. Time limits specified in contracts are so important, yet sometimes the allowable time for preparing claim proposals is insufficient.

Similar to the claim notification sub-process, time and procedures to submit claim proposals that are specified in contracts are important. These provisions can be found in Sub-clause 2.5[Employer's Claims] and 20.1[Contractor's Claims] of the *Conditions of Contract for Construction (First Edition)* respectively.

Table 7-6 Design Information of the Claim Preparation Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Large Amount of Claims 2. Contractors' Reluctance to Claim 3. Defects Occurring from Employers' Misuses of Works 4. Contractors' Over-estimation of Claim Damages 5. Insufficient Time Allowable for Claim	-	1. Guidelines to Improve Claim Management Efficiency	1. Contract Provision (FIDIC, 1999) 2. Information Technology

7.1.7 Claim Negotiation

In the last claim management sub-process, the problems can be categorized into two main groups. The first group was related to the powers of the participants in the negotiation process. Employers always have prevailing power over contractors, but sometimes the works have to be halted to wait for decisions from an authorized person on the employer's side. The employment supervisory committees, as the employer's representative in public contracts, have limited authority in some decisions. The second group concerned the claim compensation mechanism. In Thai construction projects, especially in public projects, there are only some components allowed. Moreover, contract price adjustment in public contracts is so difficult that the other compensation methods such as issuing variation order for extra work or omission of work (as the case may be) are used in various projects.

As to the gathered recommendations, one respondent supported using negotiation in settling claims while one emphasized the roles of engineers in claim negotiation. In addition, some respondents gave their opinions concerning claim negotiation such as settling claims by considering their supporting reasons rather than contract provisions and by record comparison. These techniques are the individual's claim settlement techniques which depended on individual's profiles and experience.

Some literature such as that of Kululanga (1989) discussed effective claim negotiation. Complete records and contract and claim management skills suggested by the Guidelines to Improve Claim Management Efficiency can also enhance claim negotiation success. Design information of the claim negotiation sub-process is shown in Table 7-7.

Table 7-7 Design Information of the Claim Negotiation Sub-process

Problem	Recommendation	Research Results	Finding from Former Works
1. Employer's Prevailing Powers 2. Limited Powers of the Employment Supervisory Committee (Public Project) 3. Difficulty in Correction of Contract Value (Public Project) 4. Only Some Claim Components are Allowed	1. Use of Negotiation 2. Focusing on Reasons, not Wording 3. Engineer's Important Roles 4. Record Comparison and Holding Meeting	1. Guidelines to Improve Claim Management Efficiency	1. Claim Negotiation Technique (Kululanga, 1989)

7.2 Proposed Claim Management System

Figure 7-2 illustrates all parts of the proposed claim management system that was designed after analyzing all design information, comprising the results acquired from the surveys and analyses performed in the former chapters as well as from reviewing some of the former literature. In order to distinguish between information from these two sources, information that is a direct result of this research was shown with an asterisk (*).

The proposed system has six components, according to the claim management functions: (1) claim identification, (2) claim notification, (3) claim documentation, (4) claim analysis, (5) claim preparation, and (6) claim negotiation, respectively. The active claim management process consists of all six sub-processes while the defensive claim management process the claim notification sub-process is not required. Details of each component of the proposed claim management system can be found in Sections 7.2.1 to 7.2.7.

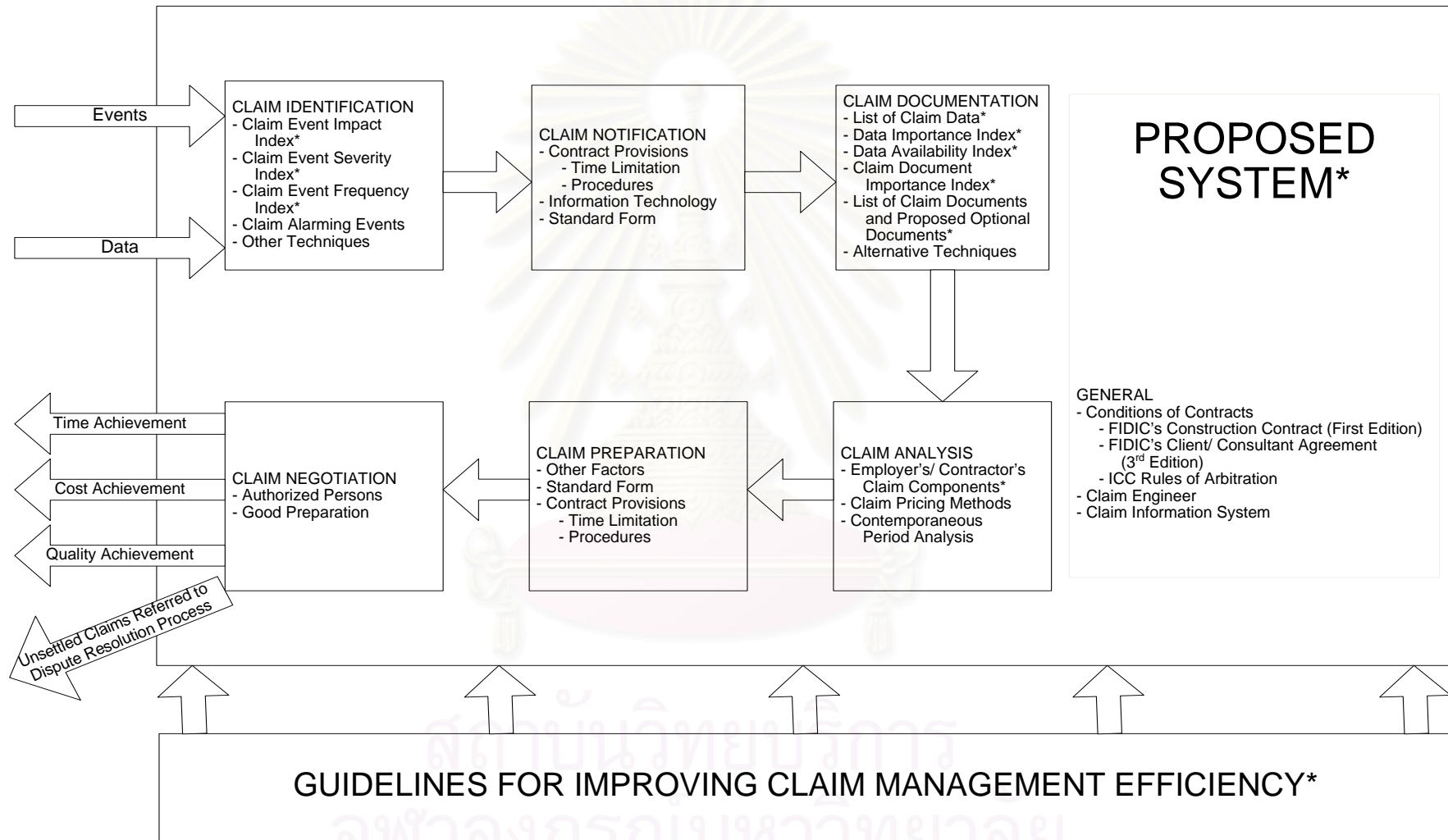
As to the claim management process, the system gains data from the parties concerned, for examples, employer, the engineer, the contractor, and the project environment in order to achieve the time constraints, cost constraints, and quality constraints of the claim management function. Unresolved claims will become disputes, which will be referred to the dispute resolution process specified in the contract. Its efficiency will be supported by the Guidelines for Improving Claim Management Efficiency discussed in Chapter 6 [Problem–Cause–Solution Analysis].

7.2.1 The General System

The components of the proposed system, in general, are comprised of several items as the following:

1. Contractual relationships and procedures

In order to determine the contractual relationships and claim procedures in a construction project, the provisions in several international standard documents are recommended:



Note: * from the results of this research

Figure 7-2 Proposed Employer's Claim Management System

- a. “*Conditions of Contract for Construction (First Edition)*” prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) in 1999.
- b. “*Client / Consultant Model Services Agreement (Third Edition)*” prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) in 1998.
- c. International Chamber of Commerce’s Rules of Arbitration (ICC’s Rules of Arbitration)

The reasons for selecting these documents as the framework were their well defined provisions and their frequent acceptance in the construction industry, especially in Thailand (Tochaiwat, 2001). Because the *Conditions of Contract for Construction (First Edition)* was used in determining claim components in the Claim Data Requirement Analysis, which was the upstream step affecting the following steps, and all of these three documents were set as the standard provisions of the representative project in Claim Document Importance Analysis step, using these standard provisions seems to give highly predictable results. However, the use of such standard provisions is not a serious requirement for implementation of the system. The proposed system may give acceptable results though not all of the above standard provisions are specified.

It should be noted that the governing law should be deliberately scrutinized because it may determine different rights and responsibilities of the parties from the standard international provisions in some cases. The possibly different provisions are those concerned with the written agreement, confidential details, forms of securities, ownership of the equipment, rights to terminate the contract, force majeure, and dispute resolution process (FIDIC, 1999). In Thailand, all provisions in the three standard documents (e.g., *Conditions of Contract for Construction (First Edition)*, *Client / Consultant Model Services Agreement (Third Edition)*, and ICC’s Rules of Arbitration) are applicable.

2. Staff responsible for managing claims

In order to solve the problem of negligence of claim management, as well as to recognize construction claims early, have complete records of claim data, respond timely to claims, and deal with claims professionally, the duties of managing construction claims shall be assigned to a person other than the project manager or

project director or other staff who are responsible to monitor the project performance. The reason is that those staff members are sometimes too busy to manage construction claims efficiently. Construction claim management needs close and deliberately monitoring and early response to the events related to claims such as events leading to the rights to claim, the contractor's claim notice, or the contractor's submittal of claim details.

Not only close claim management abilities, but also the capability to efficiently manage claims is an important reason to have such staff in construction projects.

3. Claim management information system

To solve the delay response problem found, an effective claim management information system shall be implemented in construction projects. The framework of the information system designed for managing construction claims is shown in Figure 7-3.

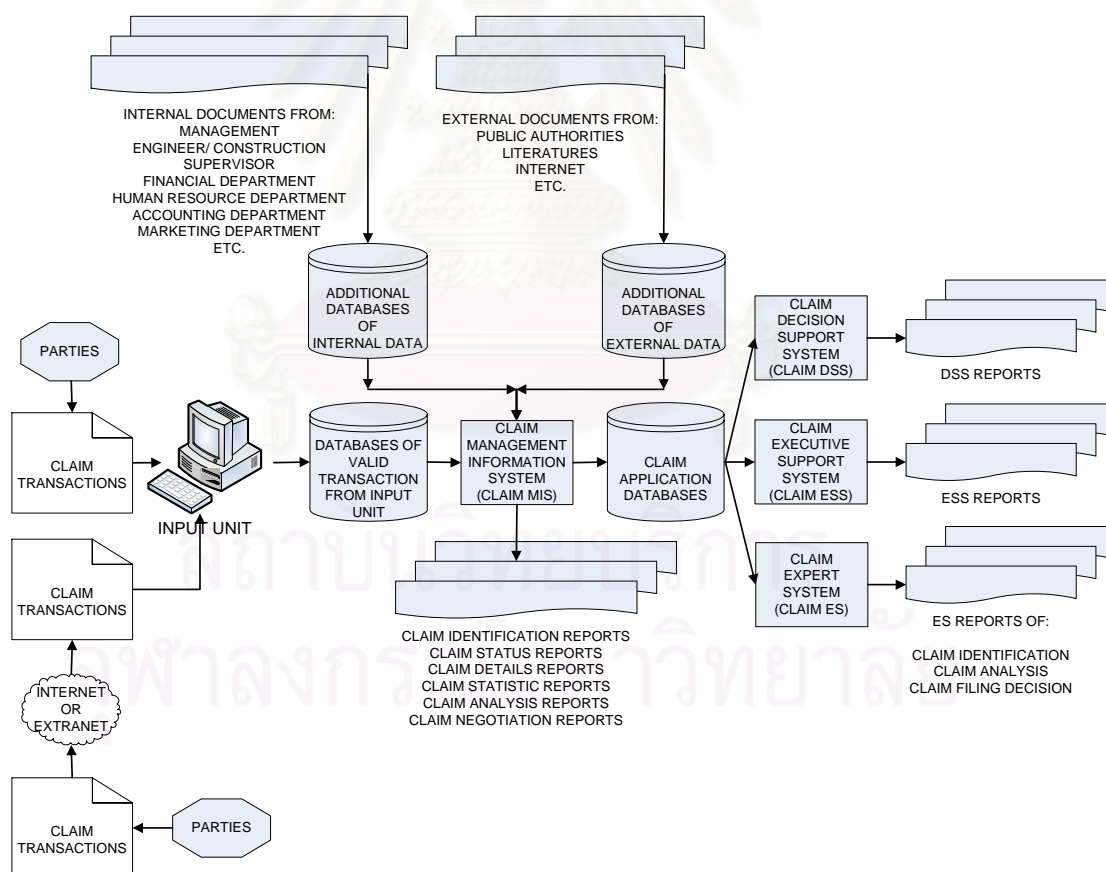


Figure 7-3 Framework of Proposed Construction Claim Management Information System

The transactions from all parties serve as inputs into the system, which consists of several components: claim input unit, claim management information system (Claim MIS), or other special-purpose claim information systems such as claim decision support system (Claim DSS), claim executive support system (Claim ESS), or claim expert system (Claim ES). The input data may be keyed into the system by project staff or downloaded via internet network. The data from the transactions will be processed and recorded in several report forms or kept in data storage. When claim manager requests routine reports for claim identification, claim status, claim details, claim statistics, claim analysis, or claim negotiation, MIS will retrieve the necessary data from the input-unit database, internal-data database, and external-data database.

In some situations, the claim manager may have to make a decision or solve some specific problems which are less-structured or need special expertise. The DSS, ESS, or ES system can be effective claim manager's helpers in performing such tasks. Examples of the said problems are those related to claim identification, claim analysis, and the decision to file a claim.

7.2.2 Claim Identification

In order to identify claims timely and accurately, the claim manager must know which events are worth a high level of attention and the techniques used for anticipating or identifying claims.

1. Events requiring a high level of attention

These events include those with high impact on the project, both of individual events or of all occurrences in a project. In addition, those modified from the work of Adrian (1988) are also recommended. To identify the impact of an individual claim event and of all occurrences in a project, the "Claim Event Severity Index" and the "Claim Event Impact Index" are useful indicators. The five events with the highest Claim Event Impact Indices and Claim Event Severity Indices of the employer's claim and the contractor's claim are shown in Table 7-8 and Table 7-9, respectively. Note that the numbers of the relevant sub-clauses are shown in the brackets [].

Table 7-8 Employer's Claim Events with Highest Impact Indices and Severity Indices

Rank	Impact Index		Severity Index	
	Event	Impact Index	Event	Severity Index
1	Claim for Retesting [7.5]	6.05	Claim for Delay Damages [8.7]	7.98
2	Claim for Failure to Remedy Defected Works [7.6]	4.85	a. Claim for Failure for Remediating Defects[11.4]	7.25
3	Injunction	4.44	b. Injunction	
4	Claim for Delay Damages [8.7]	3.50	Repudiated or Frustrated	7.20
5	Claim for Revised Method [8.6]	3.01	Claim for Failure to Remedy Defected Works [7.6]	7.13

Table 7-9 Contractor's Claim Events with Highest Impact Indices and Severity Indices

Rank	Impact Index		Severity Index	
	Event	Impact Index	Event	Severity Index
1	Claim for Delayed Payment [14.8]	8.57	Claim for Delayed Payment [14.8]	8.93
2	Claim for Variations [13.1,7.4,8.4,12.4]	8.45	Claim for Variations [13.1,7.4,8.4,12.4]	8.45
3	Claim for Delayed Drawings or Instructions [1.9]	7.10	Claim for Failure to Give Right to Access to the Site [2.1]	8.03
4	Claim for exceptionally adverse climatic conditions [8.4]	4.34	a. Claim for Errors in Setting Out [4.7]	7.85
5	Claim for Errors in Setting Out [4.7]	3.87	b. Claim for Unforeseeable Physical Conditions [4.12] c. Ex-gratia	

In addition to those with high indices given above, the claim manager shall beware of the events that warn of the claim occurrences, as mentioned a former work. The work of Adrian (1988) was modified for application to the employer's claims. Table 7-10 shows Claim Alarming Events with the documents which can be used to identify them.

Table 7-10 Claim Alarming Events with the Documents Used in Identifying

No.	Claim Alarming Event	Relevant Documents
1.	Vague terms (such as "reasonable", "acceptable", "industrial standard") in contract specifications	a. Specifications
2.	The contractor low tender more than 10% lower than the next lowest bidder.	a. Tender Proposal b. Other Tenderers' Tender Proposal
3.	Drawings prepared by distantly located designers who may not fully know local code requirements	a. Designer's Proposal b. Drawings
4.	Variation in date stated in tender documents for works to start relative to date of notice to proceed	a. Variation Order b. Tender Documents
5.	Employer-supplied material items	General Conditions
6.	Situation requiring new technology or new construction methods	a. Feasibility Study Report b. Notice of Expert's Opinion
7.	Excessive amount of uncertainty and unexpected weather conditions	a. Test Report b. Feasibility Study Report c. Construction Supervisor's Reports d. Contractor's Reports e. Site Diary
8.	Works requiring much interface between several contractors	Project's Master Plan

Table 7-10 Claim Alarming Events with the Documents Used in Identifying (Cont.)

No.	Claim Alarming Event	Relevant Documents
9.	Overly aggressive job site inspectors	a. Minutes of Meetings b. Construction Supervisor's Reports c. Contractor's Report d. Instruction e. Notice of Claim Notification f. Site Diary
10.	Inspectors who like to "direct" versus inspect	a. Minutes of Meetings b. Construction Supervisor's Reports c. Contractor's Report d. Instruction e. Site Diary
11.	Variation orders that do not have a well-defined scope of work	Variation Order
12.	Post-pricing work	Instruction to Use Daywork Basis
13.	Jobs requiring excessive change orders	Tender Documents
14.	Unreasonable number of written or oral inquiries made by contractor regarding interpretation of drawings	a. Notice of Required Drawings or Instruction b. Notice of Defect in Documents
15.	Sudden drop in the number of the contractor's staff at site	a. Construction Supervisor's Reports b. Contractor's Reports c. Site Diary
16.	Oral protests made by the contractor	a. Minutes of Meetings b. Construction Supervisor's Reports c. Site Diary

Table 7-10 Claim Alarming Events with the Documents Used in Identifying (Cont.)

No.	Claim Alarming Event	Relevant Documents
17.	Adverse relationship between the designer and the contractor	a. Minutes of Meetings b. Construction Supervisor's Reports c. Contractor's Reports d. Site Diary
18.	Job site visit by an uninvited attorney	a. Construction Supervisor's Reports b. Site Diary c. Record of Visitors
19.	The contractor suddenly taking detailed records or photographs of works	a. Construction Supervisor's Reports b. Site Diary
20.	Threats of the contractor to stop works	a. Construction Supervisor's Reports b. Notice to Suspend c. Site Diary d. Minutes of Meetings
21.	Awareness of the contractor of the lost money on project	a. Contractor's Reports b. Construction Supervisor's Reports c. Site Diary
22.	Continual changing of contractor's supervisory personnel at job site	a. Construction Supervisor's Reports b. Notice of Replacement of Contractor's Representative c. Site Diary
23.	Unexpected soil conditions	a. Construction Supervisor's Reports b. Site Diary c. Notice of Unforeseeable Physical Conditions
24.	Change of construction method by the contractor	a. Construction Supervisor's Reports b. Site Diary c. Contractor's Reports d. Notice of Proposed Construction Method

Table 7-10 Claim Alarming Events with the Documents Used in Identifying (Cont.)

No.	Claim Alarming Event	Relevant Documents
24. (Cont.)	Change of construction method by the contractor	e. Notice of Change in Construction Method
25.	Change in construction standards during project	a. Notice of Change in Standard b. Journals

2. Use of other techniques for anticipating or identifying claims

Other than close monitoring of the events with high claim indices and the Claim Alarming Events mentioned, claim managers can use additional techniques for anticipating or identifying claims such as those suggested by Callahan (1998):

- a. Hold preconstruction meetings
- b. Hold project meetings
- c. Revise construction scheduling
- d. Evaluate and compare of bids
- e. Perform project cost/ payment forecasting
- f. Regularly review project documentation
- g. Perform proactive problem management at meetings

7.2.3 Claim Notification

To alert a potential problem in a non-adversarial manner within the time limit, the claim manager has to strictly follow the contract provisions related to claim procedures, employ information technology to decrease time of notification, and prepare standard forms necessary in the claim notification process.

Compliance with claim provisions is very important because failure to comply with any contract provision may bar the right to claim of the claimant. The contractor shall notify the engineer of the intention to claim within 28 days after he realizes the occurrence of a claim and shall submit a full report of the claim details within 42 days after the end of the event leading to the right to claim. If the event has continuous effect,

the contractor shall submit monthly interim records. On the other hand, the engineer shall submit the employer's intention to claim against the contractor as soon as is practical. In case the employer wants to claim for an extension of the Defect Notification Period, according to sub-clause 11.3, he must submit the claim notice to the contractor before the end of such period (FIDIC, 1999).

Because contracts always specify a time limit for filing claims or responding to claims, some information technology such as an electronic document management system (EDMS) or electronic data interchange (EDI) may be adopted to reduce communication time as well as facilitate the process. However, such method of communication shall be specified in the Appendix to Tender (FIDIC, 1999).

Standard forms have several advantages. They help claim managers to prepare claim notices within the time limits and with the require data. The important data that need to be addressed into the notice are comprised of the intention to claim, basis of claim, contract provision that giving the right to claim, expected damages of claim, and the supporting details of claim. As to the full report of claim, the claimant shall give full details of claims including the final damages of claim.

7.2.4 Claim Documentation

1. Collection of necessary claim data

From the Claim Data Importance Analysis, 105 pieces of data the claim manager shall pay attention to were classified into four categories, in order to identify the strategy appropriate for collecting of each piece of data: (1) High Importance - High Availability Data, (2) High Importance - Low Availability Data, (3) Low Importance - High Availability Data, and (4) Low Importance - Low Availability Data. The high importance data are the data that have a high level of significance in substantiating liability or quantum of claims or alerting to claim events. In contrast, low importance data are those have low significance in substantiating claims or alerting to claim events. As to the data availability, high availability indicates that the data are normally acquired by the project employer or the engineer while low availability indicates vice versa.

Claim managers shall make efforts to collect the high importance data, especially that with low availability. The low importance - low availability data may be ignored if it requires too much effort to obtain.

Data collection standard forms may be prepared in order to facilitate the claim document process and solve the problems concerning data incompleteness. In addition, some claim managers may decide to use alternative technologies such as camera, video camera recorder, and time-lapse photography, to collect necessary data. A computer is one of a powerful assistant in collecting, storing, and retrieving of the claim data.

2. Documents necessary in the claim management process

Not only documents necessary to be prepared according to the standard construction contract, the consultant agreement, and the rules of arbitration, but also fourteen groups of documents containing data not contained in the mandatory documents shall be kept in order to enhance availability of all claim data. Table 5-3 shows those groups of documents.

Furthermore, claim managers shall give attention to the documents with a high level of importance to the claim management process, which can be seen from their high Claim Document Importance Indices. From 232 groups of documents (393 documents), there are 83 groups of documents (164 documents) found to have such high importance. Table 5-4 shows the top ten groups of documents that have the highest level of importance.

The full list of all documents flowing in an international construction project, according to the provisions of the three selected standard documents, is in Appendix B.

7.2.5 Claim Analysis

In analysis of a claim, the analyst shall follow two steps: claim liability analysis and claim quantum analysis. The claim quantum analysis is further divided into analysis of time and analysis of additional payment.

To analyze the claim liabilities, the analyst has to compare the facts and the contract provisions or laws leading to the rights to claim. Establishing an effective claim documentation system will facilitate the analysis. As to the claim quantum analysis,

Table 3-3 and Table 3-4 presented the calculation methods of both employer's claims and contractor's claims, respectively.

As to the analysis of liabilities and damages of claims for extension of times, the Contemporaneous Period Analysis Technique (CPA) (Alkass and Harris, 1991; Al-Saggaf, 1998; Levin, 1998) was recommended. This technique has the advantage of a properly updated CPM schedule. Details of CPA technique were described in Section 2.2.4 [Claim Analysis].

7.2.6 Claim Preparation

After acquiring of all necessary information, the claim report shall be prepared for submission to the other party. This process shall comply with the relevant contract provisions, especially those concerning the time limitation, claim procedure, required data, and required documents. In addition, there are several factors the claim manager and the employer shall take into account when they have to make decisions about whether claim notices shall be issued: opportunity to get compensation, amount of compensation, deteriorated work atmosphere, increased document work, organization policies, and deteriorated relationships.

Claim reports shall contain all necessary information such as the full details of the claims, basis of the claims as well as the number of the relevant clauses, substantiation of the claim quantum, and any supporting documents. Pre-setting of the claim report will help facilitate this process.

7.2.7 Claim Negotiation

Claim negotiation is another important stage aimed at finding solutions to claims. In order to achieve this goal, all parties must prepare themselves well. Recommendations from Kululanga (1989) suggest what shall be considered in this situation. The claim manager shall make sure that all information is current and complete. He may need to minimize the scope beforehand in order to avoid allowing small topics to bar the bigger and more necessary topics from being solved. This can be done by presetting the meeting agenda, analyzing importance of each topic, and informally discussing the issues with the relevant parties before the meeting. A good

negotiator will foresee problems, anticipate the opposition's next move, and utilize the other party's weak points by conceding them in return.

The proposed employer's claim management system differs from the former work because it helps employers manage all major types of their construction claims in all sub-processes of claim management by employing the information-oriented approach, of which the supporting concepts can be systematically explained by the facts and relationships among claim events, claim components, and claim data. Furthermore, the research also presented the supporting guidelines, which prepare the work environment for the proposed claim management system to work efficiently.

7.3 Implementation of the Proposed System

In order to implement the proposed claim management system, the following tasks shall be performed:

1. Ensuring that all claim data will be available

All 105 necessary pieces of claim data shall be available to the claim manager. List of all data can be found in Table 4-2. This can be assured by direct checking the availability of data or by checking whether all of the fourteen Recommended Additional Documents shown in Table 5-2 are available in the project. The last method is suitable with the projects that use FIDIC standard documents.

2. Ensuring that all important events occurring in project will be reported

Because the proposed method to identify claims is to pay attention to the events that have high Claim Event Frequency Index, Claim Event Severity Index, Claim Event Impact Index, and to Claim Alarming Events, records about the events occurring in the project are very important. The documents containing such records are consultant's daily/ weekly/ monthly reports, contractor's daily/ weekly/ monthly (progressive) reports, minutes of meetings, etc.

3. Educating or providing consulting services

The project staff such as employer staff, project director, project manager, project engineers, and engineers shall be educated. Examples of the important topics

they must know are construction process, contract management, claim management, and the details of the proposed system. In case the educating approach seems to be inappropriate or unpractical, consulting services from qualified consultants may be provided instead.

4. Implementation of related systems

In order to enhance the efficiency of claim management processes, other systems such as procurement, contract management, dispute resolution, and construction management shall be concurrently implemented.

5. Revising of regulations and contract provisions

Contract provisions, regulations, organizational policies, consultant agreement provisions, and standard forms used in a construction project shall be reviewed and any obstruction of a good claim management system shall be revised.

6. Tuning parties' attitudes and ethics.

Good attitudes and ethics contribute to success in the implementation of the claim management system. In contrast, negative attitudes or lack of ethics can lead to its failure. The implementation of claim management system is sometimes looked unfriendly by the other contract party or the third party mainly because of its misunderstanding of the concept. Claims shall be looked as a tool of fairness which can occur in every project. The importance of effective claim management as well as contract management shall be realized. Corruption is dangerous to the industry and shall be avoided. The contract shall be fair to all parties concerned and the contractor shall bear suitable risks and responsibilities. Finally, the engineer shall be looked as an independent professional party, not the full-time employee of the employer.

7.4 Verification of the Research Results

7.4.1 Description

To verify the correctness, reliability, and usefulness of the research results, a seminar about the employer's claim management system was held in the following steps:

1. Invitation letters were submitted to the 144 qualified people from eighteen public organizations, eighteen consulting companies, ten project developer companies, one contractor company, twenty universities, and five organizations that were related to construction: the Council of Engineers, the Engineering Institute of Thailand, the Consulting Engineers Association of Thailand, the Thai Contractors Association, and the Arbitration Office (Ministry of Justice). Furthermore, the announcement was made nationwide via the website of the Council of Engineers in order to invite people who were interested in claim management.

2. Another set of questionnaires were prepared. There were three main parts in the questionnaires. The first part was designed to collect the respondents' personal information such as their names, workplaces, number of years of claim management responsibilities, and the maximum contract values of the projects in which they have claim management experience, similar to the other sets of questionnaires used in the former phases. The second part contained fifteen items that were used for verifying fifteen research results. In each item, the respondents were asked to assess the correctness, reliability, usefulness of each research result by filling the numbers "0" to "4" in three blanks. The number "0" represented the minimum level of correctness, reliability, and usefulness, as the case may be. On the other hand, the number "4" indicated the maximum level of correctness, reliability, and usefulness. The respondents were also able to add any comment, or suggestion to each research result in the space provided. The final part of questionnaire was an open-ended question asking for additional information, comments, or suggestions (if any).

3. In the seminar, after the presentation about research background, objectives, methodology, and findings, the participants were asked to fill in the questionnaires. In addition, the participants were also invited to ask questions, share their experiences or problems found in managing claims, and give comments or suggestions during the seminar.

4. The data gathered from questionnaires were analyzed and conclusions made.

There were 36 people who participate in the seminar. However, some did not return the questionnaires and some did not have sufficient experience managing construction claims in a project with contract value of more than 20 million baht, which

was used to filter out the unqualified participants. The 20 million baht was converted from the value of \$500,000 suggested by FIDIC to justify the use of the *Conditions of Contract for Construction (First Edition)* (Booen, 1999).

Table 7-11 Numbers of Participants Classified by their Types of Organizations

Type of Organization	Number of Participants	
	Qualified	Total
1. Public Organization	7	7
2. Consultant Company	7	9
3. Project Developer	2	2
4. University	0	14
5. Other Construction Professional Organizations	2	2
Total	18	34

Table 7-11 and Table 7-12 show the number of participants classified by their types of organization and their fields of expertise, respectively. It can be clearly noticed that the majority of participants were from the employers' organizations and almost all of them had engineering expertise.

Table 7-12 Participants Classified by Their Field of Expertise

Field of Expertise	Number of Participants (Persons)
1. Engineer	14
2. Lawyer	2
3. Other	2
Total	18

7.4.2 Correctness, Reliability, Usefulness and Comments of the Research Outputs

There were several comments about the research which were collected from the seminar participants, and which can be divided into several groups according to the research topic they address: Employer's Claim Cost Components, Claim Data Importance Index, problems of existing claim management systems, Guidelines for Improving Claim Management Efficiency, and other comments.

1. Employer's claim cost components
 - a. The method of calculation should be expressly specified in the contract.
 - b. The presented cost components were reasonable and useful.
2. Claim Data Importance Index
 - a. Claim data with low importance (Group C and D) are also important, particularly in the public projects.
3. Problems of Existing Claim Management System
 - a. In public sectors, there are regulations and contract provisions governing the construction claim process. The problems always occur from poor document preparation and ignorance of the contract review by the contractors.
4. Guidelines of Improving the Efficiency of the Existing Claim Management System
 - a. One way to enhance claim management efficiency is to support use of the fair international standard forms of contract. For this purpose, the "*Conditions of Contract for Construction (First Edition)*" prepared by Fédération Internationale des Ingénieurs-Conseils (FIDIC) in 1999 should be translated into Thai and published.
5. Others
 - a. This research should be published in order to educate the project staff of both private and public sectors and to stimulate the academics to perform more research work in this field. One respondent who is a staff of the Council of Engineers suggested asking for promotion from The Council of Engineers.
 - b. Statistical methods should be used in verifying the research results.

c. Claim management is the western-styled construction management technique, which is necessary for the country in the future. Thai engineers should pay more attention to claim management while the employers should look at claim management as a normal process of contract management.

d. Attitudes and Ethics are very important, especially for public employers.

Note that brief details of each research result will be summarized in Chapter 9 [Summary, Conclusion and Recommendation]. In addition, the correctness score, reliability score, and usefulness score of each result acquired from this research is shown in Table 7-13.

Table 7-13 Correctness, Reliability, and Usefulness of the Research Outputs

Research Outputs	Correctness	Reliability	Usefulness
1. Employer's claim cost components	3.25	3.00	3.07
2. List of claim data	3.18	3.12	3.29
3. Claim Data Importance Index	3.06	2.89	3.19
4. Claim Data Availability Index	3.06	3.06	3.40
5. Claim Event Frequency Index	3.00	2.88	3.12
6. Claim Event Severity Index	2.79	2.92	3.00
7. Claim Event Impact Index	3.20	3.14	3.00
8. Details of Existing Claim Management System	3.16	2.84	2.71
9. Efficiency of Existing Claim Management System	2.89	2.94	2.80
10. Problems of Existing Claim Management System	3.33	3.28	3.31
11. Causes of the Problems of Existing Claim Management System	3.37	3.26	3.12
12. List of Claim Documents	3.00	3.00	3.23
13. Claim Document Importance Index	3.35	3.19	3.35

Table 7-13 Correctness, Reliability, and Usefulness of the Research Outputs (Cont.)

Research Outputs	Correctness	Reliability	Usefulness
14. Proposed Claim Management System	3.26	3.16	3.37
15. Guidelines of Improving the Efficiency of the Existing Claim Management System	3.26	2.95	3.22

From Table 7-13, it was found that the participants were satisfied with the correctness, reliability, and usefulness of all research results, as seen from their statistical indices of higher than 2.50 and some comments from the participants.

In addition, data from this seminar can also be used to recommend further methods for enhancing claim management efficiency such as expressly specifying the agreed methods of calculation in the contract, paying attention to all types of claim data, and translating and publishing the Thai language international standard form of contracts.

7.5 Summary

In this chapter, an effective model of the employer's claim management system was designed by considering all relevant design information: (1) problems and recommendations collected from the former steps, (2) results from former analyses, and (3) findings from reviewing related former literature that can solve the problems or improve claim management efficiency. The model was designed as an overall system with the separate claim management sub-processes: claim identification, claim notification, claim documentation, claim analysis, claim preparation, and claim negotiation. At the end of the chapter, the guidelines for implementation of the proposed claim management system were described and the acquired research results were verified by an expert seminar.

To have claims managed timely and continuously, there should be a person who is directly responsible for handling claim functions. Well-prepared standard provisions

of standard forms of contracts can decrease problems. Furthermore, information technology must be implemented in the organization in order to enhance effective communication, both internal and inter-organizational communication. The proposed information system consists of several sub-processes: claim input unit, claim management information system (MIS), or other special-purpose claim information systems such as claim decision support system (DSS), claim executive support system (ESS), or claim expert system (ES).

Claims can be well identified by paying a high level of attention to the events that have a high level of impact and severity to the project and those recommended in other research as the events that alarm parties of claim occurrences (Adrian, 1988). The examples of such events are failures to pass a Test on Completion, failures to remedy defects, delays, and the presence of vague terms in the contract. In addition, some techniques such as holding meetings, reviewing construction scheduling and project documents, and evaluating and comparing bids can be used to identify claims (Callahan, 1998).

Notification of claims to the other party is an important obligation in the construction contract. According to the *Conditions of Contract for Construction (First Edition)*, the contractor shall notify the employer or the engineer within 28 days after he knows or shall know his rights to claim while the engineer, on behalf of the employer, shall notify the contractor as soon as practicable. Information technology shall expedite the notification process, but its use will be limited only in projects with agreement from both parties. Not only information technology, but also the use of standard forms can increase the efficiency of the process.

Records are absolutely necessary in claim management. There are 105 pieces of data, contained in 143 groups of documents (264 total documents), that are necessary for analyzing, preparing, substantiating, and settling claims. The examples of data with high Claim Data Importance Indices are details of documents received, details of contract provisions, and details of payment. As to the documents, claim managers shall give attention to the documents with high levels of importance for the claim management process. From the 143 groups of documents (264 documents), there are 83 groups of documents (164 documents) found to have such high importance (i.e.,

consultants' reports, minutes of meetings, and experts' reports). In addition, fourteen groups of documents containing data not contained in the mandatory documents shall be documented such as records of employer's equipment costs, records of employer's financial transactions, and notices of contractors' cost of capital.

In the analysis process, the claim manager has to find the claim liability and claim quantum, which is further divided into time quantum and cost quantum. International approaches in substantiation or calculation of these items shall be adopted. Some items have more than one method of calculation, but the analyst has to deliberately select the appropriate approach by taking account of its advantages, disadvantages, the purposes of use, and constraints (if any). Contemporaneous Period Analysis Technique (CPA) (Alkass and Harris, 1991; Al-Saggaf, 1998; Levin, 1998) was recommended for the analysis of liability and quantum of claim for extension of time because of its properly updated CPM schedule. Calculation methods for both employer's claims and contractor's claims are shown in Table 3-3 and Table 3-4, respectively.

Next, a full report of claims shall be prepared according to the contract provisions. This process shall comply with the relevant contract provisions, especially those concerned with the time limitation, claim procedure, required data, and required documents. According to FIDIC (1999), the contractor shall submit the full details of claim events within 42 days after the end of such events. Monthly interim claim reports are also necessary for the events that have continuous effects. Besides contract provisions, there are several factors the claim manager and the employer shall take into account when he has to make a decision about whether claims shall be filed: opportunity to get compensation, amount of compensation, deteriorated work atmosphere, increased document work, organization policy, and deteriorated relationship. Claim reports shall contain all necessary information such as the full details of claims, bases of the claims as well as the number of the relevant clause, substantiation of the claim damages, and any supporting documents. Pre-setting the format of the reports also facilitates this claim preparation process.

Claim negotiation, is another important stage that aims at finding the solutions to claims. In order to be successful in negotiation about claims, sufficient preparation is

very important. Techniques suggested by previous research can help claim managers in these situations (Kululanga, 1989). Claim managers shall make sure that all information is current and complete. They may need to minimize scopes beforehand in order to avoid allowing small topics to bar bigger and more important topics from being solved. This can be done by presetting the meeting agenda, analyzing each topic's importance, and informally discussing issues with the relevant parties before meetings. A good negotiator shall foresee problems, anticipate the opposition's next move, and utilize the party's weak points by conceding them in return.

The proposed claim management system discussed in this chapter can help construction project employers manage their claims efficiently. Thus, they will have greater opportunities to achieve the goals of construction project procurements: to complete the construction work on time, with good quality, and within the budget. However, there are some tasks that must be performed before implementation of the system: (1) ensure that all the claim data will be available, (2) ensure that all important events occurring in project will be reported, (3) educate or provide consulting services, (4) implement related systems, (5) revise regulations and contract provisions, and (6) tune parties' attitudes and ethics.

The results of the expert seminar revealed that no participant was seriously dissatisfied with the correctness, reliability, and usefulness of the research results. In addition, there was no comment concerning error in the research results. These facts support the correctness, reliability, and usefulness of the research results in a certain level. In addition, the feasibility of the implementation of the proposed system in real-world construction projects was also examined. The details as well as the results of the study will be presented in the next chapter.

CHAPTER VIII
APPLICATION OF THE PROPOSED SYSTEM:
SUVARNABHUMI AIRPORT CASE STUDY

8.1 Description

In order to ascertain the feasibility and to illustrate guidelines for the implementation of the proposed system designed in Chapter 7 [Proposed Construction Claim Management System] in real-world projects, an international construction project was selected as the case study. For this reason, the Suvarnabhumi Airport Project was selected because of its internationality, large scale, and FIDIC (1999) application. In this research, the case study project was analyzed in various aspects: organization structure, information system, related laws and regulations, claim management techniques, etc., in order to find its feasibility and implementation guidelines.

Five key staff members from the Airports of Thailand Public Company Limited (AOT), two from Project Management Consultant (PMC) staff members, and one of Construction Supervision Consultant (CSC) companies were interviewed. Table 8-1 shows the questions used in the interviews. In addition, some analysis, such as analysis of organization structure, information systems, cost and benefit of implementation, and availability of claim data, were also performed. The results from the interviews and the analyses were used to determine the feasibility of implementing the proposed employer's claim management system in the Suvarnabhumi Airport Project.

Table 8-1 Questions in Analyzing the System Implementation in the Case Study

No.	Question	Interviewee			Remark
		AOT	PMC	CSC	
1.	Questions related to the organization structure				

Table 8-1 Questions in Analyzing the System Implementation in the Case Study (Cont.)

No.	Question	Interviewee			Remark
		AOT	PMC	CSC	
a.	How is your organization structure?	✓	✗	✗	Ask for Organization Chart
b.	What are the advantages/ disadvantages/ problems of the existing organization structure?	✓	✓	✓	
c.	Do you agree that there should be a person/ persons direct responsible to claim management functions? Why? What are the advantages/ disadvantages of this arrangement?	✓	✓	✓	
d.	What part in the organization chart that the claim engineer/ claim department (as case may be) should be located?	✓	✓	✓	
e.	Do you agree with the proposed claim management organization structure?	✓	✓	✓	Present the proposed organization structure
2.	Questions concerning information system in the organization				
a.	In your organization, which claim functions are computerized? a) Claim identification b) Communication c) Data storage	✓	✓	✗	

Table 8-1 Questions in Analyzing the System Implementation in the Case Study (Cont.)

No.	Question	Interviewee			Remark
		AOT	PMC	CSC	
	d) Data analysis e) Document preparation f) Presentation				
b.	In your opinion, does your organization have sufficient computer usage? Is there any claim related task that should be computerized?	✓	✓	✓	
c.	Do you agree with allowing each party files claims by using e-mails?	✓	✓	✓	
d.	What is the policy of your organization concerning information system?	✓	✓	✗	
e.	What is your opinion concerning the proposed claim management information system?	✓	✓	✗	Present about the proposed claim management information system
f.	Is the proposed claim management system feasible for implementation in your organization? Why?	✓	✓	✗	
3.	Questions concerning laws and regulations				
a.	Is there law or regulation concerning claim engineer nomination or claim department foundation?	✓	✗	✗	
b.	Is there law or regulation obstructing claim engineer nomination or claim department foundation?	✓	✗	✗	

Table 8-1 Questions in Analyzing the System Implementation in the Case Study (Cont.)

No.	Question	Interviewee			Remark
		AOT	PMC	CSC	
4.	Questions concerning claim management				
a.	In Suvarnabhumi Airport Project, is there any quality manual concerning claim management process?	✓	✓	✓	Ask for quality manual
b.	Please describe the active claim processes (against the contractor) in case of (1) delay, (2) quality of works, and (3) defect liability period	✓	✓	✓	
c.	Please describe the defensive claim processes (be claimed by the contractor) in case of (1) change, (2) delayed site access, and (3) disruption by other contractors	✓	✓	✓	
d.	Problems or suggestions concerning the existing claim management system	✓	✓	✓	
e.	How do you receive these claim data?	✓	✓	✓	Ask for answering questionnaire (Appendix A)
f.	Does your organization have the standard form used for claim purposes? (RFI, SI, VO, RFC, etc.)	✓	✓	✓	Ask for standard forms
g.	Have you found problem in claim process? What?	✓	✓	✓	
5.	Other Questions				

Table 8-1 Questions in Analyzing the System Implementation in the Case Study (Cont.)

No.	Question	Interviewee			Remark
		AOT	PMC	CSC	
a.	Does your organization have budget constraint?	✓	✗	✗	
b.	What is the policy of your organization concerning claim or relationship with the other parties?	✓	✗	✗	
c.	How much is the suitable claim consultant fee?	✓	✓	✓	

8.2 Suvarnabhumi Airport Project

Suvarnabhumi Airport is the second international airport of Thailand. It is aimed at promoting and contributing to the development of the country's economy, society, tourism and other aspects. It covers an approximate area of 3,100,000 square meters. Located at Km.15 on the east-bound Bangna-Trat Highway in Bang Phi District, Samut Prakarn Province, about 25 km. from Bangkok's downtown. The annual passenger capacity designed for is 45 million during the opening year, but 100 million upon full development. By comparing capacities, Suvarnabhumi Airport would be ranked as the fourteenth largest airport of the world.

As to the construction works, there are several facilities in the project such as a 7-storey passenger terminal with two underground floors, two parallel runways (four runways at its ultimate development), the tallest control tower in the world, two aircraft maintenance facilities, cargo terminals, a 600-room landside hotel, etc. (AOT, 2006a).

8.3 The Existing Systems of the Suvarnabhumi Airport Project

8.3.1 Organization Structure

There are several parties related to the construction work in the Suvarnabhumi Airport Project. The main parties consist of: (1) Airports of Thailand Public Company

Limited (AOT) as the employer, (2) ITO Joint Venture as the main contractor, (3) Project Management Consultant (PMC), and (4) several Construction Supervision Consultant (CSC) companies responsible for supervision of the construction works. The relationships between each party in Suvarnabhumi Airport Project are shown in Figure 8-1.

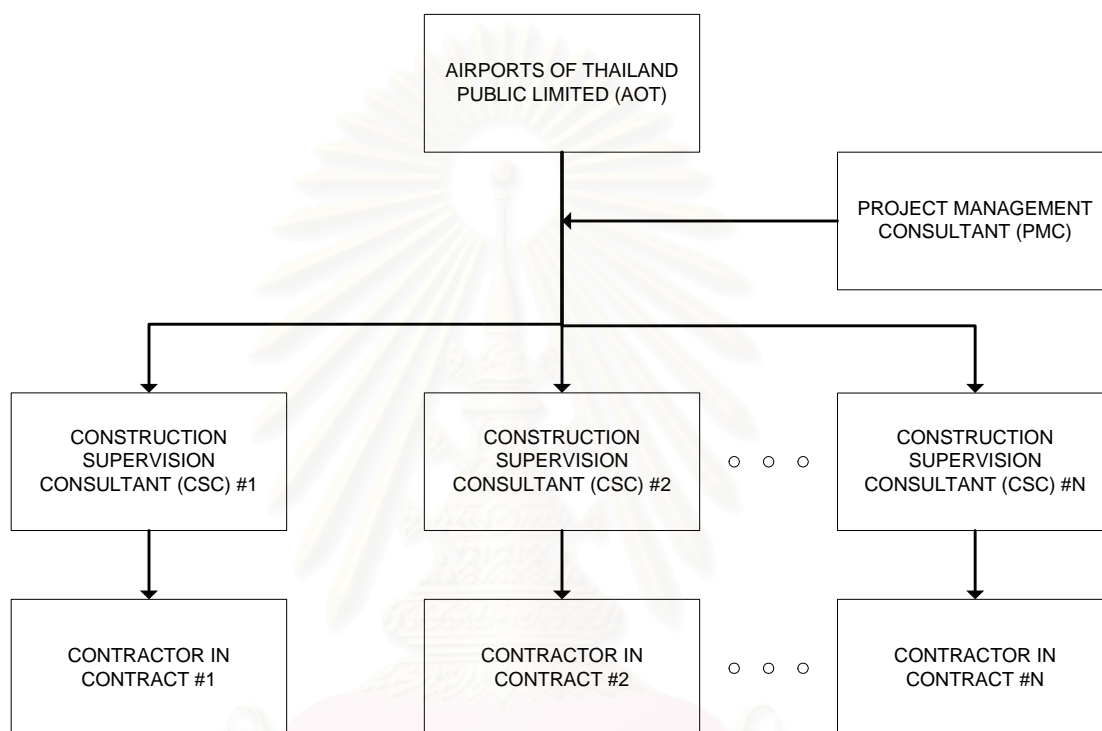


Figure 8-1 Parties in Suvarnabhumi Airport Construction Project

The interview results revealed that AOT employed several CSC's to supervise the performance of the contractors in every contract. Each CSC was responsible for supervising the construction process and giving comments to AOT for making decisions such as making payments, analyzing claims, etc. Because of the lack of experience in procurement of a large modern airport mega-project like Suvarnabhumi Airport, AOT employed PMC for project planning, management of overall project design, procurement, and construction processes and giving comments to AOT regarding performance of its obligations. PMC did not have rights to directly issue instruction to CSC's. CSC's would perform their services until one month after their responsible works

would be taken-over by AOT while PMC would be in the project until three months after the airport is opened.

As to the AOT organization structure, construction works in Suvarnabhumi Airport Project were divided into of four departments: Project Supporting Department, Project Management Department, Project Construction Department, and Project Coordination Department, as shown in Figure 8-2. Note that the Project Construction Department is further divided into four parts, according to their responsibilities for types of construction work. The Construction 1 Division handles civil work while the Construction 2 Division, Construction 3 Division, and Construction 4 Division handle architecture work, mechanical and electrical work, and information technology devices, respectively. As to the Project Supporting Department, Contract Administration Division is responsible for preparing contracts and also monitoring the project to be complied with contracts. These responsibilities are concerned with both project procurement tasks and law and regulation advisory tasks. For this reason, there are several in-house legal staff members working in this division.

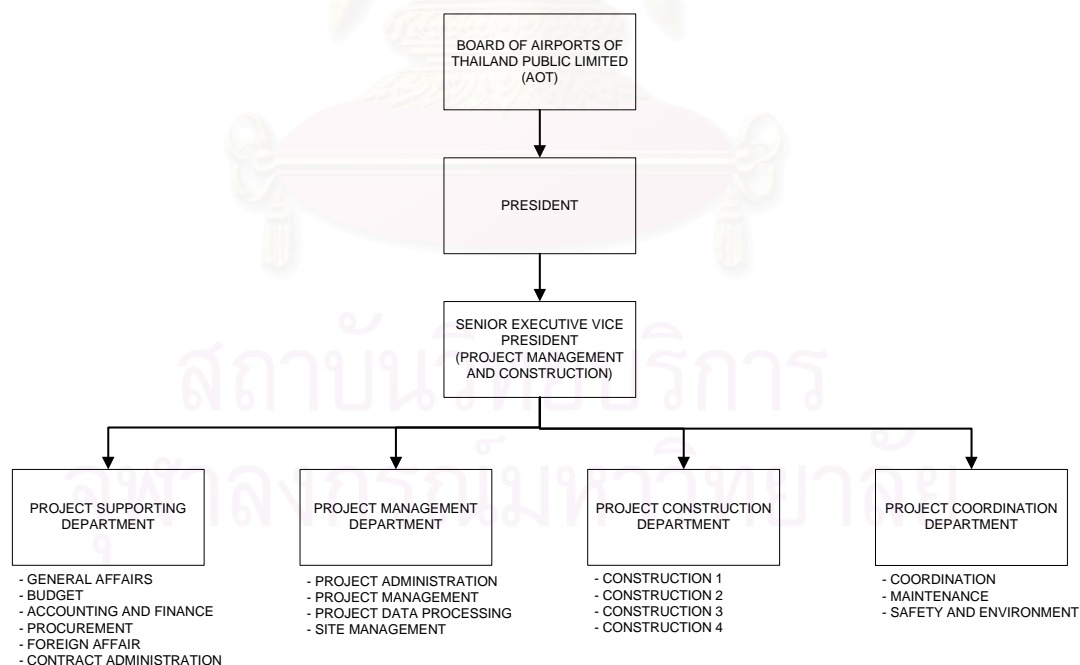


Figure 8-2 Internal Organization Structure of AOT
(Project Management and Construction)

8.3.2 Problems of and Suggested Solutions for the Existing System

From interviews and analyses, various problems and suggestions were collected. Those concerned with the existing claim management in the Suvarnabhumi Airport construction project were placed into several groups, as shown in Figure 8-3.

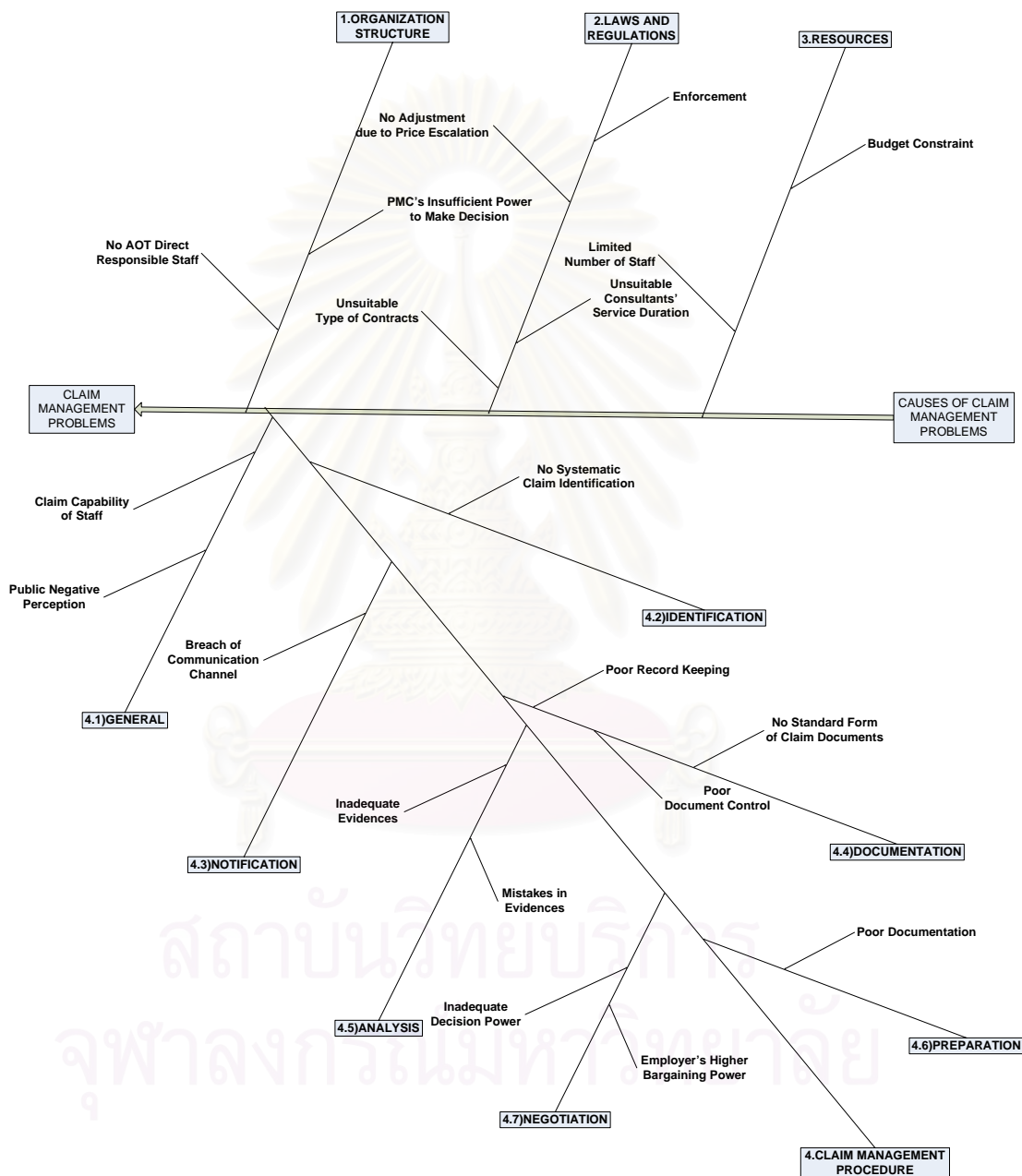


Figure 8-3 Problems in Construction Claim Management of Suvarnabhumi Project

1. Organization Structure

Some interviewees revealed that the existing organization structure had problems in several respects. First, there was no AOT authorized staff who was directly responsible for managing construction claims. The work inspection committees could not be appropriate claim managers for several reasons. They had to be responsible for too many duties related to their work packages to pay close attention to claims. Furthermore, the committees focused on only their responsible packages, which could not enhance consistency and integrity in claim management. As to the Contract Administration Division, it acted like the advisor of the claim management process, not a directly responsible entity. In addition, its staff members did not have engineering backgrounds and had to handle both procurement and legal duties at the same time. Therefore, it may not have been able to manage construction claims efficiently.

The second problem found in the project was caused by the supporting roles of PMC. It had no power to make decision or instruct the CSC and the contractors and had to wait for approvals from AOT. This may have caused disruption to the construction process.

2. Laws and Regulations

The design-bid-build form of construction contracts seems to have caused a large number of claims in this project. An airport involves an abundance of interrelated components. This caused difficulties to PMC and AOT in coordinating the many designers and contractors, especially in projects that were subjected to several suspensions and revisions. One interviewee revealed that his former airport construction projects had normally used the other forms of contract such as Engineering Procurement and Construction (EPC) contracts or turnkey contracts.

The duration of the consultants' services specified in agreements between AOT and its consultants (PMC and CSC's) may have led to problems. Several contractual events occurred after project taking-over such as final payment, warranty, dispute resolution and claims. Without PMC and CSC services, AOT may have been in a difficult situation. For example, claims and disputes settlement required well-prepared evidence and specialized management.

Another problem which might have occurred in the claim management of this project concerned price escalation. Price adjustment due to price escalation was not allowed in this project; in other words, there was no price escalation provision in the contract. This situation may have caused claim problems for the project because, in such a long-term project which is full of uncertainties like this one, contractors have to try to find sources of profit or, at least, compensation. One such source is construction claims.

The final problem found was the enforcement of regulations and contract provisions. The enforcement was sometimes not strict. For example, occasionally, work inspection committee members did not properly enforce the contract provisions because they thought the provisions in the contract were similar to those they had experienced in the past, so they did not deliberately review the contract provisions.

3. Resources

There were two problems concerning project resources: limited numbers of staff and budget constraints.

Because construction was not a major activity of AOT, there are only twenty to thirty staff members. This number was very small compared with the more than 100,000 activities needed to be performed in the project.

The interview responses showed that payments to contractors due to construction claims were not included in the budget submitted by the cabinet in 1998. For this reason, such payments had to be delayed because AOT had to request additional budgets for making payments to the contractors due to claims to which the contractors were entitled.

4. Claim Management Procedure

As to claim management techniques, the problems that were found can be divided into seven groups consisting of problems concerning general claim management system, claim identification, claim notification, claim documentation, claim analysis, claim preparation, and claim negotiation.

Concerning general problems with the claim management system of the Suvarnabhumi Airport construction project, the first problem was the result of misunderstandings about claim management concepts by external entities such as

independent organization staff and government members. Some people viewed claims as a sign of poor management or corruption. If claim management is a priority in a project, the project may be assumed to have troubles in the future. This caused AOT to try to avoid being involved with claim management activities. Such a situation does not enhance effective claim management, which requires a high level of attention.

As to the capacities of the parties involved in the claim management process, the work inspection committees, or an Employer's Representative, seem to have had limited capabilities in claim management because their expertise was in construction supervision, not a special field requiring multidiscipline capability like claim management. Another party that should be mentioned is the CSC. Because there were a lot of CSC's in the project, their capabilities in claim management seemed to be various. Some had good claim management systems while some were insufficient.

Analysis of the existing claim management procedure found that there was no systematic claim identification process. Claim identification capability depends on the knowledge and skills of work inspection committees (who may have had no direct expertise in claim management), and PMC and CSC (who sometimes may have had no power to make decisions).

The problem found in the claim notification process was that, sometimes, contractors did not comply with the provisions concerning channels of communication, which specified that contractors shall submit notice, documents to their CSC.

Claim documentation in this project could have been improved. First, the project staff should have paid more attention to keeping complete and timely records. Second, there was no standard form for some routine documents such as Notice of Claim Notification and claim proposal, which may have caused incomplete data and delayed decision problems. Final problem concerned the project document control; AOT staff members found difficulties in finding documents, which showed the need for a more effective document control system.

Some problems were found in performing analysis of claims for variation orders, the main type of claims in the project. As to analysis of claims for variation, it was found that CSC sometimes submitted inadequate evidence involving price quoting from

suppliers and the frequent mistakes concerned overhead and profit mark-up, tax, standard method of measurement (SMM), temporary works, etc.

The problem in claim preparation was due to poor documentation. Documents concerning claims should be timely, well prepared, and complete enough to be evidence in arbitration or litigation processes. The interviews determined that this point was always ignored and the quality of documents was not given the attention as it deserved.

The last group of problems found from the interviews, claim negotiation problems, consisted of two problems: power to make decisions, and the employer's higher leverage. All of the employers' representatives who attended a site meeting: work inspection committee, PMC representative, and CSC Representative had limited power to make decisions. In case an issue was out of their powers, such issue had to wait for a decision made by AOT management, which may have caused damages to the project. In the negotiation process, the employer seemed to have had much greater bargaining power than his contractors and also his consultants. Contractors and consultants sometimes followed the employer's decisions, even though they agreed that they or the contractors (as case may be) should have been entitled to compensation.

8.4 Guidelines to Implement the Proposed System

8.4.1 Preparation for system implementation

1. Ensuring that all of claim data will be available

From results acquired from questionnaires SA and SB, almost all claim data are available in the project, except five pieces of data that are shown in Table 8-2.

Table 8-2 Missing Claim Data in Suvarnabhumi Airport Construction Project

Missing Claim Data	Related Claim Component	Related Document	Remark
1. Employer's Free-Issue Material Sent to the Contractor	a. Additional Employer's Free-Issue Material Quantity	a. Delivery Order of Employer's Free-Issue Material	No Employer's Free-Issue Material in the Project

Table 8-2 Missing Claim Data in Suvarnabhumi Airport Construction Project (Cont.)

Missing Claim Data	Related Claim Component	Related Document	Remark
1. Employer's Free-Issue Material Sent to the Contractor (Cont.)	b. Additional Employer's Free-Issue Material Unit Price	b. Consultant's Reports c. Site Diary d. Minutes of Meetings	
2. Employer's Equipment Actual Hour	a. Cost for Employer's Owned-Equipment Use b. Cost for Increased Employer's Owned-Equipment Rates	a. Progress Report b. Consultant's Reports c. Site Diary d. Minutes of Meeting e. Employer's Equipment Utilization Report f. Daily Employer's Equipment Time Report g. Contractor's Reports	No Employer's Equipment in the Project
3. Employer's Equipment Hourly Operating Cost	a. Cost for Employer's Owned-Equipment Use b. Cost for Increased Employer's Owned-Equipment Rates	Record of Equipment Cost from Employer	No Employer's Equipment in the Project

Table 8-2 Missing Claim Data in Suvarnabhumi Airport Construction Project (Cont.)

Missing Claim Data	Related Claim Component	Related Document	Remark
4. Employer's Equipment Hourly Ownership Cost	a. Cost for Employer's Owned-Equipment Use b. Cost for Increased Employer's Owned-Equipment Rates	Record of Equipment Cost from Employer	No Employer's Equipment in the Project
5. Contractor's Cost of Capital	Interest or Finance Costs	Contractor's Cost of Capital	

It should be noted that because there was no agreement to supply Employer's Free-Issue Material or Employer's Equipment according to sub-clause 4.20[Employer's Equipment and Free-Issue material], all respondents replied that (1) Employer's Free-Issue Material Sent to the Contractor, (2) Employer's Equipment Actual Hour, (3) Employer's Equipment Hourly Operating Cost, and (4) Employer's Equipment Hourly Ownership Cost were not available. However, when the related documents of each claim data mentioned above were considered, it was found that they would be easily collected. Therefore, these four data were available to the normal projects for which the employer had such obligations.

The actually unavailable data to the existing system of Suvarnabhumi Airport construction project was only the Contractor's Cost of Capital. This data is necessary to substantiate the contractor's claims for interest or finance costs due to the employer's caused delay. This data can be acquired by asking for it from the contractor during the pre-qualification or tendering processes or by pre-determining it in the contract.

2. Ensuring that all important events occurring in project will be reported

The reporting system in the Suvarnabhumi Airport construction project was good enough to ensure that all important events occurring in the project would be reported to

the claim manager. However, interview results showed that the document control system should have been improved in order to reduce the time needed to search for required information.

3. Educating or providing consulting services

In the Project Management and Construction Office, there were several qualified staff members working in various divisions: project management, construction, data processing, contract administration, legal affairs, budget, etc. Moreover, AOT also employed PMC, which had professional airport claim experts, to provide consulting services. Therefore, this organization had potential in this aspect.

However, in order to facilitate the implementation process and to increase the system's efficiency, claim management and details of the proposed claim management system were the topics that needed to be taught to the staff members as well as CSC's staff before implementing of the proposed system. Finally, project staff members should also have been trained how to effectively perform documentation works.

4. Implementation of related systems

From interviews, there are several systems that support the claim management function of the claim management system and should be prepared before implementation of the proposed system. They are:

a. Project Management System

In order to facilitate the claim management function, the project organization of AOT would have been rearranged. Figure 8-4 shows the proposed organization structure for AOT in the Suvarnabhumi Airport construction project. There should have been a claim management team consisting of a group of claim engineers who were well-trained about claim management. Each member of this team would be a member of one or a certain number of work inspection committee(s). This member would be responsible for handling claim management functions in part of AOT. The main responsibilities of this team would be:

- 1) Identify claims and notify the chairman of work inspection committee as soon as possible.
- 2) Register claims and prepare files of claim details.
- 3) Coordinate among related parties to collect necessary claim data.

- 4) Perform claim analysis and give comments to the chairman of the work inspection committee.
- 5) Prepare drafts of claim notices, claim proposals, correspondences concerning claims for the chairman of work inspection committee.

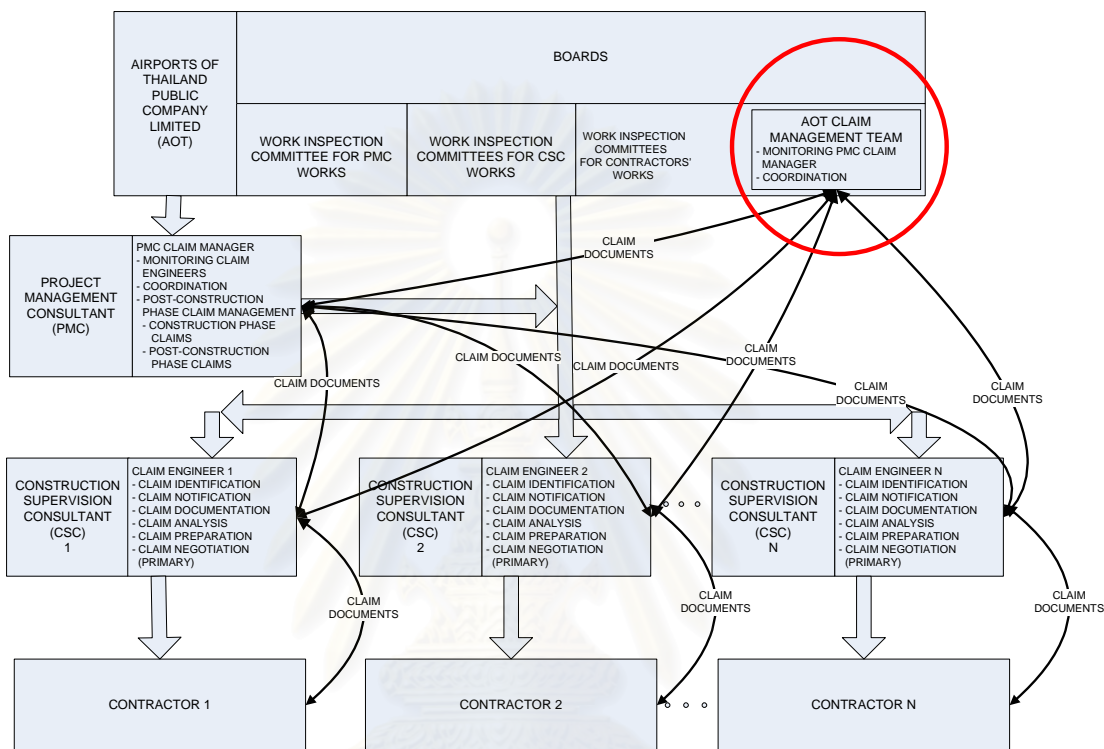


Figure 8-4 Proposed Organization Structure for AOT

Under this structure, PMC would become the real supporting party in the claim management function. The Project Procedure should have been revised by stating rights, responsibilities, and work procedures of the claim management team staff and others in the new arrangement and should have been understood by all relevant staff. This structure has several advantages but has a few disadvantages, as shown in Table 8-3.

Sometimes PMC may have faced with claims caused by their defaults. This structure could have solved this problem. Because the consultants' agreements determined the expiry date of the services as one month after taking-over and three months after the airport's opening respectively, there should have been an organization

which handled the outstanding claims and the claims filed after the end of consultants' services. In some situations, claim management needed integration among several work packages. However, there are two possible disadvantages of the proposed arrangement. It may consume additional costs to hire more staff and train them to be claim engineers. However, this cost seems to be small compared with the cost of claims that AOT could save. The other possible disadvantage is that establishing a claim management team may have caused a negative perspective from the public.

Table 8-3 Advantages and Disadvantages of the Proposed AOT Organization Structure

Advantage	Disadvantage
1. Higher Claim Management Efficiency	1. Higher Cost
2. No Consultants' Conflict of Interest Problem	2. Public Negative Perception
3. Consistency among Packages	
4. Coordination among Divisions	
5. Expertise of Staff	
6. Handling Claims Occurring after Consultants' End of Services	
7. Integrated Claim Management	

b. Construction Management System

Construction record keeping process should have been improved in order to support the proposed claim management system. All claim data should have been recorded timely and completely in order to become inputs of the proposed system.

c. Contract Management System

In this project, the contract management system was ready for implementation of the proposed claim management system. However, contract provisions and all relevant regulations should have been deliberately reviewed and complied. When contractors breached any contract provision, the claim engineer should notify the contractor about the reservation of the right to claim according to the procedure specified in the contract.

d. Information System

The framework of the claim management information system applied in this project is shown in Figure 8-5.

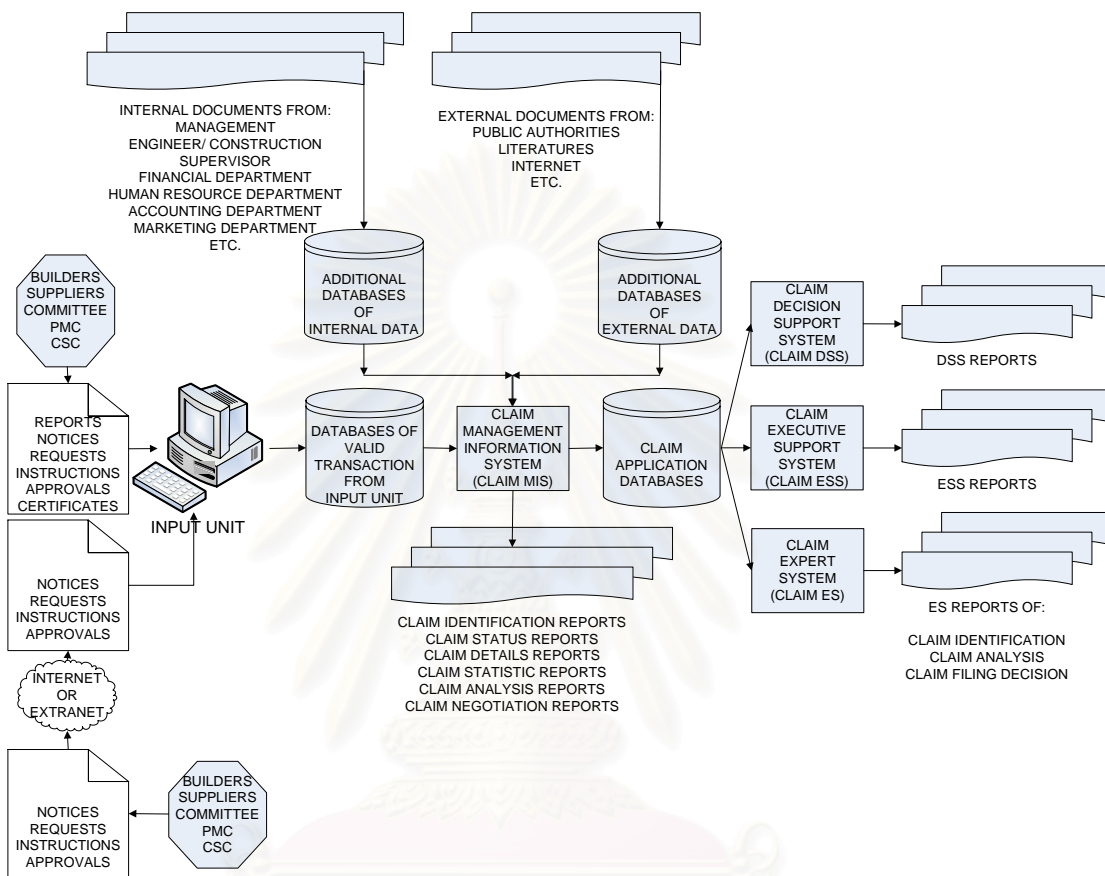


Figure 8-5 Framework of Proposed Claim Management Information System for AOT

Implementation of an information system used for claim management purpose would have required only a small budget because the network infrastructures in the organization were quite ready. However, a database management system would be required to manipulate a large number of claim data effectively.

e. Document Control System

The Document Control System should have been improved so that the required documents could be found quickly and easily. All submitted and received documents should have been coded and recorded in a database. When the claim manager wants

to find a document, he could search for it by its key information such as keywords in topic, date, sender, receiver, status, etc.

f. Dispute Resolution System

The interview results showed that the dispute resolution system in the existing project was quite good. There were qualified legal in-house staff members who were responsible for preparation of the arbitration process. In critical cases, legal support from the other public authorities such as Office of the Attorney General in Thailand could have been requested. However, an international law consultant should have been employed to give advice to AOT for settling disputes in the international arbitration court.

5. Revision of regulations and contract provisions

There was no regulation that opposed the implementation of the proposed system in the project. However, for construction of Phase 2 of the airport, some points of the contract should have been reviewed and revised. Firstly, the Engineering Procurement and Construction (EPC) or turnkey contract should have been studied to determine whether it would have been better for the project than traditional design-bid-build contract. Secondly, some contract provisions such as the service periods of consultants and price adjustment due to price escalation should have been reviewed and revised.

Another task that could have facilitated the proposed claim management system would have been to prepare standard forms to be used for claim purposes. They are the Claim Identification Form and Notice of Claim Notification Form. The first form would have been submitted by any staff who recognized the claim to the claim management team member responsible for the work of notifying the occurrence of claims. The Notice of Claim Notification Form would have been used to notify the contractor that the employer wanted to reserve the right to claim against him.

6. Tuning parties' attitudes and ethics.

One of the biggest factors that would have hindered the implementation of the proposed claim management system in the Suvarnabhumi Airport Project was the public's negative perception. This may have been caused by the fact that some Thai people do not understand the advantages of having claim management in a project. Before implementation of the system, AOT should have had the public understand the

concept of claim management as well as advantages that the project would receive from the claim management system.

7. Others

There are two topics that should have been addressed in preparing to implement the proposed claim management system, budget and staff. The number of engineering staff in the project was quite limited. However, the number of staff required for the proposed system would be little, so AOT could have recruited and trained the new staff to be members of a claim management team.

As to budgeting, the cost of implementation the proposed system would be minor comparing to the benefits of the system. Major costs of this implementation would be the salary of the claim management team members and implementation of the database management system in the existing network. A rough estimate of the necessary cost can be shown as follows.

a. Salary: 15 personnel x 127 Months* x 40,000 Baht/ man-month	=	76,200,000	Baht
b. Training Cost: 20 hr. x 2,000 Baht/ hr. =		40,000	Baht
c. Database Management System =		<u>500,000</u>	Baht
Total Cost =		<u>76,740,000</u>	Baht

* from February 1996, the month that the New Bangkok International Airport Company Limited (NBIA) was founded until September 2006, the planned airport's opening date (AOT, 2006a)

Note that some costs were not included in the above estimation such as consultants' fees, advertisement costs, office stationary costs, and costs of improving some existing systems which in-house AOT staff could have performed.

Compared with the benefits that would have been acquired, the approximate value of claims for variation orders filed by the contractors against AOT assessed at the beginning of the year 2006 (where the construction process was not complete) was more than seven billion baht. If the percentage of budgets saved by improving claim management by the 5% estimated by one interviewee is used, the approximate budget that AOT could have saved from variation claims is higher than 350 million baht. This

estimate does not include the other types of claims as well as loss of revenues of AOT for delayed opening of the airport. The above rough calculation addresses the distinctive difference between costs and benefits gained, supporting the benefit of the proposed claim management system.

8.4.2 Expected Advantages of the System

Besides the budget saved discussed above and advantages of the new organization structure shown in Table 8-3, the implementation of the proposed claim management system would have given various additional advantages. Almost all problems of the claim management system collected in the interviewed and discussed in the previous topic could have been eliminated. The majority of them (i.e., problems concerning organization structure, laws and regulations, project resources, general claim management procedures, claim notification, claim documentation, and claim preparation) could have been solved if AOT had followed the guidelines for preparation of the implementation.

As to the remaining problems, there would have been the systematic claim identification approach if the proposed system was implemented. Inadequate evidence problems and mistakes in evidence problems would have been solved because preparation of such evidence would have been closely monitored by the claim management team staff.

There may have been some other advantages which cannot be quantified such as better project management, higher efficiency of the other systems in the project, and better organization images to foreign contractors and the public, providing that the claim management concept would be more accepted in Thai construction industry.

8.5 Summary

In this chapter, the feasibility study of implementation of the proposed claim management system in the real-world construction project was performed. For this purpose, the Suvarnabhumi Airport construction project was selected because of its internationality, large scale, and application of the *Conditions of Contract for*

Constructions (First Edition). In this research, five key staff members from the Airports of Thailand Public Company Limited (AOT), two from Project Management Consultant (PMC) staff, and one from Construction Supervision Consultant (CSC) companies were interviewed. In addition, some analysis, such as of organization structure, information system, costs and benefits of implementation, and availability of claim data, were also performed.

The informants provided various problems and suggestions concerning the existing claim management in the Suvarnabhumi Airport construction project, which were placed into several groups: (1) organization structure, (2) laws and regulations, (3) resources, (4) claim management procedures.

It was shown that, the proposed claim management system could have been implemented in the Suvarnabhumi Airport construction project if some tasks had been performed.

1. The Contractor's Cost of Capital needed to be acquired by asking for it from the contractor in pre-qualification or tendering process or by pre-determining it in the contract in order to ensure that all claim data would be available.

2. The document control system needed to be improved to ensure that all important events occurring in project would be reported.

3. Claim management and details of the proposed claim management system were the topics about which the staff members as well as CSC's staff needed to be educated before implementing of the proposed system while project staff members should also have been trained how to effectively perform documentation work.

4. Project organization of AOT needed to be rearranged, as shown in Figure 8-4 to facilitate the claim management procedure.

5. Construction record keeping process needed to be improved in order to support the proposed claim management system. All claim data should be recorded timely and completely in order to be the inputs of the proposed system.

7. The claim management information system, as shown in Figure 8-5, needed to be applied in the project. Implementation of the proposed information system would require only a small budget because the network infrastructures in the organization were

quite ready. However, a database management system was required to manipulate a large number of claim data effectively.

8. The Engineering Procurement and Construction (EPC) contract or the turnkey contract should have been studied to determine whether it was better for the project than the traditional design-bid-build contract while some contract provisions such as the service period of consultants and price adjustment due to price escalation should have been reviewed and revised.

9. Forms of Claim Identification and Notice of Claim Notification should have been prepared. The first form would be submitted by any staff who recognizes a claim to the claim management team member who responsible for the work of notifying the occurrence of a claim in the work. The Notice of Claim Notification Form would be used to notify the contractor that the employer wanted to reserve the right to claim against him.

10. Attitudes to claims needed to be tuned.

11. Claim management staff needed to be recruited.

As to the benefits of implementation of the proposed system, there were several benefits, both monetary and non-monetary, that the AOT would have received from implementation of the system. The cost of implementing the proposed system would be very small in comparison to the benefits of the system such as the costs saved from contractors' claims and losses of revenue due to project delay. In addition, almost all problems of the claim management system collected from interviews could have been eliminated by the system implementation. Besides, there may have been some other advantages which cannot be quantified such as better project management, higher efficiency of other systems in the project, and better organization images to the foreign contractors and the public, providing that the claim management concept would be more accepted in Thai construction industry.

In conclusion, the proposed claim management system is feasibly implemented in the real-world construction project.

CHAPTER IX

SUMMARY, CONCLUSION AND RECOMMENDATION

9.1 Summary and Conclusion

In this research, the results can be grouped into fifteen topics. These topics and their relationships are shown in Figure 9-1. The numbers shown in the square brackets ([]) indicate the respective numbers of research results discussed in this chapter.

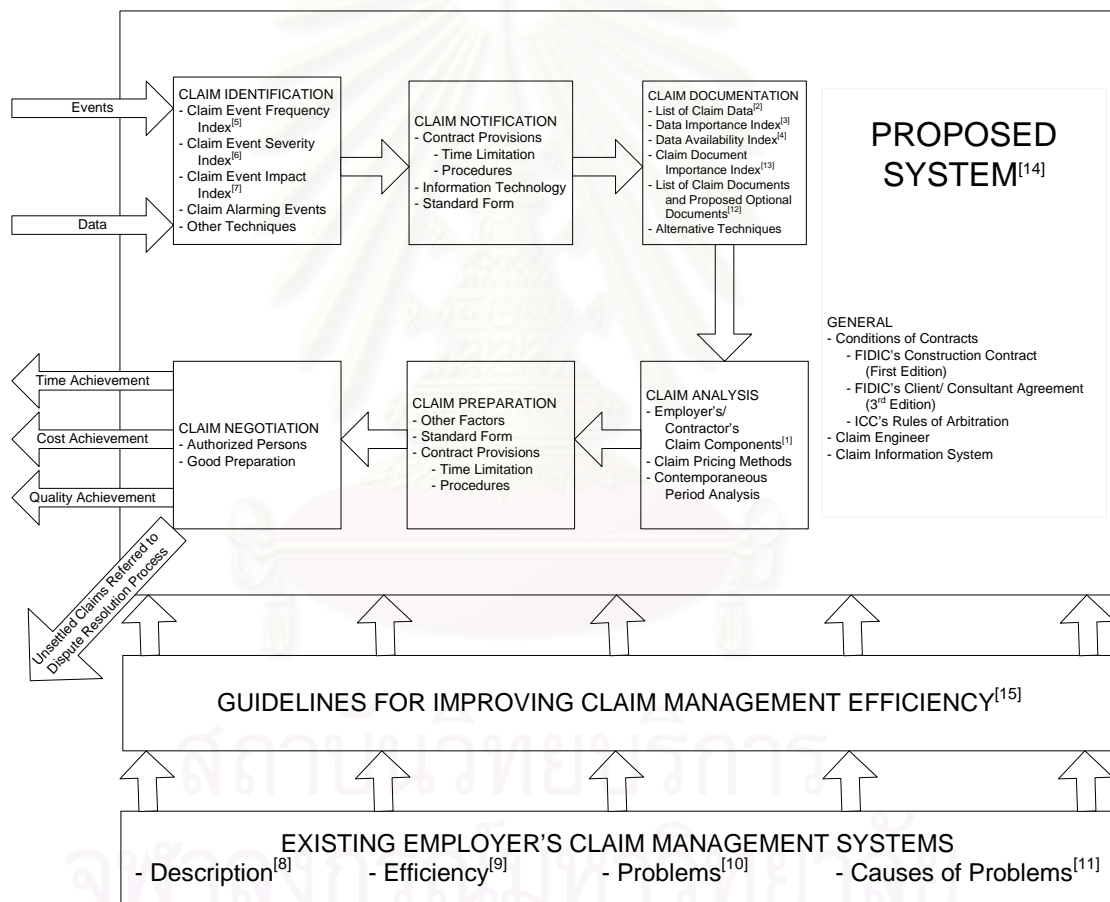


Figure 9-1 Summary of Research Results

The proposed claim management system [14] consists of six sub-processes: claim identification, claim notification, claim documentation, claim analysis, claim preparation, and claim negotiation. The Claim Event Frequency Index [5], Claim Event

Severity Index [6], and Claim Event Impact Index [7] can help identify occurrences of claims. A list of 105 pieces of claim data [2] as well as their Claim Data Importance Indices [3] and Claim Data Availability Indices [4] show what data need to be collected while the list of claim documents [12] and their Document Importance Indices [13] show how important the documents are for claim management purposes. In pricing claims, the employer's claim cost components [1] are very important.

The efficiency of the proposed claim management system [14] is supported by the Guidelines to Improve Claim Management Efficiency [15]. Such guidelines were derived by performing studies of the existing employer's claim management system in several aspects such as its details [8], efficiency [9], problems [10], and causes of the problems [11].

1. Employer's Claim Cost Components

In performing claim analysis and pricing, the employer's claim should be analyzed by dividing it into several components, similar to the contractor's claim. Former research works proposed the classification method for dividing the contractor's monetary claim into various cost components while no work clearly mentioned the employer's claims. There were 22 employer's claim cost components proposed in this research. The list of them can be found in Table 3-4.

2. List of Claim Data

Claim data are the data necessary in the claim management process, especially in the claim analysis phase. There were 105 pieces of claim data, which can be divided into four groups: (1) High Importance - High Availability Data, (2) High Importance - Low Availability Data, (3) Low Importance - High Availability Data, and (4) Low Importance - Low Availability Data, by using the "Claim Data Importance Index" and "Claim Data Availability Index" briefly mentioned in following items (3) and (4). Table 4-2 showed the list and groups of the data, as well as their indices. The data with high importance but low availability should be given special attention by the employers. The understanding acquired from these indices can educate the employers about the importance and availability of claim data and can enhance effective claim management processes.

3. Claim Data Importance Index

Identification of the important data in the claim management process and the level of importance for each piece of claim data were identified in the “Claim Data Importance Index”. The higher index shows the higher importance of the data to the claim management process. The Claim Data Importance Index of each piece of claim data was shown in Table 4-2. Considering Claim Data Importance Indices, some recommendations were drawn.

4. Claim Data Availability Index

The Claim Data Availability Index, which shows how easily claim data can be collected from existing claim management systems, were shown in Table 4-2. The higher Claim Data Availability Index, the easier such data can be obtained.

5. Claim Event Frequency Index

A Claim Event was defined as an event in which the parties can refer to in proving claim liability. In this research the frequency of occurrence of each claim event in construction projects, both of the employer and the contractor, were identified in the form of the “Claim Event Frequency Index”. Details of how to calculate Claim Event Frequency Index can be found in Section 3.2 [Questionnaire Survey] while the list of the claim events, as well as their frequency, and their severity (mentioned in item (6)) can be found in Tables 3-8 and 3-9.

6. Claim Event Severity Index

Similar to the Claim Event Frequency Index, the “Claim Event Severity Index” shows the effect per occurrence of the concerned claim event. The higher the Claim Event Severity Index, the more such claim event will effect on the project. Section 3.2 [Questionnaire Survey] shows how to find the indices. In addition, a list of Claim Event Severity Indices of both employer's and contractor's claim events were in Table 3-8 and Table 3-9.

7. Claim Event Impact Index

Because both frequency and severity have significant effect on construction projects, they should be considered in finding the impacts of a specific type of claim event in construction projects. This can be done by finding the “Claim Event Impact Index” of claim events. The higher the index, the higher level of effects the event has on the project. Details of the claim event's impact and the calculation method were in

Section 3.2 [Questionnaire Survey] while the list of Claim Event Impact Indices of both employer's and contractor's claim events were in Tables 3-8 and 3-9.

Contractors in construction projects have to cope with the events entitling them to claim more often and with higher average severity than the employers. For this reason, the Claim Event Impact Indices of the contractors is much higher than those of the private and public employers. The highest frequency and impact of the events justifying the rights to claim on contractual claims emphasizes the importance of good preparation of the construction contract at the beginning of the project. A well-prepared construction contract can help both the project employers and the contractors settle the changes that occur before they become claims or disputes, which consume much more time and costs from both parties to solve.

On the other hand, ex-contractual claims also have a high level of effect on projects, which can be seen from their frequency and impact. This implies that both parties need to not only deliberately scrutinize contract documents, but also to familiarize themselves with the laws, regulations, and other standards of work related to the project. This would help them avoid or more efficiently settle the changes that occur. Finally, ex-gratia claims are the least frequent claims occurring for all three groups. They seem to have a low impact on the employers, but they play an important role for the contractors. The highest severity ranked by the respondents from the contractors' organizations implied that even though ex-gratia claims do not occur very often in the projects, the contractors felt that they have a high level of impact on their performance.

8. Details of the Existing Claim Management System

The details of the present claim management system of construction project employers, in both private and public sectors, were surveyed, analyzed and presented. Such details consisted of the staff members who are responsible for claim management, the relevant regulations and contract provisions, and the distinctive features of Thai construction claim management. The results showed that claims are generally handled by project directors or project managers in private construction projects while employment supervisory committees will handle these responsibilities in public projects. The Thai-styled employer's claim management system differs from international ones in

several respects: the employers' attitudes towards claims, the employers' prevailing power over their contractors, types of claims generally filed in projects, and the methods of recovering damages.

9. Efficiency of the Existing Claim Management Systems

How well an employer performs each claim management sub-process (e.g., claim identification, claim notification, claim documentation, claim analysis and pricing, and claim negotiation) or overall claim management process was measured by finding the corresponding "Claim Management Efficiency Index". The higher the index, the better the employer is able to perform the claim management task. Details of how to find the process or sub-process "Claim Management Efficiency Index" and the list of the indices can be found in Section 3.2 [Questionnaire Survey] and in Table 3-10, respectively.

Public employers seem to have higher active claim management efficiency than private employers while the private employers are better at managing defensive claims. The public employers and the contractors seem to play active claim management roles, as seen from the higher overall active claim management indices.

The activity that the private employers, on average, can perform well is keeping documents for substantiation of claims against them while they should improve their identification and negotiation abilities. The public employers are also good at keeping documents for substantiation of the contractors' claims but they are not good at negotiation of such claims. On the other hand, the contractors are good at documentation of their claims against the employers while they are poor at identifying of the employers' claims against them.

10. Problems of the Existing Claim Management Systems

There were several problems found in the existing Thai employer's claim management systems, in both private and public sectors. These problems can be placed into seven groups: (1) failures to claim, (2) difficulties in claim settlement, (3) unfairness, (4) delayed processes, (5) large amount of claims/ disputes, (6) non-value-added works, and (7) not being international. Further details of the problems of the existing claim management system can be found in Section 6.2 [Problems of the Existing Claim Management Systems and Their Causes].

11. Causes of the Problems of Existing Claim Management System

The problems of the existing Thai employer's claim management were caused by various factors: (1) parties' deficiencies, (2) defaults, (3) law and contract provision inadequacies, and (4) natures of construction claims.

There are some problems caused by the incapacity of the parties: employer, contractor, engineer, and law department staff. For the employers, some lack contract management skills, construction process understanding, supervisory staff, correct attitudes, and good ethics. On the other hand, some contractors lack construction management, claim management proficiency, staff, and realization of the importance of claim management, contract reviewing, and record keeping. A number of contractors have attitudes that endorse corruption or bid-collusion. As to the engineers, they also have a limited knowledge of construction law, regulations, contract management, and claim management. In addition, some of them lack staff, sufficient authority to perform their obligations, positive attitudes, and realization of the importance of contract management, claim management, and strict implementation of regulations. Finally, some law department officers do not have adequate understanding of construction methods and practices.

There are a number of problems caused by the parties' defaults in performing their obligations. The employers can cause problems if they give oral or unclear instructions to contractors, weak implementation of regulation monitoring, make late decisions, issue unfair instructions or judgments, and try to take advantage of their contractors. Similarly, Thai contractors also have defaults. Some contractors have insufficient contract management skills and poor performance. As to claim management, the contractors usually fail to comply with the notice requirement provision and some perform bid collusion. Engineers can cause problems by omission, weak performance of their duties, or being partial to their employers. Poor communication is also a source of problems caused by engineers.

Inadequate contract documents and regulations are significant sources of problems. Some contract documents are incomplete and several deficiencies in contract provisions cause problems for claim management process. In Thai public standard construction contract, the inadequate provisions consist of claim-related

provisions, and unclear & tenuous employer's and engineer's rights. On the other hand, the contracts used in private projects are normally acquired by two sources: modified international standard contract and custom-made construction contracts. Immense employer's and engineer's rights and silence of contractor's rights are also found in private contracts. As to the procurement processes of the public authorities, the "Prime Minister's Office Regulations Governing Procurement 1992" was sometimes seen as unclear and bureaucratic. Almost all organizations have standard forms used in collecting data and communication of necessary information. However, only a few organizations have standard forms used for claim management purposes and the standard forms used in some organizations are incomplete.

The last group of causes of claims is the natures of construction claims. Because of these factors, claim management problems tend to occur, even though all parties try their best to protect themselves from problems. Firstly, claims occur among the different parties in a construction project who have differences in expertise, roles, responsibilities, backgrounds, and available information. Secondly, claims always tend to cause inconvenience, impact on relationships, and sometimes unfavorable outcomes. Thus, some parties are reluctant to file a claim against the other.

Further details of the causes of claims in the existing Thai employer's claim management system are in Chapter 6 [Problem-Cause-Solution Analysis].

12. List of Claim Documents

Analysis resulted in 352 documents specified by the FIDIC's agreements/ ICC's rules of arbitration, which can be placed into 181 groups of documents. Most of them are related to the employer or the engineer except six groups of documents (eight total documents). In these groups of documents, 143 groups (264 documents) contain necessary claim data. A list of all documents is in Appendix B.

13. Claim Document Importance Index

In order to indicate the documents that the employer and the engineer should give a high level of attention to, the Claim Document Importance Index was defined. The Document Importance Index indicates how important a document is in managing claims. It can be calculated by summing all of the Data Importance Indices of the claim data contained in the document.

From ranking all documents in the representative project by their Claim Document Importance Indices, there are 83 groups (164 documents) with high importance, 60 groups (100 documents) with medium importance, and 83 groups (121 documents) with low importance, respectively. Table 5-4 shows the top ten documents with the highest Claim Document Importance Index. It also reveals the importance of the reports prepared by the consultants, minutes of meetings, statements, site diaries, and certificates. The documents acquired from external sources such as notices of expert's opinion, publications, cost indices, as well as exchange rates also have significant roles in substantiation of claims. The documents flowing in claim process and dispute resolution process tend to contain the information necessary for proving one's rights and responsibilities, which is in accordance with their high indices.

14) Proposed Claim Management System

An effective model of the employer's claim management system was designed by considering the overall system and the separate claim management sub-processes: claim identification, claim notification, claim documentation, claim analysis, claim preparation, and claim negotiation.

To have claims managed timely and continuously, there should be a person who is directly responsible for handling claim functions, well-prepared standard provisions of some standard forms of contracts, and an effective information system. Claims can be well identified by paying a high level of attention to the events that have high levels level of impact and severity on the project and those recommended in the previous research as events that alarm the parties to a claim occurrences (Adrian, 1988). In addition, some techniques can also be used to identify the claims.

Notification of claim to the other party is an important obligation in the construction contract. This process can be facilitated by deliberately scrutiny of the contract provisions related to the notice requirement, application of information technology, and preparation of standard forms used for claim notification purposes. In addition, records are necessary in claim management. All 105 pieces of claim data, contained in the 143 groups of claim-related documents (264 documents) are necessary for analyzing, preparing, substantiating and settling claims. The claim manager should pay a high level of attention to them, especially those with a high level of Claim Data

Importance Index or Claim Document Importance Index for the claim data and claim documents, respectively.

In the analysis process, the claim manager has to find the claim liability and claim quantum, which can be further divided into time quantum and cost quantum. International approaches to substantiate or calculate these items shall be adopted. Some items have more than one method of calculation, but the analyst has to deliberately select the appropriate approach by taking account of its advantages, disadvantages, the purposes of use, and constraints (if any). Claim preparation should be supported by deliberately scrutiny of the contract provisions related to the claim procedure and required documents and pre-setting format of the claim report. Finally, in order to succeed in negotiation about claims, good preparation is very important. Some techniques suggested by previous research can help the claim manager in this situation.

Details of the proposed employer's claim management system are described in Chapter 7.

15. Guidelines for Improving Claim Management Efficiency.

In order to increase claim management efficiency, employers should follow the suggested guidelines: (1) educating and providing consulting services, (2) implementation of systems, (3) revision of regulations and contract provisions, and (4) tuning parties' attitudes and ethics.

Project staff members should be educated, in at least the necessary knowledge they need in order to perform their responsibilities well. Employers should know about construction process, and some of their contractual rights such as "defects liability" and "rights to vary" while engineers should know about related laws and regulations, contract and claim management process, and the importance of the contract review process. Concerning the claim management process, the knowledge that the engineer should know is comprised of his rights to claim, the necessary documents, and claim analysis methods. In case the education approach seems to be inappropriate or impractical, some knowledge mentioned above can be obtained by providing consulting services.

Employers should pay attention to claim management systems in both general and all phases. In order to enhance the efficiency of the claim management process, additional systems shall be concurrently implemented: procurement, contract management, dispute resolution, project management, and construction management systems.

It is necessary to revise contract provisions, regulations, organization policies, consultant agreement provisions, and standard forms used in a construction project. There are several claim-related provisions that need to be inserted or revised. In addition, there are several inadequacies found in Thailand's public construction employer - engineer agreement and government regulations related to construction project procurement. Besides the contract provisions and the regulations, the organization policies and the standard forms used also need to be revised.

The final topic is dedicated to enhancing good attitudes and ethics. Claims should be looked as a tool of fairness which can occur in every project. The importance of effective claim management as well as contract management should be realized. Corruption is dangerous to the industry and should be avoided. The contract should be fair to all relevant parties and the contractor should bear suitable degree of risks and responsibilities. Finally, the engineer should be looked as an independent professional party, not the full-time employee of the employer. As to ethics, every party concerned in a construction project should have high ethical standards. Engineers should avoid corruption and partiality while employers should not take advantage of his contractor, and contractors should not commit corruption and overestimate their claims.

Further details of the Guidelines for Improving Claim Management Efficiency were discussed in Chapter 6 [Problem-Cause-Solution Analysis].

In conclusion, this research demonstrates that employers have effective tools for managing construction claims occurring in their projects, which can lead to successful projects as stated in the objective of this research.

9.2 Recommendations for Further Research

Since this research focused on finding a required system for managing employer's construction claims in all types of projects for all employers, the claim management system suggested was paper-based. However, the framework of the computer-based claim management information system implementation was presented in Chapter 7. For this reason, further study should be focused on implementation of the computer-based claim management system in organizations. The data and documents necessary to manage construction claims, and the framework of the claim information systems acquired in this research should be used in designing the system.

From research, it was found that claim documentation is a key to successful claim management. Claim managers need document control systems that can help them store, search, and find required documents timely, securely, and efficiently. The claim-management-oriented document code system will be very useful for developing the document control system. However, the research of this field is still lacking.

Finally, Thai construction industry needs more research to improve employers' and contractors' knowledge and attitudes towards claims and claim management process. Claims are useful tools that enhance fairness and effective control of the parties' obligations while claim management leads the project parties to fair and successful projects.

REFERENCES

- Abdul-Malak, M. Asem U., El-Saadi, Mustafa M. H. and Abou-Zeid, Marwan G.. Process Model for Administrating Construction Claims. Journal of Management in Engineering 18, 2 (April 2002) : 84-94.
- Adrian, James J.. Construction Claims : A Quantitative Approach. New Jersey : Prentice-Hall, 1988.
- Airports of Thailand Public Limited.[AOT]. Suvarnabhumi Airport: Home [Online].
Suvarnabhumi Airport Website:
<http://www.suvarnabhumiairport.com/th/index.htm> [19 Mar 2006a].
- Airports of Thailand Public Limited.[AOT]. Annual Report 2005 [CD-ROM]. Bangkok: AOT, 2006b.
- Alkass, Sabah and Harris, Frank. Expert Systems : Construction Contractor's Claims Analysis : An Integrated System Approach. Building Research and Information 19, 1 (1991) : 56-64.
- Al-Saggaf, Hamed. The Five Commandments of Construction Project Delay Analysis. Cost Engineering 40, 4 (April 1998) : 37-41.
- Arditi, David and Patel, Bhupendra K.. Expert System for Claim Management in Construction Project. Project Management 7, 3 (August 1989) : 141-146.
- Baram, George E.. Integrity and Credibility in Construction Dispute Resolution- Documenting and Presenting the Facts. Cost Engineering 36, 4 (April 1994) : 27-33.

Booen, Peter L.. FIDIC's Conditions of Contract for the Next Century: 1998 Test Editions, International Construction Law Review 1999: 5-26.

Bu-Bshait, Khaled and Manzanera, Ignacio. Claim Management. Project Management 8, 4 (November 1990) : 222-228.

Bubbers, Geoffrey and Christian, John. Hypertext and Claim Analysis. ASCE Journal of Construction Engineering and Management 118, 4 (December 1992) : 716-730.

Bunsrangserm, Nujjaree. A Study of the Deficiencies in the Contractual Conditions of the Government Construction Contract. Master Thesis, Department of Civil Engineering, Chulalongkorn University, 2000.

Callahan, Joel T. Managing Transit Construction Contract Claims. Synthesis of Transit Practice 28. Washington : National Academic Press, 1998.

Chappell, David. Contractor's Claim : An Architect's Guide. London : The Architectural Press, 1984.

Chappell, David, Powell-Smith, Vincent and Sims, John. Building Contract Claims. Oxford: Blackwell Publishing, 2005.

Chovichien, Visuth and Tochaiwat, Kongkoon. Guidelines for Improvement of Dispute Resolution Process in Thai Public Construction Contracts, Engineering Technology Conference and Exhibition 2002, 31-38. Bangkok : The Engineering Institute of Thailand under H.M. the King's Patronage[E.I.T.], 2002a.

Chovichien, Visuth and Tochaiwat, Kongkoon. A Study of the Quality Aspect of FIDIC Contract Application in Thai Construction Industry, Proceedings of The Eight National Convention on Civil Engineering, Khon Kaen, 23-25 October 2002b.

- Chovichien, Visuth and Tochaiwat, Kongkoon. A Study of Cost and Payment Aspects of FIDIC Contract Application in Construction Contracts of Development Projects, Proceedings of The Prince of Songkla University Conference, Songkla, 21-22 August 2003a.
- Chovichien, Visuth and Tochaiwat, Kongkoon. Employer's Rights and Responsibilities Affecting Quality of Works in Thai Public Infrastructure Construction Contracts, Proceedings of The First National Transport Conference, Bangkok, 17 October 2003b.
- Chovichien, Visuth and Tochaiwat, Kongkoon. Innovation in FIDIC Standard Contract and Improvement of Thai Public Construction Contract, Proceedings of The Conference of 40th Year Anniversary of Faculty of Engineering at Khon Kaen University, Khon Kaen, 23 – 25 January 2004a.
- Chovichien, Visuth and Tochaiwat, Kongkoon. The Implication of Termination Clauses in Thai Public Construction Contracts, Proceedings of The Ninth National Convention on Civil Engineering, Prachuabkirikhan, 19–21 November 2004b.
- Cox, Robert K.. Managing Change Orders and Claims. Journal of Management in Engineering January/ February 1997 : 24-29.
- Crowther, Jonathan. Oxford Advanced Learner's Dictionary of Current English. Fifth Edition. New York : Oxford University Press, 1995.
- Craig, W. Laurence and Park, William W., and Paulson, Jan. International Chamber of Commerce Arbitration. Second Edition. Paris : ICC Publishing S.A., 1990.
- Dennis, Alan and Wixom, Barbara Haley. Systems Analysis and Design. New York : John Wiley & Sons, 2000.

- Diekmann, James E. and Kruppenbacher, Timonhy A.. Claim Analysis and Computer Reasoning. ASCE Journal of Construction Engineering and Management 110, 4 (Dec 1984) : 391-408.
- Diekmann, James E. and Kim, Moonja P.. SuperChange : Expert System for Analysis of Changes Claims. ASCE Journal of Construction Engineering and Management 118, 2 (June 1992a) : 399-411.
- Diekmann, James E. and Gjertsen, Knut. Site Event Advisor :Expert System for Contract Claims. ASCE Journal of Computing in Civil Engineering 6, 4 (October 1992b) : 472-479.
- Elnagar, Hala and Yates, Janet K.. Construction Documentation Used as Indicators of Delays. Cost Engineering 39, 8 (August 1997) : 31-37.
- Fédération Internationale des Ingénieurs-Conseils. Client / Consultant Model Services Agreement. Third Edition. Lausanne: FIDIC, 1998.
- Fédération Internationale des Ingénieurs-Conseils. Conditions of Contract for Construction. First Edition. Lausanne: FIDIC, 1999.
- Guo,Sy-Jye. Identification and Resolution of Work Space Conflicts in Building Construction. ASCE Journal of Construction Engineering and Management 128, 4 (July/ August 2002) : 287-295.
- Hughes, G. A. and Barber, J. N.. Building and Civil Engineering Claims in Perspective. London : Longman Scientific & Technical, 1992.
- Jergeas, George F. and Hartman, Francis T.. Contractor's Construction-Claims Avoidance. ASCE Journal of Construction Engineering and Management 120, 3 (September 1994) : 553-560.

- Jervis, Bruce M. and Levin, Paul. Construction Law: Principle and Practice. New York : McGraw-Hill, 1988.
- Khanchitvorakul, Sirithorn. Development of Construction Claim Supporting System. Master Thesis, Department of Civil Engineering, King Mongkut University of Technology Thonburi, 2000.
- Kartam, Saied. Generic Methodology for Analyzing Delay Claims. ASCE Journal of Construction Engineering and Management 125, 6 (November/December 1999) : 409-419.
- Kraiem, Zaki M. and Diekmann, James E.. Representing Construction Contract Legal Knowledge. ASCE Journal of Computing in Civil Engineering 2, 2 (April 1988) : 202-211.
- Kululanga, G. K. et. al.. Construction Contractors' Claim Process Framework. ASCE Journal of Construction Engineering and Management 127, 4 (July/August 2001) : 309-314.
- Kumaraswamy, Mohan M.. Conflicts, Claims and Disputes in Construction. Engineering, Construction and Architectural Management 4, 2 (1997) : 95-111.
- Laudon, Kenneth C. and Laudon, Jane P.. Management Information Systems: Managing the Digital Firm. Seventh Edition. New Jersey : Prentice-Hall, 2002.
- Levin, Paul. Construction Contract Claims, Changes & Dispute Resolution. Second Edition. Boston : ASCE Press, 1998.
- McDonald, Phillip R.. Construction Claims Costing for Owners and Contractors. Construction Management and Economics 2 (1984) : 1-12.

Moselhi, Osama and El-Rayes, Khaled. Analyzing Weather-Related Construction Claims. Cost Engineering 44, 8 (August 2002) : 12-19.

Murdoch, John and Hughes, Will. Construction Contract : Law and management. Second Edition. London : E & FN SPON, 1996.

National Economic and Social Development Board [NESDB]. Gross Domestic Product Originating from Construction [Online]. NESDB Website: <http://www.nesdb.go.th/econSocial/macro/NAD.htm#ni> [21 July 2004].

New Bangkok International Airport Company Limited [NBIA]. Contract for The Construction of Passenger Terminal Complex for The Second Bangkok International Airport. Bangkok : NBIA, 2001.

Office of the Council of State. Prime Minister Office's Regulations Governing Procurement [Online]. The Council of State Website: <http://www.krisdika.go.th/home.jsp> [26 July 2005].

Pogorilich, David A.. The Daily Report as a Job Management Tool. Cost Engineering 34, 2 (January 1992) : 23-25.

Riad, Nagui I., Arditi, David and Mohammadi, Jamshid. Integrated System for Managing Owner-Directed Project Acceleration. ASCE Journal of Construction Engineering and Management 120, 1 (March 1994) : 77-95.

Scott, Steve and Assadi, Sami. A survey of the site records kept by construction supervisors. Construction Management and Economics 17 (1999) : 375-382.

Semple, Cheryl, Hartman, Francis T., and Jergeas, George. Construction Claims and Disputes : Clauses and Cost/ Time Overruns. ASCE Journal of Construction Engineering and Management 120, 4 (December 1994) : 785-795.

Seppala, Christopher R.. Claims, Resolution of Disputes and the DAB [Online].
Fédération Internationale des Ingénieurs-Conseils :
www.fidic.org/resources/contr.../seppala_haque99_claims.htm [1999].

Stair, Ralph M. and Reynolds, George W.. Principles of Information Systems: A Managerial Approach. Sixth Edition. Canada : Thomson Learning, 2003.

Surawongsin, Panya. The Implementation of Construction Claims Management in the Thai Construction Industry. Master Thesis, School of Civil Engineering, Asian Institute of Technology [AIT], 2002.

Tantavech, Ronnapob. A Prototype Development of a Claim Management System.
Master Thesis, School of Civil Engineering, Asian Institute of Technology [AIT],
2001.

Thai Contractor Association [TCA]. Year 2004: The Beginning of the Golden Age for Construction Industry. Contractors' Times (November - December 2003): 73.

Thomas, H. Randolph and Smith, Gary R.. Resolving Disputes over Contract Notice Requirement. ASCE Journal of Construction Engineering and Management 116, 4 (December 1990) : 738-755.

Thomas, Reg. Construction Contract Claim. Hong Kong : The Macmillan Press, 1993.

Tochaiwat, Kongkoon. A Study of FIDIC Contract Applicability in Thai Construction Industry. Master Thesis, Department of Civil Engineering, Chulalongkorn University, 2001.

- Tochaiwat, Kongkoon and Chovichien, Visuth. Strategic Data for Employers' Construction Claims, Proceedings of CIB W107 symposium on Globalization and Construction – Construction in Developing Economics, Bangkok, 2004a.
- Tochaiwat, Kongkoon and Chovichien, Visuth. Contractors' Construction Claims and Claim Management Process. Research and Development Journal of the Engineering Institute of Thailand 15, 4 (2004b): 66-73.
- Tochaiwat, Kongkoon and Chovichien, Visuth. A Survey of Thai Contractors' Construction Claim Management, Proceedings of The Tenth National Convention on Civil Engineering, Chonburi, 2-4 May 2005a.
- Tochaiwat, Kongkoon and Chovichien, Visuth. Construction Claim Management System for Construction Project Employer Seminar, Bangkok, 7 November 2005b.
- Veenendaal, Jeffrey. Analyzing the Impact of Change Orders on a Schedule. Cost Engineering 40, 9 (September 1998) : 33-39.
- Vidogah, William, and Ndekugri, Issaka. Improving the Management of Claims on Construction Contracts: Consultant's Perspective. Construction Management and Economics 16, 4 (1998a): 363-372.
- Vidogah, William, and Ndekugri, Issaka. A Review of the Role of Information Technology in Construction Claims Management. Computers in Industry 35 (1998b): 77-85.
- Vidogah, William, and Ndekugri, Issaka. Improving Management of Claims: Contractors' Perspective. ASCE Journal of Management in Engineering 13, 5 (September/October 1997): 37-44.

Wonggumchai, Somsak. A Study of Conditions of Construction Contracts in Thailand.

Master Thesis, Department of Civil Engineering, Chulalongkorn University, 1996.

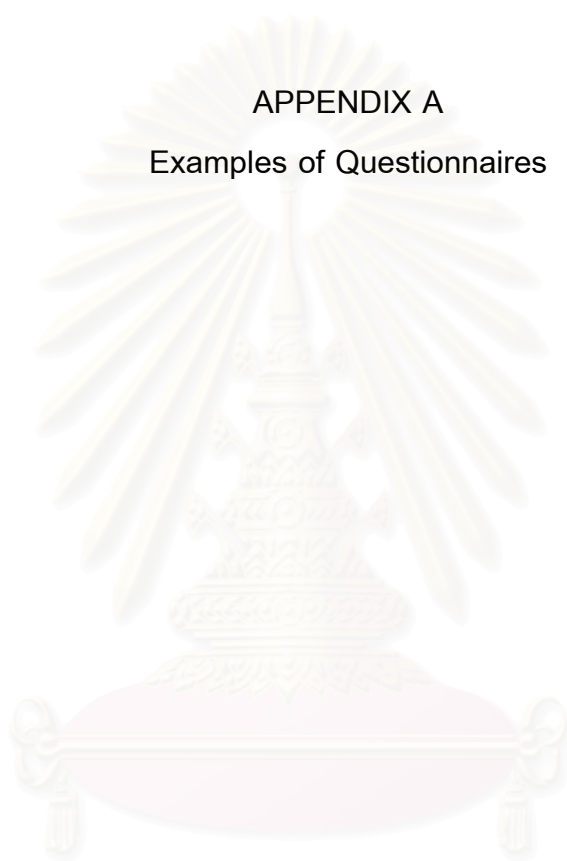


สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

APPENDICES

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

APPENDIX A
Examples of Questionnaires



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

แบบสอบถาม
เรื่อง
การสำรวจการเรียกร้องสิทธิ (Claim)
ของเจ้าของงานก่อสร้าง

รหัสแบบสอบถาม GX-_____

วันที่ส่ง ___/___/_____

ผู้ตอบแบบสอบถาม : บุคคลซึ่งมีประสบการณ์เกี่ยวกับการ Claim ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท เช่น ผู้จัดการโครงการของบริษัทวิศวกรที่ปรึกษาของโครงการ หัวหน้าของส่วนงานซึ่งดูแลเกี่ยวกับการควบคุมการก่อสร้างของหน่วยงาน หรือเจ้าของงานหรือตัวแทนของเจ้าของงานที่ได้รับมอบหมายให้ทำหน้าที่ดังกล่าว

คำชี้แจง :

แบบสอบถามชุดนี้ทำขึ้นโดยมีวัตถุประสงค์เพื่อทำการวิจัยเกี่ยวกับการ Claim และการจัดการการ Claim ของเจ้าของงานก่อสร้างเท่านั้น ข้อมูลที่ได้จากแบบสอบถามนี้ถือเป็นความลับซึ่งใช้เฉพาะในการศึกษานี้เท่านั้น ดังนั้นขอความกรุณาท่าน โปรดตอบตามความเป็นจริง คำตอบของท่านจะเป็นประโยชน์อย่างยิ่งในการพัฒนาการจัดการการ Claim ของเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาให้มีประสิทธิภาพเพิ่มขึ้น มีความสะดวก และรวดเร็วยิ่งขึ้น ซึ่งย่อมส่งผลดีต่อตัวเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาเอง รวมถึงบุคคลผู้ซึ่งเกี่ยวข้องกับการจ้างงานก่อสร้างทุกฝ่ายในที่สุด

หากท่านต้องการข้อมูลเพิ่มเติม สอบถาม หรือ ให้คำแนะนำประการใด ขอความกรุณาติดต่อผู้จัดทำแบบสอบถาม ขอกราบขอบพระคุณในความร่วมมือของท่าน

กองกoon ตรีชัยวัฒน์
นิสิตสาขาบริหารการก่อสร้าง
จุฬาลงกรณ์มหาวิทยาลัย
โทร. XX-XXX-XXXX
อีเมล: kongkoon@hotmail.com

หมายเหตุ :

- ขอความกรุณาท่านช่วยตอบแบบสอบถามชุดนี้และส่งคืนมายังผู้จัดทำแบบสอบถาม **เร็วที่สุดเท่าที่จะเป็นไปได้**
- เมื่อท่านทำแบบสอบถามชุดนี้เสร็จเรียบร้อยแล้ว กรุณาพับแบบสอบถามใส่ลงในซองไปรษณีย์ซึ่งส่งมาพร้อมแบบสอบถามฉบับนี้ และนำไปส่ง ณ ตู้ไปรษณีย์ ที่ใกล้ที่สุด ท่านไม่ต้องเสียค่าใช้จ่ายในการส่งแบบสอบถามนี้คืนผู้จัดทำแบบสอบถามแต่ประการใด

ตอนที่ 1

ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

คำชี้แจง : กรุณากรอกข้อมูลลงในที่ว่างทุกข้อ ข้อมูลของท่านทุกข้อมีความจำเป็นต่อการวิจัยนี้เป็นอย่างมาก

1. ชื่อผู้ตอบแบบสอบถาม _____
2. สถานที่ทำงาน _____ 3. ตำแหน่งปัจจุบัน _____
4. ระยะเวลาในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงาน ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท ประมาณ _____ ปี
5. มูลค่าโครงการสูงสุดที่เคยมีประสบการณ์ในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงานในโครงการก่อสร้าง ประมาณ _____ ล้านบาท

คำจำกัดความ :

1. “การ Claim ของเจ้าของงาน (Employer’s Claim)” หมายถึง การที่เจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย เรียกร้อง เงิน หรือการชดเชยอื่นๆ เช่น การขยายระยะเวลารับประกันความชำรุดบกพร่อง (ในบางสัญญา) การให้ปฏิบัติหรือละเว้นการปฏิบัติ การแก้ไขสัญญา หรือการยกเลิกสัญญา ทั้งที่มีระบุอยู่ในสัญญาและไม่มีระบุอยู่ในสัญญาแต่กฎหมายได้ระบุสิทธิดังกล่าวไว้ จากผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องกับโครงการก่อสร้าง
2. “การจัดการการ Claim ของเจ้าของงาน (Employer’s Claim Management)” หมายถึง กระบวนการซึ่งเจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับการมอบหมายใช้ในการดำเนินการและควบคุมการ Claim ทั้งในการที่เจ้าของงาน Claim ผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้อง และการที่เจ้าของงานตรวจสอบการ Claim ของผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องต่อเจ้าของงาน

ตอนที่ 2

ประสบการณ์เกี่ยวกับสิทธิในการเรียกร้องสิทธิ (Claim) กลุ่มต่างๆ

คำชี้แจง :

- แบบสอบถามตอนนี้อยู่ประกอบด้วยคำถามแบบเติมตัวเลขลงในช่องว่างและคำถามแบบประมาณค่า
- ก. กรุณาเติมตัวเลขลงในช่องว่างที่เว้นไว้ทุกช่อง ให้สอดคล้องกับจำนวนครั้งที่เกิดขึ้นโดยเฉลี่ยต่อ 1 โครงการของเหตุการณ์แต่ละเหตุการณ์ที่ทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา
 - ข. กรุณาทำ “เครื่องหมายกากบาท (X)” ทับหมายเลข (0 ถึง 4) หรือ ตัวอักษร (N) ในแต่ละข้อ ซึ่งตรงกับระดับของผลกระทบต่อเจ้าของงานโดยเฉลี่ยถ้าเกิดขึ้น ของเหตุการณ์ที่ระบุในคำถามแต่ละข้อตามประสบการณ์และความเห็นของท่าน
 - ค. ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ต้องการออกความเห็นเกี่ยวกับคำถามดังกล่าว กรุณาเติมอักษร “ N “ ลงในช่องว่างสำหรับคำถามแบบเติมตัวเลขในช่องว่าง หรือเลือกตัวเลือก “ไม่ออกความเห็น (N)” สำหรับคำถามแบบประเมินค่า ตามแต่กรณี

ตัวอย่าง : จากประสบการณ์ของท่าน โปรดระบุจำนวนครั้งโดยเฉลี่ยซึ่งท่านคาดว่าจะเกิดขึ้นกับผู้ทำประกันชีวิตในการทำประกันชีวิตจำนวน 1 กรมธรรม์ และระดับของผลกระทบต่อนผู้ทำประกันชีวิตโดยเฉลี่ยจากเหตุการณ์ดังกล่าว สำหรับเหตุการณ์ซึ่งทำให้ผู้ทำประกันชีวิตมีสิทธิ Claim บริษัทประกันชีวิตในแต่ละข้อ

เหตุการณ์ซึ่งทำให้ผู้ทำประกันชีวิตมีสิทธิ Claim บริษัทประกันชีวิต	ความถี่ของการเกิดโดยเฉลี่ย	ระดับของผลกระทบต่อนผู้ทำประกันชีวิตโดยเฉลี่ย
1. การที่ผู้ทำประกันชีวิตต้องกลายเป็นคนพิการ	<u>0.05</u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N) X
2. การที่ผู้ทำประกันชีวิตได้รับบาดเจ็บเล็กน้อย	<u>3</u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N) X
3. การที่ผู้ทำประกันชีวิตได้ส่งเบี้ยประกันจนครบตามเงื่อนไขของกรมธรรม์แล้ว และเงื่อนไขของกรมธรรม์ระบุว่าผู้ทำประกันมีสิทธิได้รับเงินคืน	<u>N</u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N) X

1. จากประสบการณ์ของท่าน โปรดระบุจำนวนครั้งโดยเฉลี่ยซึ่งท่านคาดว่าจะเกิดขึ้นในโครงการที่อยู่ในการปฏิบัติหน้าที่ของท่านจำนวน 1 โครงการ และระดับของผลกระทบต่อเจ้าของงานโดยเฉลี่ยจากเหตุการณ์ดังกล่าว สำหรับเหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมาในแต่ละข้อ

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิดโดยเฉลี่ย	ระดับของผลกระทบต่อเจ้าของงานโดยเฉลี่ย
1. การที่ผู้รับเหมาทำผิดเงื่อนไขในสัญญาข้อใดข้อหนึ่ง แต่สัญญาไม่ได้ระบุโดยชัดเจนว่าเจ้าของงานมีสิทธิ Claim ผู้รับเหมาได้	<u> </u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N)
2. การที่เจ้าของงานหรือลูกจ้างได้ดำเนินการใดๆ ที่สัญญาไม่ได้กำหนดให้ต้องทำ แต่ก็ยังเป็นประโยชน์กับผู้รับเหมา	<u> </u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N)
3. การที่ผู้รับเหมากระทำการที่ผิดกฎหมายและทำให้เจ้าของงานเสียหาย	<u> </u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N)
4. การที่เกิดเหตุการณ์ซึ่งทำให้การปฏิบัติตามสัญญาของเจ้าของงานหรือผู้รับเหมาไม่สามารถทำได้หรือไม่เป็นไปตามที่คาดไว้ในขณะที่ทำสัญญา และเหตุการณ์ดังกล่าวไม่สามารถคาดล่วงหน้าได้	<u> </u> ครั้ง	←————→ ไม่ออก ไม่มีผล มีผลอย่างยิ่ง ความเป็น (0) (1) (2) (3) (4) (N)

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อเจ้าของงาน โดยเฉลี่ย
5. การที่ข้อความในสัญญาไม่ตรงกับข้อตกลงระหว่างเจ้าของงานและผู้รับเหมา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
6. การที่เจ้าของงานเข้าใจผิดในเรื่องที่มีผลต่อการตัดสินใจทำสัญญากับผู้รับเหมา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
7. การที่ผู้รับเหมากระทำหรือไม่กระทำให้สิ่งใด ๆ ซึ่งอาจทำให้เจ้าของงานเสียหาย	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
8. การที่พบความคลาดเคลื่อนของข้อมูลที่มีผลต่อการทำงานซึ่งเจ้าของงานได้รับจากผู้รับเหมาก่อนทำสัญญากัน	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
9. การที่เจ้าของงานขอความเห็นใจจากผู้รับเหมา โดย Claim ในสาเหตุซึ่งไม่ได้เป็นความรับผิดชอบของผู้รับเหมา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
10. การที่ผู้รับเหมาใช้สาธารณูปโภคหรือบริการอื่นๆ ของเจ้าของงาน	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
11. การที่ผู้ควบคุมงานสั่งให้แก้ไขและทำการทดสอบซ้ำเนื่องจากงานที่ผู้รับเหมาทำไม่มีคุณภาพหรือไม่เป็นไปตามสัญญา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
12. การที่ผู้รับเหมาบกพร่องในการแก้ไขงานซึ่งมีข้อบกพร่องที่เกิดจากสาเหตุที่ผู้รับเหมาต้องรับผิดชอบ	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
13. การที่ผู้รับเหมาเปลี่ยนแปลงงานใหม่เพื่อแก้ไขปัญหาความล่าช้า โดยผู้รับเหมาเป็นผู้มีส่วนรับผิดชอบในความล่าช้าที่เป็นสาเหตุของการเปลี่ยนแปลงงานดังกล่าว	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
14. การที่ผู้รับเหมาดำเนินการก่อสร้างเสร็จช้ากว่ากำหนดเนื่องจากความบกพร่องของผู้รับเหมาเอง	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
15. การที่งานไม่ผ่านการทดสอบตรวจรับงาน แต่เจ้าของงานได้ตัดสินใจรับมอบงานนั้นไว้โดยหักค่าจ้างบางส่วน	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อเจ้าของงาน โดยเฉลี่ย
16. การที่งานก่อสร้างไม่สามารถใช้งานได้ตามวัตถุประสงค์ของงานก่อสร้างที่ตั้งไว้	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
17. การที่ผู้รับเหมาบกพร่องในการแก้ไขความชำรุด บกพร่องในช่วงระยะเวลารับประกันความชำรุด บกพร่อง	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
18. การที่บุคคลภายนอก Claim เจ้าของงาน เนื่องจากสาเหตุที่ผู้รับเหมาต้องรับผิดชอบ	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
19. การที่ผู้รับเหมาบกพร่องในการจัดการมรดกรรม ประกันภัยสำหรับงานก่อสร้าง ทรัพย์สินหรือ บุคลากรของเจ้าของงาน หรือบุคลากรของ ผู้รับเหมา ซึ่งสัญญากำหนดให้ผู้รับเหมาต้อง จัดหา	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
20. การที่ผู้รับเหมาไม่สามารถต่ออายุกรมธรรม์ ประกันภัยที่สัญญากำหนดให้ผู้รับเหมาต้องจัดหา เนื่องจากเกิดการเปลี่ยนแปลงเงื่อนไขกรมธรรม์ ภายหลังจากที่ผู้รับเหมาได้จัดการมรดกรรม ดังกล่าวมาแล้วมากกว่าหนึ่งปี	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น

ตอนที่ 4

คำถามเกี่ยวกับการประเมินประสิทธิภาพ ของการจัดการการเรียกร้องสิทธิ (Claim Management)

คำชี้แจง :

คำถามในตอนนี้ เป็นคำถามแบบประมาณค่า กรุณาทำ “เครื่องหมายกากบาท (X)” ทับหมายเลข (0 ถึง 4) หรือ ตัวอักษร (N) ในแต่ละข้อ ซึ่งตรงกับความสามารถในการจัดการการ Claim โดยเฉลี่ยของโครงการซึ่งท่านเคยมี ประสบการณ์ สำหรับกระบวนการในคำถามแต่ละข้อ ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ต้องการออกความเห็น เกี่ยวกับคำถามดังกล่าว กรุณาเลือกตัวเลือก “ไม่ออกความเห็น (N)”

ตัวอย่าง :

ความสามารถ	ระดับของผลกระทบ
1.ความสามารถของพระสุนทรโวหาร (สุนทรภู่) ในการแต่งกลอนแปด	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>

ส่วนที่ 1 : การจัดการการ Claim ซึ่งเจ้าของงาน Claim ผู้รับเหมา (Employer's Claim)

ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงาน	ระดับของผลกระทบต่อ เจ้าของงาน
1.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการรับทราบสิทธิของเจ้าของงานในการ Claim ผู้รับเหมาที่เกิดขึ้น	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>
2.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการแจ้งการ Claim ของเจ้าของงานให้ผู้รับเหมาทราบตามวิธีและระยะเวลาที่สัญญาระบุ	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>
3.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการรวบรวมข้อมูลที่สำคัญเป็นต่อเจ้าของงานในการ Claim ผู้รับเหมา	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>
4.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการวิเคราะห์ว่าเจ้าของงานมีสิทธิในการ Claim หรือไม่ และจำนวนเงินหรือการชดเชยอื่นๆ ที่ควร Claim จากผู้รับเหมาควรเป็นเท่าใด	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>
5.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการกำหนดการชดเชย (เงินหรือการชดเชยอื่นๆ) ที่เจ้าของงานจะ Claim ผู้รับเหมาในการดำเนินการ Claim จริง	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>
6.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการเจรจาต่อรองกับผู้รับเหมาเกี่ยวกับการ Claim ของเจ้าของงานต่อผู้รับเหมา	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>

ส่วนที่ 2 : การจัดการการ Claim ซึ่งเจ้าของงานตรวจสอบการ Claim ของผู้รับเหมา (Contractor's Claim)

ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงาน	ระดับของผลกระทบต่อ เจ้าของงาน
7.ความสามารถของวิศวกรที่ปรึกษาหรือผู้ควบคุมงานในการรับทราบสิทธิของผู้รับเหมาในการ Claim ต่อเจ้าของงานล่วงหน้าการได้รับแจ้งการ Claim จากผู้รับเหมา	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">←</div> <div style="text-align: center;">→</div> <div style="margin-left: 20px;">ไม่ออก</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">ต่ำ</div> <div style="text-align: center;">สูง</div> <div style="margin-left: 20px;">ความเห็น</div> </div> <div style="display: flex; align-items: center; justify-content: space-between; margin-top: 5px;"> <div style="text-align: center;">(0)</div> <div style="text-align: center;">(1)</div> <div style="text-align: center;">(2)</div> <div style="text-align: center;">(3)</div> <div style="text-align: center;">(4)</div> <div style="text-align: center;">(N)</div> </div>

แบบสอบถาม
เรื่อง
การสำรวจข้อมูลที่ใช้ในการจัดการการเรียกร้องสิทธิ
ของเจ้าของงานก่อสร้าง

รหัสแบบสอบถาม GA-_____

วันที่ส่ง ___/___/___

ผู้ตอบแบบสอบถาม : บุคคลซึ่งมีประสบการณ์เกี่ยวกับการ Claim ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท เช่น ผู้จัดการโครงการของบริษัทวิศวกรที่ปรึกษาของโครงการ หัวหน้าของส่วนงานซึ่งดูแลเกี่ยวกับการควบคุมการก่อสร้างของหน่วยงาน หรือเจ้าของงานหรือตัวแทนของเจ้าของงานที่ได้รับมอบหมายให้ทำหน้าที่ดังกล่าว

คำชี้แจง :

แบบสอบถามชุดนี้ทำขึ้นโดยมีวัตถุประสงค์เพื่อทำการวิจัยเกี่ยวกับการจัดการการ Claim ของเจ้าของงานก่อสร้างเท่านั้น ข้อมูลที่ได้จากแบบสอบถามนี้ถือเป็นความลับซึ่งใช้เฉพาะในการศึกษานี้เท่านั้น ดังนั้น ขอความกรุณาท่าน โปรดตอบตามความเป็นจริง คำตอบของท่านจะเป็นประโยชน์อย่างยิ่งในการพัฒนาการจัดการการ Claim ของเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาให้มีประสิทธิภาพเพิ่มขึ้น มีความสะดวก และรวดเร็วยิ่งขึ้น ซึ่งย่อมส่งผลดีต่อตัวเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาเอง รวมถึงบุคคลผู้ซึ่งเกี่ยวข้องกับการจ้างงานก่อสร้างทุกฝ่ายในที่สุด

หากท่านต้องการข้อมูลเพิ่มเติม สอบถาม หรือ ให้คำแนะนำประการใด ขอความกรุณาติดต่อผู้จัดทำแบบสอบถาม ขอกราบขอบพระคุณในความร่วมมือของท่าน

กมลคุณท์ ไตชัยวัฒน์

นิสิตสาขาบริหารการก่อสร้าง

จุฬาลงกรณ์มหาวิทยาลัย

โทร. XX-XXX-XXXX

อีเมล: kongkoon@hotmail.com

หมายเหตุ :

1. ขอความกรุณาท่านช่วยตอบแบบสอบถามชุดนี้และส่งคืนมายังผู้จัดทำแบบสอบถาม เร็วที่สุดเท่าที่จะเป็นไปได้
2. เมื่อท่านทำแบบสอบถามชุดนี้เสร็จเรียบร้อยแล้ว กรุณาพับแบบสอบถามใส่ลงในซองไปรษณีย์ซึ่งส่งมาพร้อมแบบสอบถามฉบับนี้ และนำไปส่ง ณ ตู้ไปรษณีย์ ที่ใกล้ที่สุด ท่านไม่ต้องเสียค่าใช้จ่ายในการส่งแบบสอบถามนี้คืนผู้จัดทำแบบสอบถามแต่ประการใด

ตอนที่ 1

ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

คำชี้แจง : กรุณากรอกข้อมูลลงในที่ว่างทุกข้อ ข้อมูลของท่านทุกข้อมีความจำเป็นต่อการวิจัยนี้เป็นอย่างมาก

3. ชื่อผู้ตอบแบบสอบถาม _____
4. สถานที่ทำงาน _____ 3. ตำแหน่งปัจจุบัน _____
4. ระยะเวลาในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงาน ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท ประมาณ _____ ปี
5. มูลค่าโครงการสูงสุดที่เคยมีประสบการณ์ในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงาน ในโครงการก่อสร้าง ประมาณ _____ ล้านบาท

คำจำกัดความ :

1. “การ Claim ของเจ้าของงาน (Employer’s Claim)” หมายถึง การที่เจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย เรียกร้อง เงิน หรือการชดเชยอื่นๆ เช่น การขยายระยะเวลารับประกันความชำรุดบกพร่อง (ในบางสัญญา) การให้ปฏิบัติหรือละเว้นการปฏิบัติ การแก้ไขสัญญา หรือการยกเลิกสัญญา ทั้งที่มีระบุอยู่ในสัญญาและไม่มีระบุอยู่ในสัญญาแต่กฎหมายได้ระบุสิทธิดังกล่าวไว้ จากผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องกับโครงการก่อสร้าง
2. “การจัดการการ Claim ของเจ้าของงาน (Employer’s Claim Management)” หมายถึง กระบวนการซึ่งเจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย ใช้ในการดำเนินการและควบคุมการ Claim ทั้งในการที่เจ้าของงาน Claim ต่อผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้อง และการที่เจ้าของงานตรวจสอบการ Claim ของผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องต่อเจ้าของงาน
3. “วัสดุซึ่งเจ้าของงานเป็นผู้จัดหา (Employer’s Free-Issue Material)” หมายถึง วัสดุซึ่งเจ้าของงานและผู้รับเหมาตกลงกันว่า เจ้าของงานจะเป็นผู้จัดหาให้ เพื่อให้ผู้รับเหมาใช้ในงานก่อสร้าง
4. “เครื่องจักรซึ่งเจ้าของงานเป็นผู้จัดหา (Employer’s Equipment)” หมายถึง เครื่องมือ เครื่องจักร และยานพาหนะ ซึ่งเจ้าของงานและผู้รับเหมาตกลงกันว่า เจ้าของงานจะเป็นผู้จัดหาให้ เพื่อให้ผู้รับเหมาใช้ในงานก่อสร้าง
5. “ลูกจ้างของเจ้าของงาน (Employer’s Personnel)” หมายถึง วิศวกรที่ปรึกษา ผู้ควบคุมงาน และลูกจ้างอื่นๆ ของเจ้าของงานและวิศวกรที่ปรึกษาหรือผู้ควบคุมงานดังกล่าว

ตอนที่ 2

คำถามเกี่ยวกับการประเมินความสามารถ

ในการรวบรวมข้อมูลที่เป็นในการจัดการการเรียกร้องสิทธิ (Claim Management)

11. ข้อมูลจำนวนของวัสดุซึ่งเจ้าของเป็นผู้จัดหาซึ่งส่งคืนแก่เจ้าของงาน (Employer's Free-Issue Material Return to Employer)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

12. ข้อมูลชั่วโมงการทำงานจริงของเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Actual Hour)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

13. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการใช้งานเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Hourly Operating Cost)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

หมายเหตุ : ค่าใช้จ่ายในการใช้งานเครื่องจักร เป็นค่าใช้จ่ายที่เกิดขึ้นในการใช้งานเครื่องจักร ได้แก่ ค่าใช้จ่ายที่เกิดจากค่าบำรุงรักษา ค่าน้ำมัน ค่าน้ำมันเครื่องและสารหล่อลื่นต่างๆ

14. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการครอบครองเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Hourly Ownership Cost)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

หมายเหตุ : ค่าใช้จ่ายในการครอบครองเครื่องจักร ประกอบด้วย ค่าใช้จ่ายที่เกิดจากค่าเสื่อมราคา ค่าเก็บรักษา ค่าดอกเบี้ย ค่าความเสี่ยง ค่าภาษี และค่าประกันภัยเครื่องจักร

15. ข้อมูลอัตราค่าแรงของลูกจ้างของเจ้าของงาน (Employer's Personnel Rate)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

16. ข้อมูลจำนวนชั่วโมงการทำงานของลูกจ้างของเจ้าของงานที่ใช้ในงานเพิ่มเติม (Employer's Personnel Hours Used in Additional Work)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

17. ข้อมูลจำนวนชั่วโมงการทำงานของลูกจ้างของเจ้าของงานซึ่งใช้อัตราค่าแรงที่เพิ่มขึ้นจากตอนเริ่มโครงการ (Employer's Personnel Hours of Increased Rate)	หายากมาก หายาก หายากปานกลาง หาง่าย หาง่ายมาก	ไม่ออกความเห็น
	(0) (1) (2) (3) (4)	(N)

กลุ่มที่ 2 : ข้อมูลเกี่ยวกับผู้รับเหมา

18. ข้อมูลรายละเอียดของการ Claim ต่อผู้รับเหมา(ของโครงการปัจจุบัน) ในโครงการก่อนๆ (Claims against the Contractor in the Former Projects)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

19. ข้อมูลความสามารถและประสบการณ์ของผู้รับเหมา (Contractor's Information)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
---	---	-----------------------

20. ข้อมูลเกี่ยวกับความสามารถและประสบการณ์ของผู้รับเหมาซึ่งเจ้าของงานได้รับ (Contractor's Information the Employer Received)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

21. ข้อมูลต้นทุนของเงินทุนของผู้รับเหมา (Contractor's Cost of Capital)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

หมายเหตุ : ต้นทุนของเงินทุน เป็นค่าใช้จ่ายที่เกิดขึ้นในการจัดหาเงินมาลงทุน ได้แก่ ดอกเบี้ยสำหรับเงินที่กู้ยืมมา และผลตอบแทนที่จะต้องจ่ายให้แก่ผู้ถือหุ้นกรณีการออกหุ้นเพื่อนำเงินมาลงทุน

22. ข้อมูลจำนวนของลูกจ้างของผู้รับเหมาที่ทำงานในบริเวณสถานที่ก่อสร้างในแต่ละวัน (Number of Contractor's Personnel at Site)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

23. ข้อมูลมูลค่ารวมของโครงการทั้งหมดที่ผู้รับเหมาได้รับในปัจจุบัน (Total Price of Contracts the Contractor Receive)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
---	---	-----------------------

24. ข้อมูลรายละเอียดของงานซึ่งผู้รับเหมาทำ (Works Done by the Contractor)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
---	---	-----------------------

25. ข้อมูลเกี่ยวกับรายละเอียดของงานก่อสร้างซึ่งผู้รับเหมาได้รับก่อนเสนอราคา (Works Information the	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

32. ข้อมูลวันที่เจ้าของงานสามารถใช้งาน ก่อสร้างได้ (Date that the Work can be Used as Intended)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

35. ข้อมูลผลของการทดสอบงาน ก่อสร้าง (Test Result)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

36. ข้อมูลผลผลิตภาพโดยทั่วไปในการ ทำงานก่อสร้าง (Normal Productivity)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

หมายเหตุ : ผลผลิตภาพหาได้จากปริมาณงานที่คนงานหรือเครื่องจักรทำได้ในหนึ่งหน่วยเวลา

37. ข้อมูลผลผลิตภาพของการทำงาน ก่อสร้างในโครงการ (Productivity Records)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

หมายเหตุ : ผลผลิตภาพหาได้จากปริมาณงานที่คนงานหรือเครื่องจักรทำได้ในหนึ่งหน่วยเวลา

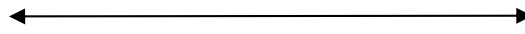
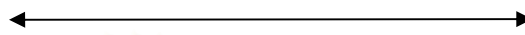

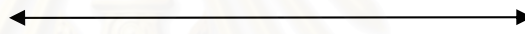
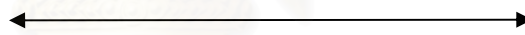
38. ข้อมูลอัตราผลตอบแทนที่ต้องการของ โครงการ (Required Rate of Return of Project)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

39. ข้อมูลราคาต่อหน่วยซึ่งได้ปรับราคา แล้ว (Adjusted Unit Cost of Works)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

40. ข้อมูลค่าเช่าเครื่องจักรโดยทั่วไป (Normal Equipment Rental Cost)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

41. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการใช้งาน เครื่องจักรโดยทั่วไป (Normal Hourly Equipment Operating Cost)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

หมายเหตุ : ค่าใช้จ่ายในการใช้งานเครื่องจักร เป็นค่าใช้จ่ายที่เกิดขึ้นในการใช้งานเครื่องจักร ได้แก่ ค่าใช้จ่ายที่
เกิดจากค่าบำรุงรักษา ค่าน้ำมัน ค่าน้ำมันเครื่องและสารหล่อลื่นต่างๆ

50. ข้อมูลข้อดี ข้อเสีย และข้อจำกัดของ เทคนิคการก่อสร้างใหม่ที่จะนำมาใช้ (Advantage, Disadvantage and Limitation of the New Technology)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
52. ข้อมูลวันที่รับเอกสาร (Date of Documents Received)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
53. ข้อมูลรายละเอียดของเอกสารที่ ได้รับ (Details of Documents Received)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
54. ข้อมูลวันที่ส่งเอกสาร (Date of Documents Submitted)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
55. ข้อมูลรายละเอียดของเอกสารที่ส่ง (Details of Documents Submitted)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

ตอนที่ 3

คำถามเกี่ยวกับการปัญหาของการจัดการการ Claim

คำชี้แจง :

คำถามต่อไปนี้ เป็นคำถามแบบเติมคำลงในช่องว่าง โปรดตอบตามความเป็นจริงและให้ข้อมูลมากที่สุดเท่าที่ท่านสามารถให้ได้ ข้อมูลที่ได้จากท่านมีประโยชน์ต่อการวิจัยครั้งนี้เป็นอย่างมาก

แบบสอบถาม
เรื่อง
การสำรวจข้อมูลที่ใช้ใน
การจัดการการ Claim ของเจ้าของงานก่อสร้าง

รหัสแบบสอบถาม GB- _____

วันที่ส่ง ____/____/____

ผู้ตอบแบบสอบถาม : บุคคลซึ่งมีประสบการณ์เกี่ยวกับการ Claim ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท เช่น ผู้จัดการโครงการของบริษัทวิศวกรที่ปรึกษาของโครงการ หัวหน้าของส่วนงานซึ่งดูแลเกี่ยวกับการควบคุมการก่อสร้างของหน่วยงาน หรือเจ้าของงานหรือตัวแทนของเจ้าของงานที่ได้รับมอบหมายให้ทำหน้าที่ดังกล่าว

คำชี้แจง :

แบบสอบถามชุดนี้ทำขึ้นโดยมีวัตถุประสงค์เพื่อทำการวิจัยเกี่ยวกับการจัดการการ Claim ของ เจ้าของงานก่อสร้างเท่านั้น ข้อมูลที่ได้จากแบบสอบถามนี้ถือเป็นความลับซึ่งใช้เฉพาะในการศึกษานี้เท่านั้น ดังนั้น ขอความกรุณาท่าน โปรดตอบตามความเป็นจริง คำตอบของท่านจะเป็นประโยชน์อย่างยิ่งในการพัฒนาการจัดการการ Claim ของเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาให้มีประสิทธิภาพเพิ่มขึ้น มีความสะดวก และรวดเร็วยิ่งขึ้น ซึ่งย่อมส่งผลดีต่อตัวเจ้าของงานก่อสร้าง และวิศวกรที่ปรึกษาเอง รวมถึงบุคคลผู้ซึ่งเกี่ยวข้องกับการจ้างงานก่อสร้างทุกฝ่ายในที่สุด

หากท่านต้องการข้อมูลเพิ่มเติม สอบถาม หรือ ให้คำแนะนำประการใด ขอความกรุณาติดต่อผู้จัดทำแบบสอบถาม ขอกราบขอบพระคุณในความร่วมมือของท่าน

กมลกoonท์ โตชัยวัฒน์
นิสิตสาขาบริหารการก่อสร้าง
จุฬาลงกรณ์มหาวิทยาลัย
โทร. XX-XXX-XXXX
อีเมล: kongkoon@hotmail.com

หมายเหตุ :

1. ขอความกรุณาท่านช่วยตอบแบบสอบถามชุดนี้และส่งคืนมายังผู้จัดทำแบบสอบถาม เร็วที่สุดเท่าที่จะเป็นไปได้
2. เมื่อท่านทำแบบสอบถามชุดนี้เสร็จเรียบร้อยแล้ว กรุณาพับแบบสอบถามใส่ลงในซองไปรษณีย์ซึ่งส่งมาพร้อมแบบสอบถามฉบับนี้ และนำไปส่ง ณ ตู้ไปรษณีย์ ที่ใกล้ที่สุด ท่านไม่ต้องเสียค่าใช้จ่ายในการส่งแบบสอบถามนี้คืนผู้จัดทำแบบสอบถามแต่ประการใด

ตอนที่ 1

ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

คำชี้แจง : กรุณากรอกข้อมูลลงในที่ว่างทุกข้อ ข้อมูลของท่านทุกข้อมีความจำเป็นต่อการวิจัยนี้เป็นอย่างมาก

5. ชื่อผู้ตอบแบบสอบถาม _____
6. สถานที่ทำงาน _____ 3. ตำแหน่งปัจจุบัน _____
4. ระยะเวลาในการทำงานด้านการควบคุมจัดการการกร Claim ของเจ้าของงานในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท ประมาณ _____ ปี
5. มูลค่าโครงการสูงสุดที่เคยมีประสบการณ์ในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงานในโครงการก่อสร้าง ประมาณ _____ ล้านบาท

คำจำกัดความ :

1. “การ Claim ของเจ้าของงาน (Employer’s Claim)” หมายถึง การที่เจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย เรียกร้อง เงิน หรือการชดเชยอื่นๆ เช่น การขยายระยะเวลารับประกันความชำรุดบกพร่อง (ในบางสัญญา) การให้ปฏิบัติหรือละเว้นการปฏิบัติ การแก้ไขสัญญา หรือการยกเลิกสัญญา ทั้งที่มีระบุอยู่ในสัญญาและไม่มีระบุอยู่ในสัญญาแต่กฎหมายได้ระบุสิทธิดังกล่าวไว้ จากผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องกับโครงการก่อสร้าง
2. “การจัดการการ Claim ของเจ้าของงาน (Employer’s Claim Management)” หมายถึง กระบวนการซึ่งเจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย ใช้ในการดำเนินการและควบคุมการ Claim ทั้งในการที่เจ้าของงาน Claim ผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้อง และการที่เจ้าของงานตรวจสอบการ Claim ของผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องต่อเจ้าของงาน
3. “ผู้ควบคุมงาน” ในแบบสอบถามชุดนี้ หมายความว่า วิศวกรที่ปรึกษา ผู้ควบคุมงาน หรือผู้มีหน้าที่ในการจัดการการ Claim ของเจ้าของงาน (Employer’s Claim Management)

ตอนที่ 2

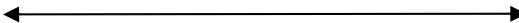



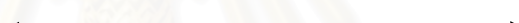



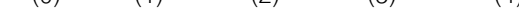
คำถามเกี่ยวกับการประเมินความสามารถ

ในการรวบรวมข้อมูลที่จำเป็นในการจัดการการ Claim

คำชี้แจง :

คำถามในตอนนี้ เป็นคำถามแบบประมาณค่า กรุณาทำ “เครื่องหมายกากบาท (X)” ทับหมายเลข (0 ถึง 4) หรือตัวอักษร(N) ในแต่ละข้อ ซึ่งตรงกับความสามารถในการจัดหาข้อมูลของวิศวกรที่ปรึกษาหรือผู้ควบคุมงาน สำหรับโครงการซึ่งท่านเคยมีประสบการณ์ สำหรับข้อมูลที่จำเป็นในการจัดการการ Claim ในคำถามแต่ละข้อ โดยที่

ก. หมายเลข 0 ถึง 4 มีความหมาย ดังต่อไปนี้

7. ข้อมูลสภาพแวดล้อมภายในบริเวณใกล้เคียงสถานที่ก่อสร้าง (Site Condition of Neighborhood Sites)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
8. ข้อมูลรายละเอียดของสาเหตุของความชำรุดบกพร่องในงานก่อสร้างที่เกิดขึ้น (Cause of Deficiency in Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
9. ข้อมูลรายละเอียดของความชำรุดบกพร่องในงานก่อสร้าง (Details of Deficiency in Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
10. ข้อมูลรายละเอียดของปัญหาในการทำงานก่อสร้าง (Problem to Perform the Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
11. ข้อมูลรายละเอียดของปัญหาของเจ้าของงานในการใช้งานก่อสร้างภายหลังการรับมอบงานก่อสร้าง (Problem of Use of Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
12. ข้อมูลระยะเวลาซึ่งงานก่อสร้างไม่สามารถใช้งานได้ตามวัตถุประสงค์ภายหลังการรับมอบงานก่อสร้าง (Duration the Work can not be Used as Its Purpose)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
13. ข้อมูลจำนวนวันที่ล่าช้าที่ผู้รับเหมาต้องรับผิดชอบ (Delay Duration Attributable to the Contractor)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
14. ข้อมูลรายละเอียดของสาเหตุของความล่าช้าที่เกิดขึ้น (Reasons of Delays)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
15. ข้อมูลวันที่เจ้าของงานใช้งานก่อสร้างแต่ละครั้งก่อนที่จะรับมอบงาน (Date of Each Use of Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

25. ข้อมูลรายละเอียดของการ Claim ต่อผู้ควบคุมงาน(ของโครงการปัจจุบัน) ในอดีต (Claims against the Engineer in the Former Projects)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
26. ข้อมูลเกี่ยวกับความสามารถและประสบการณ์ของผู้ออกแบบ (Designer's Information)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
28. ข้อมูลวันที่ผู้ควบคุมงานหรือเจ้าของงานออกคำสั่งแก่ผู้รับเหมา (Date of Instructions Issued)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
29. ข้อมูลรายละเอียดของคำสั่งจากผู้ควบคุมงานหรือเจ้าของงานถึงผู้รับเหมา (Details of Instruction Issued)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

กลุ่มที่3 : ข้อมูลเกี่ยวกับการจ่ายเงินหรือราคาสัญญา

30. ข้อมูลประมาณการจำนวนเงินที่ต้องจ่ายให้แก่ผู้รับเหมารายอื่นในการทำงานของผู้รับเหมาเดิมให้เสร็จ ในกรณีที่ผู้รับเหมาเดิมทิ้งงาน (Estimated Payment to Other Contractors)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
31. ข้อมูลรายละเอียดของวิธีการคิดค่าจ้างในโครงการอื่นๆ (Payment Practice for Similar Works in Other Projects)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
32. ข้อมูลมูลค่างานที่คิดตอนเริ่มโครงการ (Original Value of Works)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
33. ข้อมูลจำนวนเงินที่เจ้าของงานจ่ายไปแล้วทั้งหมด (Payment Amount)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

34. ข้อมูลวันที่เจ้าของงานจ่ายเงิน (Payment Date)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
35. ข้อมูลวัตถุประสงค์ของเจ้าของงาน ในการจ่ายเงิน (Payment Purpose)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
36. ข้อมูลรายชื่อของผู้ที่รับเงินจาก เจ้าของงาน (Payment to Whom)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
37. ข้อมูลจำนวนเงินที่เจ้าของงานได้รับ (Received Payment Amount)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
38. ข้อมูลวันที่เจ้าของงานได้รับเงิน (Received Payment Date)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
39. ข้อมูลรายชื่อของผู้ที่จ่ายเงินให้ เจ้าของงาน (Received Payment from Whom)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
40. ข้อมูลวัตถุประสงค์ของการจ่ายเงิน ให้เจ้าของงาน (Received Payment Purpose)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

กลุ่มที่ 4 : ข้อมูลเกี่ยวกับความสัมพันธ์ระหว่างผู้ที่เกี่ยวข้องกับงานก่อสร้าง

41. ข้อมูลความสามารถของผู้ควบคุมงาน ในการทำงานร่วมกับผู้รับเหมาในอดีต (Relationship between the other Contractors and the Engineer in the Former Projects)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
--	---	-----------------------

42. ข้อมูลความสามารถในการทำงานร่วมกันระหว่างผู้รับเหมา(ของโครงการปัจจุบัน) และผู้ออกแบบ (ของโครงการปัจจุบัน) ในอดีต (Relationship between the Contractor and Designer in the Former Projects)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

43. ข้อมูลความสามารถในการทำงานร่วมกันระหว่างผู้ออกแบบและผู้รับเหมาของโครงการ (Relationship between Designer and Contractor in the Project)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

44. ข้อมูลความร่วมมือกันระหว่างเจ้าของงานและบุคคลที่สามอื่นๆ ที่เกี่ยวข้อง (Relationship between Employer and Third Party)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

หมายเหตุ : บุคคลที่สาม ได้แก่ บุคคลอื่นๆ นอกเหนือจากเจ้าของงาน ผู้รับเหมา ลูกจ้างของเจ้าของงาน และลูกจ้างของผู้รับเหมา

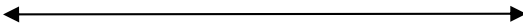




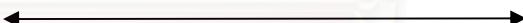


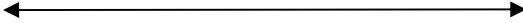
กลุ่มที่5 : ข้อมูลอื่นๆ

45. ข้อมูลราคาที่เสนอประมูล (ในอดีต) ของผู้รับเหมาแต่ละรายที่เข้าร่วมประมูลในโครงการในอดีต (Bid Price of Each Contractor in Past Bidding Project)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

46. ข้อมูลราคาที่เสนอประมูลของผู้รับเหมาแต่ละรายในโครงการปัจจุบัน (Bid Price of Each Contractor)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

47. ข้อมูลรายละเอียดของกฎหมายหรือระเบียบข้อบังคับที่เกี่ยวข้องกับการก่อสร้าง (Law or Regulation)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

48. ข้อมูลวันที่เกิดการเปลี่ยนแปลงกฎหมายหรือระเบียบข้อบังคับ (Date of Law and Regulation Changed)	หายากมาก	หายาก	หายากปานกลาง	หาง่าย	หาง่ายมาก	ไม่ออกความเห็น (N)
	(0)	(1)	(2)	(3)	(4)	

49. ข้อมูลรายละเอียดของกฎหมายและระเบียบข้อบังคับที่เปลี่ยนแปลง (Details of Law and Regulation Changed)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
50. ข้อมูลรายละเอียดของมาตรฐานที่ใช้ในการก่อสร้าง (Standard)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
51. ข้อมูลรายละเอียดของเอกสารสัญญา (Details of Contract Documents)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
52. ข้อมูลรายละเอียดของงานที่ผู้รับเหมา ช่วงทำ (Details of Works Done by the Subcontractor)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
54. ข้อมูลความเห็นของผู้เชี่ยวชาญด้านวิศวกรรม (Engineering Expert's Opinion)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
55. ข้อมูลความเห็นของผู้เชี่ยวชาญด้านกฎหมาย (Law Expert's Opinion)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
56. ข้อมูลความเห็นของผู้เชี่ยวชาญด้านการเงิน (Financial Expert's Opinion)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
57. ข้อมูลอัตราดอกเบี้ยของธนาคารแห่งประเทศไทย (Interest Rate of Central Bank)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)
58. ข้อมูลประมาณการอัตราดอกเบี้ยของธนาคารแห่งประเทศไทยในอนาคต (Expected Interest Rate of Central Bank at Profit Loss Project Duration)	หายากมาก หายาก หายากปานกลาง ง่าย ง่ายมาก (0) (1) (2) (3) (4) 	ไม่ออกความเห็น (N)

แบบสอบถาม
เรื่อง
การสำรวจการ Claim
ของผู้รับเหมาก่อสร้าง

รหัสแบบสอบถาม CX- _____

วันที่ส่ง ____/____/____

ผู้ตอบแบบสอบถาม : บุคคลซึ่งมีประสบการณ์ในเกี่ยวกับการ Claim ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท เช่น ผู้จัดการโครงการ เจ้าของหรือตัวแทนของเจ้าของบริษัทผู้รับเหมาที่ได้รับมอบหมายให้ทำหน้าที่ดังกล่าว

คำชี้แจง :

แบบสอบถามชุดนี้ทำขึ้นเพื่อวัตถุประสงค์เพื่อทำการวิจัยเกี่ยวกับการ Claim และการจัดการการ Claim ของผู้รับเหมาก่อสร้างเท่านั้น ข้อมูลที่ได้จากแบบสอบถามนี้ถือเป็นความลับซึ่งใช้เฉพาะในการศึกษานี้เท่านั้น ดังนั้น ขอความกรุณาท่าน โปรดตอบตามความเป็นจริง คำตอบของท่านจะเป็นประโยชน์อย่างยิ่งในการพัฒนาการจัดการการ Claim ให้มีประสิทธิภาพและมีความยุติธรรมมากขึ้น ซึ่งย่อมส่งผลดีต่อตัวผู้รับเหมาก่อสร้างเอง รวมถึงบุคคลผู้ซึ่งเกี่ยวข้องกับงานก่อสร้าง ทุกฝ่ายในที่สุด

หากท่านต้องการข้อมูลเพิ่มเติม สอบถาม หรือ ให้คำแนะนำประการใด ขอความกรุณาติดต่อผู้จัดทำแบบสอบถาม ขอกราบขอบพระคุณในความร่วมมือของท่าน

กมลกoon ตรีชัยวัฒน์
นิสิตสาขาบริหารการก่อสร้าง
จุฬาลงกรณ์มหาวิทยาลัย
โทร. XX-XXX-XXXX
อีเมล: kongkoon@hotmail.com

หมายเหตุ :

1. ขอความกรุณาท่านช่วยตอบแบบสอบถามชุดนี้และส่งคืนมายังผู้จัดทำแบบสอบถาม **เร็วที่สุดเท่าที่จะเป็นไปได้**
2. เมื่อท่านทำแบบสอบถามชุดนี้เสร็จเรียบร้อยแล้ว กรุณาพับแบบสอบถามใส่ลงในซองไปรษณีย์ซึ่งส่งมาพร้อมแบบสอบถามฉบับนี้ และนำไปส่ง ณ ตู้ไปรษณีย์ ที่ใกล้ที่สุด ท่านไม่ต้องเสียค่าใช้จ่ายในการส่งแบบสอบถามนี้คืนผู้จัดทำแบบสอบถามแต่ประการใด

ตอนที่ 1

ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

คำชี้แจง : กรุณากรอกข้อมูลลงในที่ว่างทุกข้อ ข้อมูลของท่านทุกข้อมีความจำเป็นต่อการวิจัยนี้เป็นอย่างมาก

7. ชื่อผู้ตอบแบบสอบถาม _____
8. สถานที่ทำงาน _____ 3. ตำแหน่งปัจจุบัน _____
4. ระยะเวลาในการทำงานด้านการควบคุมการจัดการการ Claim ของผู้รับเหมา (Contractor's Claim Management) ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท ประมาณ _____ ปี
5. มูลค่าโครงการสูงสุดในการทำงานด้านการควบคุมการจัดการการ Claim ของผู้รับเหมา (Contractor's Claim Management) ในโครงการก่อสร้าง ประมาณ _____ ล้านบาท

คำจำกัดความ :

1. “การ Claim ของผู้รับเหมา (Contractor's Claim)” หมายถึง การที่ผู้รับเหมาเรียกร้อง เงิน การขยายระยะเวลา ก่อสร้าง หรือการชดเชยอื่นๆ เช่น การให้ปฏิบัติหรือละเว้นการปฏิบัติ การแก้ไขสัญญา หรือการยกเลิกสัญญา ทั้งที่มีระบุอยู่ในสัญญาและไม่มีระบุอยู่ในสัญญาแต่กฎหมายได้ระบุสิทธิดังกล่าวไว้ จากเจ้าของงานหรือบุคคลอื่นที่เกี่ยวข้องกับโครงการก่อสร้าง
2. “การจัดการการ Claim ของผู้รับเหมา (Contractor's Claim Management)” หมายถึง กระบวนการซึ่งผู้รับเหมาใช้ ในการดำเนินการและควบคุมการ Claim ทั้งในการที่ผู้รับเหมา Claim ต่อเจ้าของงานหรือบุคคลอื่นที่เกี่ยวข้อง และการที่ผู้รับเหมาตรวจสอบการ Claim ของเจ้าของงานหรือบุคคลอื่นที่เกี่ยวข้องต่อผู้รับเหมา

ตอนที่ 2

ประสพการณ์เกี่ยวกับสิทธิในการ Claim กลุ่มต่างๆ

คำชี้แจง :

- แบบสอบถามตอนนี้ ประกอบด้วยคำถามแบบเติมตัวเลขลงในช่องว่างและแบบประมาณค่า
- ก. กรุณาเติมตัวเลขลงในช่องว่างที่เว้นไว้ทุกช่อง ให้สอดคล้องกับจำนวนครั้งโดยเฉลี่ยต่อ 1 โครงการของเหตุการณ์แต่ละเหตุการณ์ที่ทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา
 - ข. กรุณาทำ “เครื่องหมายกากบาท (X)” ทับหมายเลข (0 ถึง 4) หรือ ตัวอักษร (N) ในแต่ละข้อ ซึ่งตรงกับระดับของผลกระทบโดยเฉลี่ยต่อเจ้าของงานถ้าเกิดขึ้น ของเหตุการณ์ที่ระบุในคำถามแต่ละข้อตามประสพการณ์และความเห็นของท่าน
 - ค. ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ต้องการออกความเห็นเกี่ยวกับคำถามดังกล่าว กรุณาเติมอักษร “ N “ ลงในช่องว่างสำหรับคำถามแบบเติมตัวเลขในช่องว่าง หรือเลือกตัวเลือก “ไม่ออกความเห็น (N)” สำหรับคำถามแบบประเมินค่า ตามแต่กรณี

ตัวอย่าง : จากประสบการณ์ของท่าน โปรดระบุจำนวนครั้งโดยเฉลี่ยซึ่งท่านคาดว่าจะเกิดขึ้นกับผู้ทำประกันชีวิตในการทำประกันชีวิตจำนวน 1 กรมธรรม์ และระดับของผลกระทบต่อผู้ทำประกันชีวิตโดยเฉลี่ยจากเหตุการณ์ดังกล่าว สำหรับเหตุการณ์ซึ่งทำให้ผู้ทำประกันชีวิตมีสิทธิ Claim บริษัทประกันชีวิตในแต่ละข้อ

เหตุการณ์ซึ่งทำให้ผู้ทำประกันชีวิตมีสิทธิ Claim บริษัทประกันชีวิต	ความถี่ของการเกิดโดยเฉลี่ย	ระดับของผลกระทบต่อผู้ทำประกันชีวิตโดยเฉลี่ย
1. การที่ผู้ทำประกันชีวิตต้องกลายเป็นคนพิการ	<u>0.05</u> ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N) <input checked="" type="checkbox"/> (4)
2. การที่ผู้ทำประกันชีวิตได้รับบาดเจ็บเล็กน้อย	<u>3</u> ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N) <input checked="" type="checkbox"/> (1)
3. การที่ผู้ทำประกันชีวิตได้ส่งเบี้ยประกันจนครบตามเงื่อนไขของกรมธรรม์แล้ว และเงื่อนไขของกรมธรรม์ระบุว่าผู้ทำประกันมีสิทธิได้รับเงินคืน	<u>N</u> ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N) <input checked="" type="checkbox"/> (0)

1. จากประสบการณ์ของท่าน โปรดระบุจำนวนครั้งโดยเฉลี่ยซึ่งท่านคาดว่าจะเกิดขึ้นในโครงการที่อยู่ในการปฏิบัติหน้าที่ของท่านจำนวน 1 โครงการ และระดับของผลกระทบต่อผู้รับเหมาโดยเฉลี่ยจากเหตุการณ์ดังกล่าว สำหรับเหตุการณ์ซึ่งทำให้ผู้รับเหมาสิทธิ Claim เจ้าของงานในแต่ละข้อ

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิดโดยเฉลี่ย	ระดับของผลกระทบต่อผู้รับเหมาโดยเฉลี่ย
1. การที่เจ้าของงานหรือลูกจ้างทำผิดเงื่อนไขในสัญญาข้อใดข้อหนึ่ง แต่สัญญาไม่ได้ระบุโดยชัดเจนว่าผู้รับเหมาสิทธิ Claim จากเจ้าของงาน	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N)
2. การที่ผู้รับเหมาได้ดำเนินการใดๆ ที่สัญญาไม่ได้กำหนดให้ต้องทำ แต่ก็ยังเป็นประโยชน์กับเจ้าของงาน	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N)
3. การที่เจ้าของงานกระทำการที่ผิดกฎหมายและทำให้เจ้าของงานเสียหาย	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N)
4. การที่เกิดเหตุการณ์ซึ่งทำให้การปฏิบัติตามสัญญาของเจ้าของงานหรือผู้รับเหมาไม่สามารถทำได้หรือไม่เป็นไปตามที่คาดไว้ในขณะที่ทำสัญญา และเหตุการณ์ดังกล่าวไม่สามารถคาดล่วงหน้าได้	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง (0) (1) (2) (3) (4) (N)

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อผู้รับเหมา โดยเฉลี่ย
5. การที่ข้อความในสัญญาไม่ตรงกับข้อตกลงระหว่างเจ้าของงานและผู้รับเหมา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
6. การที่ผู้รับเหมาเข้าใจผิดในเรื่องที่มีผลต่อการตัดสินใจทำสัญญากับเจ้าของงาน	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
7. การที่เจ้าของงานกระทำหรือไม่กระทำสิ่งใด ซึ่งอาจทำให้ผู้รับเหมาเสียหาย	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
8. การที่พบความคลาดเคลื่อนของข้อมูลที่มีผลต่อการทำงานซึ่งผู้รับเหมาได้รับจากเจ้าของงานก่อนทำสัญญากัน	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
9. การที่ผู้รับเหมาขอความเห็นใจจากเจ้าของงาน โดย Claim ในสาเหตุซึ่งไม่ได้เป็นความรับผิดชอบของผู้รับเหมา	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
10. การที่เจ้าของงานหรือผู้ควบคุมงานออกคำสั่งหรือจัดทำแบบก่อสร้างเพิ่มเติมที่ผู้รับเหมาร้องขอล่าช้า	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
11. การที่เจ้าของงานส่งมอบพื้นที่ก่อสร้างให้ผู้รับเหมาล่าช้า	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
12. การที่มีข้อบกพร่องในแบบก่อสร้างหรือข้อมูลเกี่ยวกับตำแหน่งอ้างอิงต่างๆ ซึ่งแม้แต่ผู้รับเหมาที่มีประสบการณ์สูงก็ไม่สามารถทราบล่วงหน้าได้	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
13. การที่ผู้รับเหมาพบสภาพแวดล้อมซึ่งเป็นอุปสรรคในการทำงาน และแม้แต่ผู้รับเหมาที่มีประสบการณ์สูงไม่สามารถทราบสภาพดังกล่าวล่วงหน้าได้	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>
14. การที่พบวัตถุซึ่งมีค่าทางภูมิศาสตร์หรือทางโบราณคดีในบริเวณสถานที่ก่อสร้าง และเจ้าของงานหรือผู้ควบคุมงานออกคำสั่งเพิ่มเติมให้ผู้รับเหมาดูแลรักษาหรือป้องกันความเสียหายที่จะเกิดกับวัตถุดังกล่าว	_____ ครั้ง	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">←————→</div> <div style="text-align: right;">ไม่ออก</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">ไม่มีผล</div> <div style="text-align: center;">มีผลอย่างยิ่ง</div> <div style="text-align: right;">ความเห็น</div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">(0) (1) (2) (3) (4)</div> <div style="text-align: right;">(N)</div> </div>

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อผู้รับเหมา โดยเฉลี่ย
15.การที่เกิดเหตุสุดวิสัย (เหตุการณ์ไม่คาดฝัน ซึ่งทั้งเจ้าของงานและผู้รับเหมาไม่สามารถควบคุมหรือหลีกเลี่ยงได้ และไม่เป็นความรับผิดชอบของคู่สัญญาฝ่ายใด)	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
16.การที่เจ้าของงานหรือผู้ควบคุมงานสั่งเปลี่ยนแปลงงานหรือเกิดการเปลี่ยนแปลงปริมาณงานจำนวนมาก	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
17.การเกิดสภาพอากาศที่ผิดปกติซึ่งเป็นอุปสรรคในการดำเนินการก่อสร้าง	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
18.การขาดแคลนบุคลากรหรือวัสดุก่อสร้างซึ่งแม้ผู้รับเหมาที่มีประสบการณ์สูงก็ไม่สามารถคาดล่วงหน้าได้	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
19.การที่เจ้าของงาน ผู้ควบคุมงาน ผู้รับเหมา รายอื่นหรือลูกจ้างอื่นๆ ของเจ้าของงานกีดขวางการทำงานของผู้รับเหมา	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
20.การหน่วยงานของรัฐกีดขวางการทำงานของ ผู้รับเหมาแม้ว่าผู้รับเหมาจะปฏิบัติตามกฎระเบียบข้อบังคับอย่างถูกต้องแล้ว และแม้แต่ผู้รับเหมาที่มีประสบการณ์สูงก็ไม่สามารถคาดการณ์กีดขวางดังกล่าวล่วงหน้าได้	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
21.การที่เจ้าของงานหรือผู้ควบคุมงานสั่งให้ ผู้รับเหมาหยุดงานชั่วคราวด้วยสาเหตุที่ผู้รับเหมาไม่ต้องรับผิดชอบ	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
22.การที่เจ้าของงานได้ใช้การงานก่อสร้างก่อนการส่งมอบหรือใช้งานโดยผิดวัตถุประสงค์	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น
23.การที่เจ้าของงานหรือผู้ควบคุมงานกีดขวางการทดสอบเพื่อส่งมอบงานของผู้รับเหมา และผู้รับเหมาไม่ต้องรับผิดชอบต่อการกีดขวางดังกล่าว	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) (N) ความเห็น

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อผู้รับเหมา โดยเฉลี่ย
24.การที่ผู้รับเหมาทำการค้นหาจุดบกพร่องในงานก่อสร้างตามคำสั่งของเจ้าของงานหรือผู้ควบคุมงาน แล้วพบว่า จุดบกพร่องดังกล่าวเกิดจากสาเหตุซึ่งผู้รับเหมาไม่ต้องรับผิดชอบ	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
25.การที่เกิดเหตุสุดวิสัย (เหตุการณ์ไม่คาดฝันซึ่งทั้งเจ้าของงานและผู้รับเหมาไม่สามารถควบคุมหรือหลีกเลี่ยงได้ และไม่ได้รับความรับผิดชอบของคู่สัญญาฝ่ายใด)	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
26.การที่ผู้รับเหมาเสนอวิธีการเปลี่ยนแปลงงานซึ่งเป็นประโยชน์กับเจ้าของงาน ให้เจ้าของงานหรือผู้ควบคุมงาน	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
27.การที่เกิดการเปลี่ยนแปลงกฎหมาย ระเบียบข้อบังคับขึ้นภายหลังการประกวดราคา	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
28.การที่เจ้าของงานจ่ายค่าจ้างให้แก่ผู้รับเหมาล่าช้ากว่ากำหนดเวลาที่ระบุไว้ในสัญญา	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
29.การที่เจ้าของงานหรือผู้ควบคุมงานสั่งให้ผู้รับเหมาหยุดงานชั่วคราวด้วยสาเหตุซึ่งผู้รับเหมาไม่ต้องรับผิดชอบ	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
30.การที่บุคคลภายนอก Claim ผู้รับเหมา อันเนื่องมาจากสาเหตุที่เจ้าของงาน ผู้ควบคุมงาน หรือลูกจ้างอื่นๆ ของเจ้าของงานต้องเป็นผู้รับผิดชอบ	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>
31.การที่เกิดเหตุการณ์ซึ่งสัญญาระบุให้เจ้าของงานต้องรับผิดชอบต่อความเสียหายที่จะเกิดขึ้น เช่น การเกิดสงคราม การปฏิวัติ การประท้วง การระเบิด ภัยธรรมชาติ หรือความเสียหายเนื่องจากเจ้าของงาน เป็นต้น	_____ ครั้ง	<div style="display: flex; justify-content: space-between;"> ← → </div> <div style="display: flex; justify-content: space-between;"> ไม่มีผล มีผลอย่างยิ่ง ไม่ออกความเห็น </div> <div style="display: flex; justify-content: space-between;"> (0) (1) (2) (3) (4) (N) </div>

เหตุการณ์ซึ่งทำให้เจ้าของงานมีสิทธิ Claim ผู้รับเหมา	ความถี่ของการเกิด โดยเฉลี่ย	ระดับของผลกระทบต่อผู้รับเหมา โดยเฉลี่ย
32.การที่เจ้าของงานบกพร่องในการจัดการมรรยาธัม ประกันภัยต่างๆ เช่น การประกันภัยงานก่อสร้าง การประกันภัยทรัพย์สินและบุคลากรของเจ้าของงาน ซึ่งสัญญากำหนดให้เจ้าของงานจัดหา	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) ความเห็น (N)
33.การที่เกิดเหตุสุดวิสัย (เหตุการณ์ไม่คาดฝัน ซึ่งทั้งเจ้าของงานและผู้รับเหมาไม่สามารถควบคุมหรือหลีกเลี่ยงได้ และไม่เป็นการรับผิดชอบของผู้สัญญาฝ่ายใด)	_____ ครั้ง	←————→ ไม่มีผล มีผลอย่างยิ่ง ไม่ออก (0) (1) (2) (3) (4) ความเห็น (N)

ตอนที่ 4

คำถามเกี่ยวกับการประเมินประสิทธิภาพของการจัดการการ Claim

คำชี้แจง :

คำถามในตอนนี้ เป็นคำถามแบบประมาณค่า กรุณาทำ "เครื่องหมายกากบาท (X)" ทับหมายเลข (0 ถึง 4) หรือ ตัวอักษร (N) ในแต่ละข้อ ซึ่งตรงกับความสามารถในการจัดการการ Claim โดยเฉลี่ยของโครงการซึ่งท่านเคยมี ประสบการณ์ สำหรับกระบวนการย่อยในคำถามแต่ละข้อ ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ต้องการออกความเห็น เกี่ยวกับคำถามดังกล่าว กรุณาเลือกตัวเลือก "ไม่ออกความเห็น (N)"

ตัวอย่าง :

ความสามารถ	ระดับของผลกระทบ
1.ความสามารถของพระสุนทรโวหาร (สุนทรภู่) ในการแต่งกลอนแปด	←————→ ต่ำ สูง ไม่ออก (0) (1) (2) (3) (4) ความเห็น (N)

ส่วนที่ 1 : การจัดการการ Claim ซึ่งผู้รับเหมา Claim เจ้าของงาน (Contractor's Claim)

ความสามารถของผู้รับเหมา	ระดับของผลกระทบต่อผู้รับเหมา
1.ความสามารถของผู้รับเหมาในการรับทราบสิทธิในการ Claim เจ้าของงานที่เกิดขึ้น	←————→ ต่ำ สูง ไม่ออก (0) (1) (2) (3) (4) ความเห็น (N)
2.ความสามารถของผู้รับเหมาในการแจ้งการ Claim ให้เจ้าของงานทราบตามวิธีและระยะเวลาที่สัญญาระบุ	←————→ ต่ำ สูง ไม่ออก (0) (1) (2) (3) (4) ความเห็น (N)

ความสามารถของผู้รับเหมา	ระดับของผลกระทบต่อผู้รับเหมา
3.ความสามารถความสามารถของผู้รับเหมาในการรวบรวมข้อมูลที่จำเป็นในการ Claim ต่อเจ้าของงาน	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
4.ความสามารถของผู้รับเหมาในการวิเคราะห์ว่าตนมีสิทธิในการ Claim หรือไม่ และจำนวนเงินหรือการชดเชยอื่นๆ ที่ควร Claim จากเจ้าของงานควรเป็นเท่าใด	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
5.ความสามารถของผู้รับเหมาในการกำหนดการชดเชย (เงิน การขยายระยะเวลาก่อสร้าง หรือการชดเชยอื่นๆ) ที่ผู้รับเหมาจะ Claim จากเจ้าของงานในการดำเนินการ Claim จริง	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
6.ความสามารถความสามารถของผู้รับเหมาในการเจรจาต่อรองกับเจ้าของงานเกี่ยวกับการ Claim ของผู้รับเหมาต่อเจ้าของงาน	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)

ส่วนที่ 2 : การจัดการการ Claim ซึ่งผู้รับเหมาตรวจสอบการ Claim ของเจ้าของงาน (Employer's Claim)

ความสามารถของผู้รับเหมา	ระดับของผลกระทบต่อผู้รับเหมา
7.ความสามารถของผู้รับเหมาในการรับทราบสิทธิของเจ้าของงานในการ Claim ผู้รับเหมาล่วงหน้าการได้รับแจ้งการ Claim จากเจ้าของงานหรือผู้ควบคุมงาน	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
8.ความสามารถของผู้รับเหมาในการรวบรวมข้อมูลที่จำเป็นในการตรวจสอบการ Claim ของเจ้าของงานต่อผู้รับเหมา	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
9.ความสามารถของผู้รับเหมาในการตรวจสอบการ Claim ของเจ้าของงานต่อผู้รับเหมาว่าเจ้าของงานมีสิทธิในการได้รับการชดเชยหรือไม่ และจำนวนเงินหรือการชดเชยอื่นๆ ที่เจ้าของงานควรได้รับเป็นเท่าใด	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)
10.ความสามารถของผู้รับเหมาในการเจรจาต่อรองกับเจ้าของงานเกี่ยวกับการ Claim ของเจ้าของงานต่อผู้รับเหมา	←→ ไม่ออก ต่ำ สูง ความเห็น (0) (1) (2) (3) (4) (N)

ตอนที่ 5

ปัญหาในการจัดการการ Claim

แบบสอบถาม
เรื่อง
ระบบจัดการการเรียกร้องสิทธิ
สำหรับเจ้าของโครงการก่อสร้าง

รหัสแบบสอบถาม VX-_____

วันที่ส่ง 7 / 11 / 2548

ผู้ตอบแบบสอบถาม : ผู้เข้าร่วมการสัมมนาเรื่อง “ระบบจัดการการเรียกร้องสิทธิสำหรับเจ้าของโครงการก่อสร้าง (Claim Management System for Construction Project Employer)”

คำชี้แจง :

แบบสอบถามชุดนี้ทำขึ้นโดยมีวัตถุประสงค์เพื่อทำการวิจัยเกี่ยวกับการจัดการการ Claim ของเจ้าของงานก่อสร้างเท่านั้น ข้อมูลที่ได้จากแบบสอบถามนี้ถือเป็นความลับซึ่งใช้เฉพาะในการศึกษานี้เท่านั้น ดังนั้น ขอความกรุณาท่าน โปรดตอบตามความเป็นจริง คำตอบของท่านจะเป็นประโยชน์อย่างยิ่งในการพัฒนาการจัดการการ Claim ของเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาให้มีประสิทธิภาพเพิ่มขึ้น มีความสะดวก และรวดเร็วยิ่งขึ้น ซึ่งย่อมส่งผลดีต่อตัวเจ้าของงานก่อสร้างและวิศวกรที่ปรึกษาเอง รวมถึงบุคคลผู้ซึ่งเกี่ยวข้องกับการจ้างงานก่อสร้างทุกฝ่ายในที่สุด

หากท่านต้องการข้อมูลเพิ่มเติม สอบถาม หรือ ให้คำแนะนำประการใด ขอความกรุณาติดต่อผู้จัดทำแบบสอบถาม ขอกราบขอบพระคุณในความร่วมมือของท่าน

กนกกoonท์ โตชัยวัฒน์
นิสิตสาขาบริหารการก่อสร้าง
จุฬาลงกรณ์มหาวิทยาลัย
โทร. XX-XXX-XXXX
อีเมลล์: kongkoon@gmail.com

หมายเหตุ :

1. ขอความกรุณาท่านช่วยตอบแบบสอบถามชุดนี้และส่งคืนมายังผู้จัดทำแบบสอบถามหลังการสัมมนา
2. หากท่านมีข้อสงสัยประการใด กรุณาสอบถามผู้จัดทำแบบสอบถาม

ตอนที่ 1

ข้อมูลเกี่ยวกับผู้ตอบแบบสอบถาม

คำชี้แจง : กรุณากรอกข้อมูลลงในที่ว่างทุกข้อ ข้อมูลของท่านทุกข้อมีความจำเป็นต่อการวิจัยนี้เป็นอย่างมาก

9. ชื่อผู้ตอบแบบสอบถาม _____
10. สถานที่ทำงาน _____ 3. ตำแหน่งปัจจุบัน _____
4. ระยะเวลาในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงาน ในโครงการก่อสร้างที่มีมูลค่ามากกว่า 20 ล้านบาท ประมาณ _____ ปี
5. มูลค่าโครงการสูงสุดที่เคยมีประสบการณ์ในการทำงานด้านการควบคุมจัดการการ Claim ของเจ้าของงาน ในโครงการก่อสร้าง ประมาณ _____ ล้านบาท

คำจำกัดความ :

1. “การ Claim ของเจ้าของงาน (Employer’s Claim)” หมายถึง การที่เจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย เรียกร้อง เงิน หรือการชดเชยอื่นๆ เช่น การขยายระยะเวลารับประกันความชำรุดบกพร่อง (ในบางสัญญา) การให้ปฏิบัติหรือละเว้นการปฏิบัติ การแก้ไขสัญญา หรือการยกเลิกสัญญา ทั้งที่มีระบุอยู่ในสัญญาและไม่มีระบุอยู่ในสัญญาแต่กฎหมายได้ระบุสิทธิดังกล่าวไว้ จากผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องกับโครงการก่อสร้าง
2. “การจัดการการ Claim ของเจ้าของงาน (Employer’s Claim Management)” หมายถึง กระบวนการซึ่งเจ้าของงาน วิศวกรที่ปรึกษา หรือผู้ที่ได้รับมอบหมาย ใช้ในการดำเนินการและควบคุมการ Claim ทั้งในการที่เจ้าของงาน Claim ต่อผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้อง และการที่เจ้าของงานตรวจสอบการ Claim ของผู้รับเหมาหรือบุคคลอื่นที่เกี่ยวข้องต่อเจ้าของงาน

ตอนที่ 2

คำถามเกี่ยวกับการประเมินผลลัพธ์ที่ได้จากการวิจัย

คำชี้แจง :

คำถามในตอนนี้ เป็นคำถามแบบประมาณค่า กรุณเติมหมายเลข 0 ถึง 4 หรือ “N” ในที่ว่างที่เว้นไว้ให้ในแต่ละข้อ ซึ่งตรงกับระดับความถูกต้อง ความน่าเชื่อถือ และประโยชน์ของผลลัพธ์ที่ได้จากการวิจัยในคำถามแต่ละข้อ โดยที่

ก. หมายเลข 0 ถึง 4 มีความหมาย ดังต่อไปนี้

หมายเลข	ระดับความเห็น	ความหมาย
0	ต่ำมาก	มีระดับ ความถูกต้อง/ ความน่าเชื่อถือ/ ประโยชน์ (ขึ้นกับคำถาม) ต่ำมาก
1	ต่ำ	มีระดับ ความถูกต้อง/ ความน่าเชื่อถือ/ ประโยชน์ (ขึ้นกับคำถาม) ต่ำ
2	ปานกลาง	มีระดับ ความถูกต้อง/ ความน่าเชื่อถือ/ ประโยชน์ (ขึ้นกับคำถาม) ปานกลาง
3	สูง	มีระดับ ความถูกต้อง/ ความน่าเชื่อถือ/ ประโยชน์ (ขึ้นกับคำถาม) สูง
4	สูงมาก	มีระดับ ความถูกต้อง/ ความน่าเชื่อถือ/ ประโยชน์ (ขึ้นกับคำถาม) สูงมาก

ข. ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ต้องการออกความเห็นเกี่ยวกับคำถามดังกล่าว กรุณาเติมตัวอักษร "N" หรือเว้นว่างไว้

ค. หากท่านมีข้อเสนอแนะเพิ่มเติม กรุณากรอกรายละเอียดของข้อเสนอแนะดังกล่าวในช่องหมายเหตุในทำ คำถามแต่ละข้อ หรือ ในคำถามเกี่ยวกับข้อเสนอแนะเพิ่มเติมในตอนที 3

ตัวอย่าง

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
ตัวอย่าง 0. ทฤษฎีสัมพัทธภาพของไอน์สไตน์ รายละเอียด: $E=mc^2$ อ้างอิง: หนังสือฟิสิกส์4.....3.....N.....เป็นทฤษฎีที่ลึกซึ้งมาก.....

กลุ่มที่1: องค์ประกอบของค่าใช้จ่าย

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
1. องค์ประกอบด้านค่าใช้จ่ายของการ เรียกร้องสิทธิของเจ้าของงาน (Employer's claim cost components) รายละเอียด: องค์ประกอบของจำนวนเงิน ที่เจ้าของงานสามารถเรียกร้องจาก ผู้รับเหมา เช่น ราคาวัดดูที่เจ้าของจัดหาที่ สูงขึ้น ค่าสินไหมทดแทน ค่าปรับ เป็นต้น อ้างอิง: SLIDE 28 - 31

กลุ่มที่2 : ข้อมูลในการเรียกร้องสิทธิ

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>2. รายชื่อข้อมูลในการเรียกร้องสิทธิ (List of claim data)</p> <p>รายละเอียด: ข้อมูลซึ่งจำเป็นในการเรียกร้องสิทธิจากผู้รับเหมา การตรวจสอบการเรียกร้องสิทธิของผู้รับเหมา และการรับรู้สิทธิในการเรียกร้องต่อผู้รับเหมาล่วงหน้า</p> <p>อ้างอิง: SLIDE 32 - 35</p>
<p>3. ดัชนีความสำคัญของข้อมูลการเรียกร้องสิทธิ (Claim Data Importance Index)</p> <p>รายละเอียด: ดัชนีซึ่งแสดงระดับความสำคัญของข้อมูลซึ่งจำเป็นในการเรียกร้องสิทธิจากผู้รับเหมา การตรวจสอบการเรียกร้องสิทธิของผู้รับเหมา และการรับรู้สิทธิในการเรียกร้องต่อผู้รับเหมาล่วงหน้า</p> <p>อ้างอิง: SLIDE 32 - 35</p>
<p>4. ดัชนีความง่ายในการรวบรวมของข้อมูลการเรียกร้องสิทธิ (Claim Data Availability Index)</p> <p>รายละเอียด: ดัชนีซึ่งแสดงระดับความง่ายในการรวบรวมข้อมูลซึ่งจำเป็นในการเรียกร้องสิทธิจากผู้รับเหมา การตรวจสอบการเรียกร้องสิทธิของผู้รับเหมา และการรับรู้สิทธิในการเรียกร้องต่อผู้รับเหมาล่วงหน้า</p> <p>อ้างอิง: SLIDE 32 - 35</p>

กลุ่มที่3: เหตุการณ์ซึ่งก่อให้เกิดการเรียกร้องสิทธิ

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>5. ดัชนีความถี่ของเหตุการณ์ซึ่งก่อให้เกิดการเรียกร้องสิทธิ (Claim Event Frequency Index)</p>

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>รายละเอียด: ดัชนีซึ่งแสดงระดับความบ่อยในการเกิดเหตุการณ์ซึ่งก่อให้เกิดสิทธิในการเรียกร้องของทั้งเจ้าของงาน และผู้รับเหมา</p> <p>อ้างอิง: SLIDE 82 - 86</p>			
<p>6. ดัชนีความรุนแรงของเหตุการณ์ซึ่งก่อให้เกิดการเรียกร้องสิทธิ (Claim Event Severity Index)</p> <p>รายละเอียด: ดัชนีซึ่งแสดงระดับความร้ายแรงของผลลัพธ์จากการเกิดเหตุการณ์ซึ่งก่อให้เกิดสิทธิในการเรียกร้องของทั้งเจ้าของงาน และผู้รับเหมาหนึ่งครั้ง</p> <p>อ้างอิง: SLIDE 82 - 86</p>
<p>7. ดัชนีผลกระทบของเหตุการณ์ซึ่งก่อให้เกิดการเรียกร้องสิทธิ (Claim Event Impact Index)</p> <p>รายละเอียด: ดัชนีซึ่งแสดงระดับความเสียหายของผลลัพธ์จากการเกิดเหตุการณ์ซึ่งก่อให้เกิดสิทธิในการเรียกร้องของทั้งเจ้าของงาน และผู้รับเหมาตลอดโครงการ</p> <p>อ้างอิง: SLIDE 82 - 86</p>

กลุ่มที่ 4: ระบบจัดการการเรียกร้องสิทธิซึ่งใช้อยู่ในปัจจุบัน

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>8. รายละเอียดของระบบจัดการการเรียกร้องสิทธิซึ่งใช้อยู่ในปัจจุบัน (Details of Existing Claim Management System)</p> <p>รายละเอียด: รายละเอียดของวิธีการจัดการการเรียกร้องสิทธิของหน่วยงานต่างๆ ทั้งภาครัฐและเอกชนในปัจจุบัน เช่น วิธีในการรับรู้สิทธิในการเรียกร้อง วิธีในการเก็บรวบรวมข้อมูล วิธีในการวิเคราะห์ เป็นต้น</p> <p>อ้างอิง: SLIDE 40 - 47</p>

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>9. ประสิทธิภาพของระบบจัดการการเรียกร้องสิทธิซึ่งใช้อยู่ในปัจจุบัน (Efficiency of Existing Claim Management System)</p> <p>รายละเอียด: ประสิทธิภาพของวิธีการจัดการการเรียกร้องสิทธิของหน่วยงานต่างๆ ทั้งภาครัฐและเอกชนในปัจจุบัน โดยประเมินโดยรวมและแยกพิจารณาขั้นตอนต่างๆ เช่น การรับรู้สิทธิในการเรียกร้อง การเก็บรวบรวมข้อมูล การวิเคราะห์ข้อมูล เป็นต้น</p> <p>อ้างอิง: SLIDE 48</p>
<p>10. ปัญหาของระบบจัดการการเรียกร้องสิทธิซึ่งใช้อยู่ในปัจจุบัน (Problems of Existing Claim Management System)</p> <p>รายละเอียด: ปัญหาในการจัดการการเรียกร้องสิทธิของหน่วยงานต่างๆ ทั้งภาครัฐและเอกชนในปัจจุบัน</p> <p>อ้างอิง: SLIDE 49 - 62</p>
<p>11. สาเหตุของปัญหาของระบบจัดการการเรียกร้องสิทธิซึ่งใช้อยู่ในปัจจุบัน (Causes of the Problems of Existing Claim Management System)</p> <p>รายละเอียด: สาเหตุของปัญหาในการจัดการการเรียกร้องสิทธิของหน่วยงานต่างๆ ทั้งภาครัฐและเอกชนในปัจจุบัน</p> <p>อ้างอิง: SLIDE 65 – 66</p>

กลุ่มที่ 5: รายชื่อเอกสารในการเรียกร้องสิทธิ

หัวข้อ	ถูกต้อง (0-4, N)	น่าเชื่อถือ (0-4, N)	ประโยชน์ (0-4, N)	หมายเหตุ
<p>12. รายชื่อเอกสารในการเรียกร้องสิทธิ (List of Claim Documents)</p> <p>รายละเอียด: เอกสารต่างๆ ที่มีข้อมูลที่สำคัญในการเรียกร้องสิทธิ</p> <p>อ้างอิง: SLIDE 67</p>

**คำถามเกี่ยวกับความสามารถในการรวบรวม
ข้อมูลที่ใช้เป็นในการจัดการการเรียกร้องสิทธิ (Claim Management)
ส่วนที่ 1/2**

SA.....

คำชี้แจง :

ก. กรุณากรอกรายชื่อเอกสารอย่างน้อย 1 เอกสารในที่ว่างที่เตรียมไว้ให้ ซึ่งตรงกับรายชื่อเอกสารซึ่งเจ้าของงาน วิศวกรที่ปรึกษา ผู้ควบคุมงาน หรือผู้ที่เกี่ยวข้องอื่นๆ ในโครงการสนามบินสุวรรณภูมิ สามารถค้นหาข้อมูลที่ใช้เป็นในการจัดการการ Claim ในคำถามแต่ละข้อ

ข. ในกรณีที่ข้อมูลดังกล่าวไม่สามารถหาได้ในโครงการสนามบินสุวรรณภูมิ กรุณาเลือกตัวเลือก “ไม่สามารถหาได้ (N.A.)”

ค. ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ทราบคำตอบของคำถาม กรุณาเลือกตัวเลือก “ไม่รู้ (N.K.)”

ตัวอย่าง

- a. ข้อมูลดัชนีราคาหุ้น
(Stock Index)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1. ...Website ของตลาด.....	(N.A.)	(N.K.)
...หลักทรัพย์แห่งประเทศไทย.....		
2. ...รายงานข่าวโทรทัศน์.....		
3. ...รายงานข่าววิทยุ.....		

- b. ข้อมูลภาวะตลาดหุ้นในต่างประเทศ
(Situation of Foreign Stock Market)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.A.)	(N.K.)
2.		
3.		

- c. ข้อมูลของคนวงใน
(Insider's Stock Data)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.A.)	(N.K.)
2.		
3.		

กลุ่มที่ 1 : ข้อมูลเกี่ยวกับเจ้าของงาน (Data concerning the employer)

1. ข้อมูลประมาณการกระแสเงินสดของ
เจ้าของงานที่คิดตอนเริ่มโครงการ
(Original Employer's Cash Flow)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.A.)	(N.K.)
2.		
3.		

2. ข้อมูลกระแสเงินสดของเจ้าของงานที่เกิดขึ้นจริงในโครงการ (Actual Employer's Cash Flow)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

3. ข้อมูลสถานะทางการเงินของเจ้าของงาน (Actual Employer's Information)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

4. ข้อมูลค่าใช้จ่ายของเจ้าของงานในงานซึ่งแยกบันทึกในบัญชีที่กำหนดขึ้นโดยเฉพาะ (Employer's Cost in the Segmented Cost Code)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : บัญชีที่กำหนดขึ้น โดยเฉพาะ เป็นบัญชีซึ่งทำขึ้นเพื่อบันทึกค่าใช้จ่ายที่เกิดขึ้นจริงของเจ้าของงานในบางกรณี เช่น ค่าดำเนินการ (Overhead Cost) หรือค่าใช้จ่ายในงานเพิ่มเติมเล็กๆ ซึ่งใช้การจ้างแบบต้นทุนบวกค่าธรรมเนียม (Cost Plus Fee) เป็นต้น

5. ข้อมูลต้นทุนของเงินทุนของเจ้าของงาน (Employer's Cost of Capital)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ต้นทุนของเงินทุน เป็นค่าใช้จ่ายที่เกิดขึ้นในการจัดหาเงินมาลงทุน ได้แก่ ดอกเบี้ยสำหรับเงินที่กู้ยืมมา และผลตอบแทนที่จะต้องจ่ายให้แก่ผู้ถือหุ้นกรณีการออกหุ้นเพื่อนำเงินมาลงทุน

6. ข้อมูลเกี่ยวกับความสามารถหรือประสิทธิภาพของผู้รับเหมาที่เจ้าของงานได้รับนอกจากที่ระบุในเอกสารสัญญา (Statement the Employer Receive)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

7. ข้อมูลรายละเอียดของงานซึ่งเจ้าของงานทำให้แก่ผู้รับเหมา (Works Done by the Employer)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

8. ข้อมูลวันที่เจ้าของงานซื้อวัสดุซึ่งเจ้าของงานเป็นผู้จัดหา (Date of Employer's Free-Issue Material Purchase)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

9. ข้อมูลราคาต่อหน่วยของวัสดุซึ่งเจ้าของงานเป็นผู้จัดหา (Employer's Free-Issue Material Unit Price)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

10. ข้อมูลจำนวนของวัสดุซึ่งเจ้าของเป็นผู้จัดหาที่ส่งให้ผู้รับเหมา (Employer's Free-Issue Material Sent to the Contractor)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

11. ข้อมูลจำนวนของวัสดุซึ่งเจ้าของเป็นผู้จัดหาซึ่งส่งคืนแก่เจ้าของงาน (Employer's Free-Issue Material Return to Employer)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

12. ข้อมูลชั่วโมงการทำงานจริงของเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Actual Hour)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

13. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการใช้งานเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Hourly Operating Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ค่าใช้จ่ายในการใช้งานเครื่องจักร เป็นค่าใช้จ่ายที่เกิดขึ้นในการใช้งานเครื่องจักร ได้แก่ ค่าใช้จ่ายที่เกิดจากค่าบำรุงรักษา ค่าน้ำมัน ค่าน้ำมันเครื่องและสารหล่อลื่นต่างๆ

14. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการครอบครองเครื่องจักรที่เจ้าของงานเป็นผู้จัดหา (Employer's Equipment Hourly Ownership Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ค่าใช้จ่ายในการครอบครองเครื่องจักร ประกอบด้วย ค่าใช้จ่ายที่เกิดจากค่าเสื่อมราคา ค่าเก็บรักษา ค่าดอกเบี้ย ค่าความเสี่ยง ค่าภาษี และค่าประกันภัยเครื่องจักร

15. ข้อมูลอัตราค่าแรงของลูกจ้างของ
เจ้าของงาน
(Employer's Personnel Rate)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
16. ข้อมูลจำนวนชั่วโมงการทำงานของ
ลูกจ้างของเจ้าของงานที่ใช้ในงาน
เพิ่มเติม (Employer's Personnel Hours
Used in Additional Work)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
17. ข้อมูลจำนวนชั่วโมงการทำงานของ
ลูกจ้างของเจ้าของงานซึ่งใช้อัตราค่าแรง
ที่เพิ่มขึ้นจากตอนเริ่มโครงการ
(Employer's Personnel Hours of
Increased Rate)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |

กลุ่มที่ 2 : ข้อมูลเกี่ยวกับผู้รับเหมา (Data concerning the contractor)

18. ข้อมูลรายละเอียดของการ Claim ต่อ
ผู้รับเหมา(ของโครงการปัจจุบัน) ใน
โครงการก่อนๆ (Claims against the
Contractor in the Former Projects)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
19. ข้อมูลความสามารถและประสบการณ์
ของผู้รับเหมา
(Contractor's Information)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
20. ข้อมูลเกี่ยวกับความสามารถและ
ประสบการณ์ของผู้รับเหมาซึ่งเจ้าของ
งานได้รับ (Contractor's Information
the Employer Received)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
21. ข้อมูลต้นทุนของเงินทุนของผู้รับเหมา
(Contractor's Cost of Capital)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |

หมายเหตุ : ต้นทุนของเงินทุน เป็นค่าใช้จ่ายที่เกิดขึ้นในการจัดหาเงินมาลงทุน ได้แก่ ดอกเบี้ยสำหรับเงินที่กู้ยืมมา และผลตอบแทนที่จะต้องจ่ายให้แก่ผู้ถือหุ้นกรณีการออกหุ้นเพื่อนำเงินมาลงทุน

22. ข้อมูลจำนวนของลูกจ้างของผู้รับเหมาที่ทำงานในบริเวณสถานที่ก่อสร้างในแต่ละวัน (Number of Contractor's Personnel at Site)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

23. ข้อมูลมูลค่ารวมของโครงการทั้งหมดที่ผู้รับเหมาได้รับในปัจจุบัน (Total Price of Contracts the Contractor Receive)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

24. ข้อมูลรายละเอียดของงานซึ่งผู้รับเหมาทำ (Works Done by the Contractor)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

25. ข้อมูลเกี่ยวกับรายละเอียดของงานก่อสร้างซึ่งผู้รับเหมาได้รับก่อนเสนอราคา (Works Information the Contractor Received)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

26. ข้อมูลจำนวนของผู้รับเหมาในโครงการ (Number of Contractors in the Project)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ในโครงการที่มีขนาดใหญ่บางโครงการ เจ้าของงานอาจจ้างผู้รับเหมาหลายรายเพื่อทำงานในแต่ละส่วนของโครงการ พร้อมกันหรือต่อเนื่องกันไป

27. ข้อมูลระยะเวลาในการทำงานตามแผนงานของผู้รับเหมาแต่ละราย (Each Contractor's Works Duration)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ในโครงการที่มีขนาดใหญ่บางโครงการ เจ้าของงานอาจจ้างผู้รับเหมาหลายรายเพื่อทำงานในแต่ละส่วนของโครงการ พร้อมกันหรือต่อเนื่องกันไป

28. ข้อมูลความสัมพันธ์ระหว่างงานของผู้รับเหมาแต่ละรายในโครงการ (Each Contractor's Works Relationship)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ในโครงการที่มีขนาดใหญ่บางโครงการ เจ้าของงานอาจจ้างผู้รับเหมาหลายรายเพื่อทำงานในแต่ละส่วนของโครงการ พร้อมกันหรือต่อเนื่องกันไป

29. ข้อมูลวันที่เริ่มต้นงานตามแผนงานของผู้รับเหมาแต่ละรายในโครงการ (Each Contractor's Works Start Date)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ในโครงการที่มีขนาดใหญ่บางโครงการ เจ้าของงานอาจจ้างผู้รับเหมาหลายรายเพื่อทำงานในแต่ละส่วนของโครงการ พร้อมกันหรือต่อเนื่องกันไป

30. ข้อมูลรายละเอียดของงานที่กระทำโดยผู้รับเหมารายอื่น ในกรณีที่มีผู้รับเหมาเดิมที่ทำงาน (Works Done by Other Contractors)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

กลุ่มที่3 : ข้อมูลเกี่ยวกับโครงการก่อสร้าง (Data concerning the project)

31. ข้อมูลเกี่ยวกับรายละเอียดของงานก่อสร้าง (Actual Works Information)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

32. ข้อมูลวันที่เจ้าของงานสามารถใช้งานก่อสร้างได้ (Date that the Work can be Used as Intended)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

33. ข้อมูลผลของการทดสอบงานก่อสร้าง (Test Result)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

34. ข้อมูลผลผลิตภาพโดยทั่วไปในการทำงานก่อสร้าง (Normal Productivity)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ผลผลิตภาพหาได้จากปริมาณงานที่คนงานหรือเครื่องจักรทำได้ในหนึ่งหน่วยเวลา

35. ข้อมูลผลผลิตภาพของการทำงานก่อสร้างในโครงการ (Productivity Records)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ผลผลิตภาพหาได้จากปริมาณงานที่คนงานหรือเครื่องจักรทำได้ในหนึ่งหน่วยเวลา

36. ข้อมูลอัตราผลตอบแทนที่ต้องการของโครงการ (Required Rate of Return of Project)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

37. ข้อมูลราคาต่อหน่วยซึ่งได้ปรับราคาแล้ว (Adjusted Unit Cost of Works)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

38. ข้อมูลค่าเช่าเครื่องจักรโดยทั่วไป (Normal Equipment Rental Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

39. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการใช้งานเครื่องจักรโดยทั่วไป (Normal Hourly Equipment Operating Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ค่าใช้จ่ายในการใช้งานเครื่องจักร เป็นค่าใช้จ่ายที่เกิดขึ้นในการใช้งานเครื่องจักร ได้แก่ ค่าใช้จ่ายที่เกิดจากค่าบำรุงรักษา ค่าน้ำมัน ค่าน้ำมันเครื่องและสารหล่อลื่นต่างๆ

40. ข้อมูลค่าใช้จ่ายต่อชั่วโมงในการครอบครองเครื่องจักรโดยทั่วไป (Normal Hourly Equipment Ownership Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : ค่าใช้จ่ายในการครอบครองเครื่องจักร ประกอบด้วย ค่าใช้จ่ายที่เกิดจากค่าเสื่อมราคา ค่าเก็บรักษา ค่าดอกเบี้ย ค่าความเสี่ยง ค่าภาษี และค่าประกันภัยเครื่องจักร

41. ข้อมูลอัตราค่าแรงโดยทั่วไป (Normal Labor Rate)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

42. ข้อมูลราคาวัสดุต่อหน่วยโดยทั่วไป (Normal Material Unit Price)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

43. ข้อมูลรูปแบบของค่าใช้จ่ายของผู้รับเหมาที่เกิดขึ้นในแต่ละช่วงโครงการสำหรับงานก่อสร้างประเภทต่างๆ (Cost Pattern of the opportunity profit loss Project)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : มีงานวิจัยบางงาน แสดงให้เห็นว่าในงานก่อสร้างประเภทเดียวกัน จะมีรูปแบบการเพิ่มขึ้นของค่าใช้จ่ายซึ่งผู้รับเหมาใช้ในการดำเนินการก่อสร้างเป็นรูปแบบเดียวกัน

44. ข้อมูลอัตราส่วน(ร้อยละ) โดยประมาณของค่าดำเนินการ+กำไร+ภาษี ต่อต้นทุนทางตรง (Percent Overhead+Profit+Tax / Direct Cost)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

45. ข้อมูลรายละเอียดของสาเหตุที่จำเป็นต้องนำเทคนิคการก่อสร้างแบบใหม่มาใช้ (Need of the New Technology)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

46. ข้อมูลข้อดี ข้อเสียและข้อจำกัดของเทคนิคการก่อสร้างที่ใช้เดิม (Advantage, Disadvantage and Limitation of the Original Technology)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

47. ข้อมูลข้อดี ข้อเสีย และข้อจำกัดของ เทคนิคการก่อสร้างใหม่ที่จะนำมาใช้ (Advantage, Disadvantage and Limitation of the New Technology)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

48. ข้อมูลวันที่รับเอกสาร (Date of Documents Received)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

49. ข้อมูลรายละเอียดของเอกสารที่ได้รับ (Details of Documents Received)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

50. ข้อมูลวันที่ส่งเอกสาร (Date of Documents Submitted)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

51. ข้อมูลรายละเอียดของเอกสารที่ส่ง (Details of Documents Submitted)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

“ฉบับแบบสอบถามส่วนที่ 1 ขอกราบขอบพระคุณที่ท่านให้ความอนุเคราะห์ข้อมูล”

**คำถามเกี่ยวกับความสามารถในการรวบรวม
ข้อมูลที่ใช้เป็นในการจัดการการเรียกร้องสิทธิ (Claim Management)
ส่วนที่ 2/2**

SB.....

คำชี้แจง :

ก. กรุณากรอกรายชื่อเอกสารอย่างน้อย 1 เอกสารในที่ว่างที่เตรียมไว้ให้ ซึ่งตรงกับรายชื่อเอกสารซึ่งเจ้าของงาน วิศวกรที่ปรึกษา ผู้ควบคุมงาน หรือผู้ที่เกี่ยวข้องอื่นๆ ในโครงการสนามบินสุวรรณภูมิ สามารถค้นหาข้อมูลที่ใช้เป็นในการจัดการการ Claim ในคำถามแต่ละข้อ

ข. ในกรณีที่ข้อมูลดังกล่าวไม่สามารถหาได้ในโครงการสนามบินสุวรรณภูมิ กรุณาเลือกตัวเลือก “ไม่สามารถหาได้ (N.A.)”

ค. ในกรณีที่คำถามไม่ชัดเจน หรือ ท่านไม่ทราบคำตอบของคำถาม กรุณาเลือกตัวเลือก “ไม่รู้ (N.K.)”

ตัวอย่าง

- a. ข้อมูลดัชนีราคาหุ้น
(Stock Index)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1. ...Website ของตลาด.....	(N.A.)	(N.K.)
...หลักทรัพย์แห่งประเทศไทย.....		
2. ...รายงานข่าวโทรทัศน์.....		
3. ...รายงานข่าววิทยุ.....		

- b. ข้อมูลภาวะตลาดหุ้นในต่างประเทศ
(Situation of Foreign Stock Market)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.A.)	(N.K.)
2.		
3.		

- c. ข้อมูลของคนวงใน
(Insider's Stock Data)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.K.)	(N.K.)
2.		
3.		

กลุ่มที่3 : ข้อมูลเกี่ยวกับโครงการก่อสร้าง (Data concerning the project)

52. ข้อมูลลักษณะสภาพภูมิอากาศที่คาดว่าจะเกิดขึ้น
(Expected Climatic Condition)

หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
1.	(N.A.)	(N.K.)
2.		
3.		

53. ข้อมูลลักษณะสภาพภูมิอากาศที่เกิดขึ้นจริงในโครงการ (Climatic Condition)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
54. ข้อมูลลักษณะสภาพดินที่คาดว่าจะพบ (Expected Soil Condition)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
55. ข้อมูลลักษณะสภาพดินในบริเวณสถานที่ก่อสร้าง (Soil Condition)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
56. ข้อมูลลักษณะสภาพแวดล้อมภายในสถานที่ก่อสร้าง (Site Condition)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
57. ข้อมูลสภาพแวดล้อมภายในบริเวณใกล้เคียงสถานที่ก่อสร้าง (Site Condition of Neighborhood Sites)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
58. ข้อมูลรายละเอียดของสาเหตุของความชำรุดบกพร่องในงานก่อสร้างที่เกิดขึ้น (Cause of Deficiency in Works)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
59. ข้อมูลรายละเอียดของ ความชำรุดบกพร่องในงานก่อสร้าง (Details of Deficiency in Works)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |

- | | | | |
|--|--|--------------------------|------------------|
| 60. ข้อมูลรายละเอียดของปัญหาในการ
ทำงานก่อสร้าง
(Problem to Perform the Works) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 61. ข้อมูลรายละเอียดของปัญหาของเจ้าของ
งานในการใช้งานก่อสร้างภายหลังการ
รับมอบงานก่อสร้าง
(Problem of Use of Works) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 62. ข้อมูลระยะเวลาซึ่งงานก่อสร้างไม่
สามารถใช้งานได้ตามวัตถุประสงค์
ภายหลังการรับมอบงานก่อสร้าง
(Duration the Work can not be Used
as Its Purpose) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 63. ข้อมูลจำนวนวันที่ล่าช้าที่ผู้รับเหมาต้อง
รับผิดชอบ (Delay Duration
Attributable to the Contractor) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 64. ข้อมูลรายละเอียดของสาเหตุของความ
ล่าช้าที่เกิดขึ้น
(Reasons of Delays) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 65. ข้อมูลวันที่เจ้าของงานใช้งานก่อสร้างแต่
ละครั้งก่อนที่จะรับมอบงาน
(Date of Each Use of Works) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 66. ข้อมูลวัตถุประสงค์ในการที่เจ้าของงาน
ใช้การงานก่อสร้างแต่ละครั้งก่อนที่จะ
รับมอบงาน
(Purpose of Each Use of Works) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |

- | | | | |
|--|--|--------------------------|------------------|
| 67. ข้อมูลวันที่เกิดเหตุการณ์พิเศษหรือ
ผิดปกติขึ้นในบริเวณสถานที่ก่อสร้าง
(Date of Special Events Occurred) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 68. ข้อมูลรายละเอียดของเหตุการณ์พิเศษ
หรือผิดปกติที่เกิดขึ้นในบริเวณสถานที่
ก่อสร้าง (Details of Special Events
Occurred) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 69. ข้อมูลวันที่มีบุคคลภายนอกเข้ามาใน
บริเวณสถานที่ก่อสร้าง
(Date of Visiting the Site) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 70. ข้อมูลรายชื่อของบุคคลภายนอกที่เข้ามา
ในสถานที่ก่อสร้าง
(Name of Visitors) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 71. ข้อมูลวัตถุประสงค์ของบุคคลภายนอก
ในการเข้ามาในสถานที่ก่อสร้าง
(Purpose of Each Visiting the Site) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |
| 72. ข้อมูลรายละเอียดของการเปลี่ยนแปลง
วิธีการก่อสร้าง (Details of Change of
Construction Method) | หาได้จากเอกสาร:
1.
2.
3. | ไม่สามารถหาได้
(N.A.) | ไม่รู้
(N.K.) |

หมายเหตุ : ผู้รับเหมาอาจตัดสินใจเปลี่ยนแปลงวิธีการก่อสร้างเนื่องจากหลายสาเหตุ ได้แก่ ข้อจำกัดของทรัพยากร ความ
ต้องการเร่งงาน การที่สัญญาามีระบุเงื่อนไขในการแบ่งประโยชน์ที่ได้จากการเปลี่ยนแปลงงาน เป็นต้น

กลุ่มที่ 4 : ข้อมูลเกี่ยวกับวิศวกรที่ปรึกษาหรือผู้ควบคุมงานก่อสร้าง

(Data concerning the consultants or construction supervisor)

73. ข้อมูลลักษณะการทำงานของผู้ควบคุมงาน (Work-style of the Engineer)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)
74. ข้อมูลรายละเอียดของการ Claim ต่อผู้ควบคุมงาน(ของโครงการปัจจุบัน) ในอดีต (Claims against the Engineer in the Former Projects)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)
75. ข้อมูลเกี่ยวกับความสามารถและประสบการณ์ของผู้ออกแบบ (Designer's Information)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)
76. ข้อมูลวันที่ผู้ควบคุมงานหรือ เจ้าของงานออกคำสั่งแก่ผู้รับเหมา (Date of Instructions Issued)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)
77. ข้อมูลรายละเอียดของคำสั่งจากผู้ควบคุมงานหรือเจ้าของงานถึงผู้รับเหมา (Details of Instruction Issued)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)

กลุ่มที่ 5 : ข้อมูลเกี่ยวกับการจ่ายเงินหรือราคาสัญญา (Data concerning payment of contract price)

78. ข้อมูลประมาณการจำนวนเงินที่ต้องจ่ายให้แก่ผู้รับเหมารายอื่นในการทำงานของผู้รับเหมาเดิมให้เสร็จ ในกรณีที่ผู้รับเหมาเดิมทิ้งงาน (Estimated Payment to Other Contractors)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)
79. ข้อมูลรายละเอียดของวิธีการคิดค่าจ้างในโครงการอื่นๆ (Payment Practice for Similar Works in Other Projects)	หาได้จากเอกสาร: 1. 2. 3.	ไม่สามารถหาได้ (N.A.)	ไม่รู้ (N.K.)

80. ข้อมูลมูลค่างานที่คิดตอนเริ่มโครงการ
(Original Value of Works)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
81. ข้อมูลจำนวนเงินที่เจ้าของงานจ่ายไป
แล้วทั้งหมด
(Payment Amount)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
82. ข้อมูลวันที่เจ้าของงานจ่ายเงิน
(Payment Date)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
83. ข้อมูลวัตถุประสงค์ของเจ้าของงานใน
การจ่ายเงิน
(Payment Purpose)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
84. ข้อมูลรายชื่อของผู้ที่รับเงินจากเจ้าของ
งาน
(Payment to Whom)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
85. ข้อมูลจำนวนเงินที่เจ้าของงานได้รับ
(Received Payment Amount)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |
86. ข้อมูลวันที่เจ้าของงานได้รับเงิน
(Received Payment Date)
- | | | |
|-----------------|----------------|--------|
| หาได้จากเอกสาร: | ไม่สามารถหาได้ | ไม่รู้ |
| 1. | (N.A.) | (N.K.) |
| 2. | | |
| 3. | | |

87. ข้อมูลรายชื่อของผู้ที่จ่ายเงินให้เจ้าของงาน (Received Payment from Whom)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		
88. ข้อมูลวัตถุประสงค์ของการจ่ายเงินให้เจ้าของงาน (Received Payment Purpose)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

กลุ่มที่ 6 : ข้อมูลเกี่ยวกับความสัมพันธ์ระหว่างผู้ที่เกี่ยวข้องกับงานก่อสร้าง

(Data concerning relationships among parties)

89. ข้อมูลความสามารถของผู้ควบคุมงานในการทำงานร่วมกับผู้รับเหมาในอดีต (Relationship between the other Contractors and the Engineer in the Former Projects)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		
90. ข้อมูลความสามารถในการทำงานร่วมกันระหว่างผู้รับเหมา(ของโครงการปัจจุบัน) และผู้ออกแบบ (ของโครงการปัจจุบัน) ในอดีต (Relationship between the Contractor and Designer in the Former Projects)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		
91. ข้อมูลความสามารถในการทำงานร่วมกันระหว่างผู้ออกแบบและผู้รับเหมาของโครงการ (Relationship between Designer and Contractor in the Project)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		
92. ข้อมูลความร่วมมือกันระหว่างเจ้าของงานและบุคคลที่สามอื่นๆ ที่เกี่ยวข้อง (Relationship between Employer and Third Party)	หาได้จากเอกสาร:	ไม่สามารถหาได้	ไม่รู้
	1.	(N.A.)	(N.K.)
	2.		
	3.		

หมายเหตุ : บุคคลที่สาม ได้แก่ บุคคลอื่นๆ นอกเหนือจากเจ้าของงาน ผู้รับเหมา ลูกจ้างของเจ้าของงาน และลูกจ้างของผู้รับเหมา

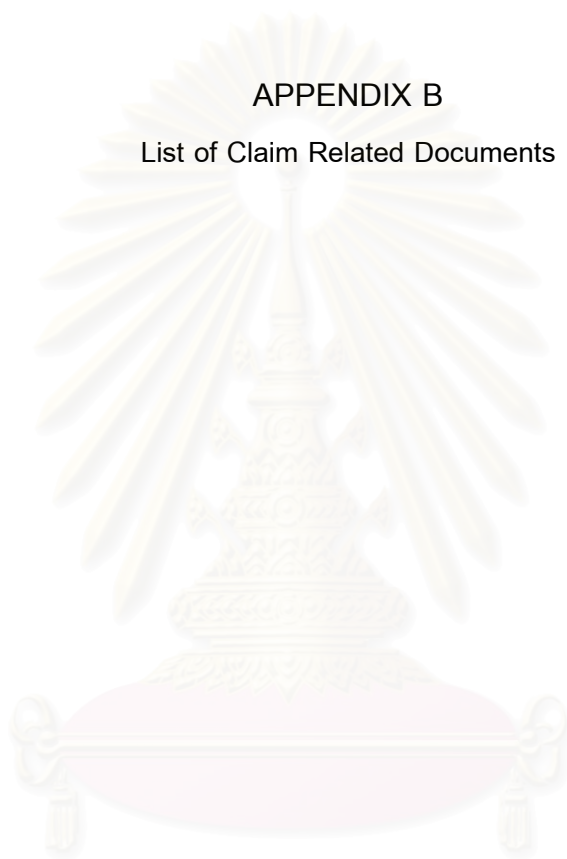
กลุ่มที่ 7 : ข้อมูลอื่นๆ (Other data)

- | | | | |
|---|---|-------------------------------------|-----------------------------|
| <p>93. ข้อมูลราคาทีเสนอประมูล (ในอดีต) ของผู้รับเหมาแต่ละรายที่เข้าร่วมประมูลในโครงการในอดีต (Bid Price of Each Contractor in Past Bidding Project)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>94. ข้อมูลราคาทีเสนอประมูลของผู้รับเหมาแต่ละรายในโครงการปัจจุบัน (Bid Price of Each Contractor)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>95. ข้อมูลรายละเอียดของกฎหมายหรือระเบียบข้อบังคับที่เกี่ยวข้องกับการก่อสร้าง (Law or Regulation)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>96. ข้อมูลวันที่เกิดการเปลี่ยนแปลงกฎหมายหรือระเบียบข้อบังคับ (Date of Law and Regulation Changed)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>97. ข้อมูลรายละเอียดของกฎหมายและระเบียบข้อบังคับที่เปลี่ยนแปลง (Details of Law and Regulation Changed)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>98. ข้อมูลรายละเอียดของมาตรฐานที่ใช้ในการก่อสร้าง (Standard)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |
| <p>99. ข้อมูลรายละเอียดของเอกสารสัญญา (Details of Contract Documents)</p> | <p>หาได้จากเอกสาร:</p> <p>1.</p> <p>2.</p> <p>3.</p> | <p>ไม่สามารถหาได้</p> <p>(N.A.)</p> | <p>ไม่รู้</p> <p>(N.K.)</p> |

<p>100. ข้อมูลรายละเอียดของงานที่ผู้รับเหมา ช่วงทำ (Details of Works Done by the Subcontractor)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>
<p>101. ข้อมูลความเห็นของผู้เชี่ยวชาญด้าน วิศวกรรม (Engineering Expert's Opinion)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>
<p>102. ข้อมูลความเห็นของผู้เชี่ยวชาญด้าน กฎหมาย (Law Expert's Opinion)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>
<p>103. ข้อมูลความเห็นของผู้เชี่ยวชาญด้าน การเงิน (Financial Expert's Opinion)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>
<p>104. ข้อมูลอัตราดอกเบี้ยของธนาคารแห่ง ประเทศไทย (Interest Rate of Central Bank)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>
<p>105. ข้อมูลประมาณการอัตราดอกเบี้ยของ ธนาคารแห่งประเทศไทยในอนาคต (Expected Interest Rate of Central Bank at Profit Loss Project Duration)</p>	<p>หาได้จากเอกสาร: 1. 2. 3.</p>	<p>ไม่สามารถหาได้ (N.A.)</p>	<p>ไม่รู้ (N.K.)</p>

APPENDIX B

List of Claim Related Documents



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
1.	a. Bill of Quantities b. Blank Bill of Quantities	High (10.97)	GC1.1	Employer Contractor	Employer Tenderer (Contractor)	a. Details of Contract Documents b. Percent Overhead + Profit + Tax / Direct Cost c. Original Value of Works d. Bid Price of Each Contractor e. Works Information Contractor Received
2.	Specifications	High (7.44)	GC1.1	Employer	Tenderer (Contractor)	a. Details of Contract Documents b. Works Information Contractor Received c. Expected Soil Condition
3.	Addenda	High (7.40)	GC1.1	Employer	Tenderer (Contractor)	Works Information Contractor Received
4.	Drawings	High (7.40)	GC1.1	Employer	Tenderer (Contractor)	a. Details of Contract Documents b. Works Information Contractor Received
5.	Schedules of Rates	High (7.32)	GC1.1	Tenderer (Contractor)	Employer	Details of Contract Documents
6.	a. Contract Agreement b. Employer/ Consultant Agreement c. Dispute Adjudication Agreement	High (9.20)	GC1.1 GC20.2 CA1 NA	Employer Contractor Engineer Consultant	Contractor NA	a. Details of Contract Documents b. Employer's Personal Rate c. Original Value of Works d. Actual Employer's Information

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
6. (Cont.)				DAB-Member Supplier		e. Bid Price of Each Contractor f. Number of Contractors in Project
7.	a. General Conditions b. General Conditions of Dispute Adjudication Agreement c. General Conditions of Employer/ Consultant Agreement	High (7.40)	GC1.1 GC20.2 CA1 NA	Employer Contractor DAB- Member Supplier	Tenderer (Contractor) Engineer Consultant NA	a. Details of Contract Documents b. Works Information Contractor Received
8.	a. Letter of Acceptance b. Letter of Acceptance to Consultant	High (7.35)	GC1.1 CA1	Employer	Contractor Engineer Consultant	a. Details of Contract Documents b. Number of Contractors in Project
9.	a. Particular Conditions of Contract b. Particular Conditions of Employer/ Consultant Agreement	High (7.44)	GC1.1 CA1 NA	Employer Supplier	Tenderer (Contractor) Engineer Consultant NA	a. Details of Contract Documents b. Works Information Contractor Received c. Expected Soil Condition
10.	a. Letter of Tender b. Schedule for Completion by Tenderer c. Proposal from Consultant	High (8.65)	GC1.1 CA21 NA	Tenderer (Contractor) Engineer Consultant All	Employer	a. Details of Contract Documents b. Original Value of Works c. Contractor's Information d. Contractor's Information Employer Received

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
10. (Cont.)	d. Proposal from Supplier e. Proposal from Insurer f. Proposal from Surety					e. Bid Price of Each Contractor f. Statement Employer Received g. Designer's Information
11.	Instruction for Solving Ambiguity or Discrepancy in Documents	High (12.36)	GC1.5	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
12.	a. Agreement to Assign b. Agreement of DAB Member Assignment or Subcontract c. Notice of Consent to Assign Benefits from Agreement	High (7.32)	GC1.7 DA2 CA38	Employer Contractor DAB-Member Engineer Consultant	NA	Details of Contract Documents
13.	a. Publication b. Cost Index c. Selling Exchange Rate	High (27.53)	GC1.8 GC13.8 CA42	Other Engineer Consultant	Contractor Engineer Other	a. Normal Productivity b. Normal Equipment Rental Cost c. Normal Hourly Equipment Operating Cost d. Normal Hourly Equipment Ownership Cost e. Normal Labor Rate f. Normal Material Unit Price g. Cost Pattern of Opportunity Profit Loss Project

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
13. (Cont.)						h. Bid Price of Each Contractor in Past Bidding Project i. Expected Interest Rate of Central Bank at Profit Loss Project Duration j. Employer's Free-Issue Material Unit Price k. Law Expert's Opinion l. Expected Climatic Condition m. Payment Practice for Similar Works or Projects n. Site Condition of Neighborhood Sites o. Contractor's Information Employer Received p. Date of Law and Regulation Changed q. Details of Law and Regulation Changed r. Claims against Contractor in Former Projects s. Claims against Engineer in Former Projects t. Advantage, Disadvantage and Limitation of Original Technology

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
13. (Cont.)						u. Advantage, Disadvantage and Limitation of New Technology v. Relationship between Other Contractors and Engineer in Former Projects w. Designer's Information x. Standard y. Work-style of Engineer z. Relationship between Contractor and Designer in Former Projects
14.	a. Notice of Claim Notification b. Notice of Monthly Claim Details c. Notice of Final Claim Details d. Notice of Claim for Intellectual and Industrial Property Right e. Notice of Delay Caused by Employer or Contractor	High (32.15)	GC2.5 GC17.5 GC20.1 CA18 CA29 CA25 D1	Employer Engineer Contractor Consultant Supplier or Third Party Surety Insurer	Employer Engineer Contractor Consultant Supplier Third Party	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Reasons of Delays e. Payment Date f. Delay Duration Attributable to Contractor g. Climatic Condition

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
14. (Cont.)						h. Received Payment Amount i. Received Payment from Whom j. Received Payment Purpose k. Received Payment Date l. Duration Work can not be Used as Its Purpose m. Work-style of Engineer
15.	Notice of Determination of Claim	High (30.92)	GC2.5 GC20.1	Engineer Consultant Employer	Employer Contractor Engineer Consultant	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Reasons of Delays e. Payment Date f. Delay Duration Attributable to Contractor
16.	Agreement of Engineer's Additional Constraint	High (7.32)	GC3.1	Employer Contractor	NA	Details of Contract Documents
17.	a. Notice of Confirmation b. Variation of Instruction of the Engineer's Assistant	High (12.36)	GC3.2	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
18.	a. Instruction or Approval by Engineer's Assistant b. Notice of Decision by Court's Member	High (12.36)	GC3.2 IC1.4	Engineer's Assistant Court's Member	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
19.	Notice of Confirmation of Engineer's Oral Instruction	High (7.30)	GC3.3	Contractor	Engineer	a. Details of Instruction Issued b. Date of Instructions Issued
20.	a. Instruction b. Modified Drawings c. Instruction from Employer to Consultant	High (12.36)	GC3.3 CA11	Engineer Employer	Contractor Engineer Consultant	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
21.	Instruction to Assign Benefit of Subcontractor	High (7.30)	GC4.5	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
22.	Progress Report	High (25.43)	GC4.21	Contractor	Engineer	a. Reasons of Delays b. Delay Duration Attributable to Contractor c. Site Condition d. Works Done by Contractor e. Productivity Records f. Details of Works Done by Subcontractor

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
22. (Cont.)						g. Employer's Free-Issue Material Sent to Contractor h. Employer's Free-Issue Material Return to Employer i. Employer's Equipment Actual Hour j. Climatic Condition k. Actual Works Information l. Date of Special Events Occur m. Details of Special Events Occur n. Number of Contractor's Personnel at Site o. Works Done by Other Contractors p. Details of Change in Construction Method q. Soil Condition r. Work-style of Engineer s. Problem to Perform Works

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
23.	Instruction to Deal with Fossils	High (12.36)	GC4.24	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
24.	Notice of Fossils	High (9.43)	GC4.24	Contractor	Engineer	a. Reasons of Delays b. Site Condition c. Actual Works Information
25.	Instruction to Employ Nominated Subcontractor	High (7.30)	GC5.1	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
26.	Agreement to Indemnify the Contractor against Nominated Subcontractor's Performance	High (7.32)	GC5.2	Employer Contractor	NA	Details of Contract Documents
27.	Request to Pay Nominated Subcontractor	High (7.30)	GC5.4	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
28.	a. Report of Accident b. Report of Accident Details	High (9.62)	GC6.7	Contractor	Engineer	a. Reasons of Delays b. Delay Duration Attributable to Contractor c. Problem to Perform Works

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
29.	Request for Accident Report	High (7.30)	GC6.7	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
30.	a. Instruction to Remove Contractor's Personnel b. Request for Change in Consultant's or Employer's Personnel c. Notice to Challenge of Arbitrator	High (7.30)	GC6.9 CA15 IC2.8	Engineer Consultant Employer Contractor	Contractor Employer Engineer Consultant Secretary of Court of Arbitration	a. Details of Instruction Issued b. Date of Instructions Issued
31.	a. Instruction of Form of Contractor's Personnel and Equipment Record b. Notice of Approved Form of Award	High (7.30)	GC6.10 IC21	Engineer Court of Arbitration	Contractor Arbitration	a. Details of Instruction Issued b. Date of Instructions Issued
32.	Instruction to Submit Additional Sample	High (12.36)	GC7.2	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
33.	Instruction to Uncover and Reinstate	High (12.36)	GC7.3	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
34.	a. Instruction to Vary Time and Place b. Instruction to Perform Additional Test	High (12.36)	GC7.4	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
35.	Agreement of Testing Time and Place	High (7.32)	GC7.4	Engineer Contractor	NA	Details of Contract Documents
36.	a. Instruction to Retest b. Instruction to Remove c. Instruction to Remove and Re-execute d. Instruction to Execute Urgent Work in Case of Failure to Pass the Test e. Request for Repeated Test on Completion	High (16.91)	GC7.5 GC7.6 GC9.3 GC11.6	Engineer Contractor	Contractor Engineer	a. Details of Instruction Issued b. Reasons of Delays c. Delay Duration Attributable to Contractor d. Date of Instructions Issued
37.	Request for Estimated Effect of Adverse Future Circumstance	High (7.30)	GC8.3	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
38.	Instruction to Revise Programme	High (7.31)	GC8.6	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
38. (Cont.)						c. Problem to Perform Works
39.	Instruction to Suspend	High (12.37)	GC8.8	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued d. Problem to Perform Works
40.	Instruction to Mark the Plant or Material as the Employer's Property	High (7.30)	GC8.10	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
41.	Instruction to Resume	High (11.84)	GC8.12	Engineer	Contractor	a. Details of Instruction Issued b. Delay Duration Attributable to Contractor c. Date of Instructions Issued
42.	Instruction to Perform Test on Completion	High (7.30)	GC9.2	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
43.	a. Agreement or Notice of Determination of Deducted Contract Price Due to Failure to Pass Test on Completion	High (21.31)	GC9.4 GC11.4	Employer Contractor Engineer	NA Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
43. (Cont.)	b. Agreement or Notice of Determination of Deducted Contract Price Due to Failure to Remedy Defect					
44.	Notice of Determination of Cost of Contractor's Search	High (21.31)	GC11.8	Engineer	Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date
45.	Instruction for Contractor's Search	High (12.37)	GC11.8	Engineer	Contractor	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued d. Problem to Perform Works e. Problem of Use of Works
46.	Record of Works to be Measured	High (24.85)	GC12.1	Engineer	NA	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Works Done by Contractor

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
46. (Cont.)						f. Employer's Free-Issue Material Sent to Contractor g. Works Done by Other Contractors
47.	a. Notice of Determination of Contract Price b. Agreement of Adjustment of Contract Price c. Notice of Determination of Cost of Plant and Material Intended for the Works d. Notice of Determination of Valuation at Date of Termination e. Agreement of Member's Fee Adjustment	High (21.31)	GC12.3 GC13.4 GC14.5 GC15.2 DA6	Engineer Contractor	Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date
48.	a. Proposal for Variation b. Notice of Application for Variation in Client/ Consultant Agreement	High (7.36)	GC13.1 CA23 CA24	Contractor Employer Engineer Consultant	Engineer Consultant Employer	a. Details of Instruction Issued b. Date of Instructions Issued c. Need of New Technology

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
48. (Cont.)	c. Request for Proposal for Altering the Consultant's Service					
49.	a. Request for Variation Proposal b. Request for Proposal for Altering the Consultant's Service	High (12.36)	GC13.1 CA24	Engineer Consultant Employer	Contractor Engineer Consultant	a. Details of Instruction Issued b. Reasons of Delays c. Date of Instructions Issued
50.	Instruction to Use of Provisional Sum	High (7.30)	GC13.5	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
51.	a. Invoice from Contractor b. Invoice from Supplier c. Invoice from Engineer or Consultant d. Invoice of DAB Member's Expense	High (25.24)	GC13.5 DA6 NA	Contractor Member Supplier Engineer Consultant Surety Insurer	Engineer Employer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Employer's Free-Issue Material Unit Price f. Date of Employer's Free-Issue Material Purchase g. Employer's Personal Rate

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
51. (Cont.)						h. Employer's Personnel Hours Used in Additional Work i. Employer's Personnel Hours of Increased Rate
52.	a. Receipt from Contractor b. Receipt from Supplier c. Receipt from Engineer or Consultant d. Receipt of DAB Member's Expense	High (22.09)	GC13.5 DA6 NA	Contractor Member Supplier Engineer Consultant Surety Insurer	Engineer Employer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Date of Employer's Free-Issue Material Purchase
53.	a. Request for Quotation b. Request for Invoice c. Request for Voucher d. Request for Receipt	High (7.30)	GC13.5 NA	Engineer	Contractor Supplier Insurer Surety	a. Details of Instruction Issued b. Date of Instructions Issued
54.	Instruction to Use Daywork Basis	High (7.30)	GC13.6	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
55.	a. Statement of Resources Used for Daywork Payment b. Statement of Price of Resources Used for Daywork Payment c. Statement for Application of Interim Payment Certificate d. Statement of the Cost of Acquiring and Delivering the Plant and Material to the Site	High (21.31)	GC13.6 GC14.3 GC14.5 CA27	Contractor Engineer Consultant	Engineer Employer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date
56.	a. Interim Payment Certificate b. Final Payment Certificate c. Certificate of First Installment of Advance Payment d. Certificate of Payment of Retention Money e. Payment Certificate in Case of Optional Termination	High (30.16)	GC14.2 GC14.6 GC14.11 GC14.9 GC19.6	Engineer Consultant	Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Works Done by Contractor f. Productivity Records g. Details of Works Done by Subcontractor h. Received Payment Amount i. Received Payment from Whom

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
56. (Cont.)						j. Received Payment Purpose k. Received Payment Date l. Works Done by Other Contractors
57.	a. Notice of Determination of Schedule of Payment b. Notice of Contractor's Quarterly Estimation	High (21.31)	GC14.4	Engineer Contractor	Employer Contractor Engineer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date
58.	a. Final Statement b. Drafted Final Statement c. Statement at Completion	High (35.55)	GC14.10 GC14.11	Contractor	Engineer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Total Price of Contracts Contractor Receive f. Works Done by Contractor g. Productivity Records h. Adjusted Unit Cost of Works i. Details of Works Done by Subcontractor j. Received Payment Amount k. Received Payment from Whom

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
58. (Cont.)						l. Received Payment Purpose m. Received Payment Date n. Works Done by Other Contractors
59.	Instruction to Apply for Final Payment Certificate	High (7.30)	GC14.13	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
60.	Instruction to Protect Life or Property in Case of Termination by Employer	High (7.30)	GC15.2	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
61.	Request for Contractor's Claim Details	High (7.30)	GC20.1	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
62.	Instruction to Keep Further Record of Contractor's Claim	High (7.30)	GC20.1	Engineer	Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
63.	a. Notice of DAB Decision or Opinion b. Notice of Arbitrator's Award c. Notice of Determination by Arbitrator d. Report of Decision of Minority of DAB e. Notice of Employer's Decision	High (31.62)	GC20.4 GC20.6 PR9 CA8 CA43 CA44	Member Employer Mediator Arbitrator Court	Employer Contractor Engineer Consultant Court All	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Reasons of Delays e. Payment Date f. Delay Duration Attributable to Contractor

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
63. (Cont.)	f. Notice of Recommendation or Non-binding Opinion by Mediator g. Record of Fact Agreed in Mediation h. Notice of Chairman of Court of Arbitration's Urgent Decision i. Notice of Award by Consent j. Drafted Award k. Notice of Court's Decision		IC1.3 IC13.2 IC17 IC21 NA			g. Received Payment Amount h. Received Payment from Whom i. Received Payment Purpose j. Received Payment Date
64.	a. Notice of Dispute Information to DAB, Designated Representative, Mediator, Arbitrator b. Request for Decision or Opinion from DAB, Designated Representative, Mediator, Arbitrator c. Request for Arbitration d. Notice to Make Counter-claim	High (34.38)	GC20.4 CA8 CA43 IC3.1 IC3.3 IC4.1 IC5.1 IC5.2 NA	Employer Contractor Engineer Consultant Secretary of Court of Arbitration All	Employer Contractor DAB Member Designated Representative Mediator Secretary of Court of Arbitration	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Details of Instruction Issued e. Reasons of Delays f. Payment Date g. Date of Instructions Issued h. Received Payment Amount i. Received Payment from Whom j. Received Payment Purpose

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
64. (Cont.)	e. Notice of Answer of Request for Arbitration f. Notice to Reply Counter-claim				National Committee All Court	k. Received Payment Date l. Problem to Perform Works
65.	a. Instruction of Arbitrator b. Notice to Call for Witness by Arbitrator	High (7.30)	GC20.6	Arbitrator	Employer Engineer Contractor	a. Details of Instruction Issued b. Date of Instructions Issued
66.	Application for Reimbursement of Payment to DAB Member	High (22.88)	DA6	Contractor	Employer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Employer's Personal Rate f. Employer's Personnel Hours of Increased Rate
67.	Request for DAB's Site Visit	High (7.30)	PR1	Employer Contractor	Member	a. Details of Instruction Issued b. Date of Instructions Issued

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
68.	a. Instructions to Tenderers b. Request for Proposal	High (7.37)	TD NA	Employer	Tenderer (Contractor) Engineer Consultant	a. Details of Instruction Issued b. Date of Instructions Issued c. Works Information Contractor Received
69.	Agreement of Additional Service	High (7.32)	CA4	Employer Engineer Consultant	NA	Details of Contract Documents
70.	Request for Insurance Covers from Consultant	High (7.30)	CA19	Employer	Engineer Consultant	a. Details of Instruction Issued b. Date of Instructions Issued
71.	a. Notice of Cost of Mediation b. Instruction to Pay Mediation Preparing Cost	High (30.18)	CA43	Mediator	Employer Engineer Consultant	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Details of Instruction Issued e. Payment Date f. Date of Instructions Issued g. Employer's Personal Rate h. Employer's Personnel Hours of Increased Rate

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
72.	Agreement of Dispute between Employer and Consultant	High (22.01)	CA43	Employer Engineer Consultant	NA	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Received Payment Amount f. Received Payment from Whom g. Received Payment Purpose h. Received Payment Date
73.	Notice of Advance to Cover Costs of Arbitration	High (21.31)	IC9.1	Court	Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date
74.	Agreement of Participation of Persons Not Involved in Arbitration	High (7.32)	IC15.4	Employer Contractor Arbitration	NA	Details of Contract Documents
75.	Notice of Decision as to Costs of Arbitration	High (21.31)	IC20.1	Arbitrator	Employer Contractor	a. Payment Amount b. Payment Purpose c. Payment to Whom

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
75. (Cont.)						d. Payment Date
76.	a. Consultant's Monthly Report b. Consultant's Weekly Report c. Consultant's Daily Report	High (56.96)	NA	Engineer Consultant	Employer	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Details of Instruction Issued e. Reasons of Delays f. Payment Date g. Delay Duration Attributable to Contractor h. Site Condition i. Works Done by Contractor j. Productivity Records k. Details of Works Done by Subcontractor l. Date of Instructions Issued m. Details of Deficiency in Works n. Employer's Free-Issue Material Sent to Contractor

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
76. (Cont.)						o. Employer's Free-Issue Material Return to Employer p. Employer's Equipment Actual Hour q. Employer's Personnel Hours Used in Additional Work r. Works Done by Employer s. Climatic Condition t. Cause of Deficiency in Works u. Actual Works Information v. Relationship between Employer and Third Party w. Date of Special Events Occur x. Details of Special Events Occur y. Number of Contractor's Personnel at Site z. Works Done by Other Contractors aa. Duration Work can not be Used as Its Purpose ab. Details of Change in Construction Method ac. Soil Condition

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
76. (Cont.)						ad. Date of Each Use of Works ae. Purpose of Each Use of Works af. Date of Visiting Site ag. Name of Visitors ah. Purpose of Each Visiting Site ai. Work-style of Engineer aj. Problem to Perform Works
77.	Minutes of Meetings	High (47.23)	NA	Engineer Consultant	Employer Contractor Engineer Consultant	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Details of Instruction Issued e. Payment Date f. Delay Duration Attributable to Contractor g. Works Done by Contractor h. Productivity Records i. Details of Works Done by Subcontractor j. Date of Instructions Issued k. Details of Deficiency in Works

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
77. (Cont.)						l. Employer's Free-Issue Material Sent to Contractor m. Employer's Free-Issue Material Return to Employer n. Employer's Equipment Actual Hour o. Employer's Personnel Hours Used in Additional Work p. Works Done by Employer q. Cause of Deficiency in Works r. Actual Works Information s. Relationship between Employer and Third Party t. Date of Special Events Occur u. Details of Special Events Occur v. Site Condition of Neighborhood Sites w. Works Done by Other Contractors x. Duration Work can not be Used as Its Purpose y. Details of Change in Construction Method

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
77. (Cont.)						z. Soil Condition aa. Date of Each Use of Works ab. Purpose of Each Use of Works ac. Work-style of Engineer ad. Relationship between Designer and Contractor in Project ae. Problem to Perform Works af. Problem of Use of Works
78.	a. Notice of Expert's Opinion b. Report from Expert	High (34.99)	NA	Expert	Employer Engineer Consultant Arbitrator	a. Law or Regulation b. Delay Duration Attributable to Contractor c. Site Condition d. Normal Productivity e. Normal Equipment Rental Cost f. Normal Hourly Equipment Operating Cost g. Normal Hourly Equipment Ownership Cost h. Normal Labor Rate i. Normal Material Unit Price j. Cost Pattern of Opportunity Profit Loss Project

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
78. (Cont.)						k. Expected Interest Rate of Central Bank at Profit Loss Project Duration l. Engineering Expert's Opinion m. Employer's Free-Issue Material Unit Price n. Law Expert's Opinion o. Expected Climatic Condition p. Payment Practice for Similar Works or Projects q. Cause of Deficiency in Works r. Site Condition of Neighborhood Sites s. Date of Law and Regulation Changed t. Details of Law and Regulation Changed u. Advantage, Disadvantage and Limitation of New Technology v. Expected Soil Condition w. Financial Expert's Opinion
79.	Site Diary	High (31.06)	NA	Engineer Consultant	Employer	a. Details of Instruction Issued b. Reasons of Delays

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
79. (Cont.)						c. Site Condition d. Works Done by Contractor e. Productivity Records f. Details of Works Done by Subcontractor g. Date of Instructions Issued h. Details of Deficiency in Works i. Employer's Free-Issue Material Sent to Contractor j. Employer's Free-Issue Material Return to Employer k. Employer's Equipment Actual Hour l. Employer's Personnel Hours Used in Additional Work m. Works Done by Employer n. Climatic Condition o. Cause of Deficiency in Works p. Actual Works Information q. Relationship between Employer and Third Party

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
79. (Cont.)						r. Date of Special Events Occur s. Details of Special Events Occur t. Number of Contractor's Personnel at Site u. Works Done by Other Contractors v. Details of Change in Construction Method w. Soil Condition x. Date of Each Use of Works y. Purpose of Each Use of Works z. Date of Visiting Site aa. Name of Visitors ab. Purpose of Each Visiting Site ac. Work-style of Engineer ad. Problem to Perform Works
80.	a. Record of Employer's Financial Transaction b. Financial Report	High (30.94)	NA	Employer	NA	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Total Price of Contracts Contractor Receive

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
80. (Cont.)						f. Employer's Cost in Segmented Cost Code g. Employer's Free-Issue Material Unit Price h. Employer's Cost of Capital i. Received Payment Amount j. Received Payment from Whom k. Received Payment Purpose l. Actual Employer's Information m. Received Payment Date
81.	Record of Equipment Cost from Employer	High (24.43)	NA	Employer	NA	a. Payment Amount b. Payment Purpose c. Payment to Whom d. Payment Date e. Employer's Equipment Hourly Ownership Cost f. Actual Employer's Information
82.	Contractor's Daily Report	High (12.35)	NA	Contractor	Engineer Consultant	a. Reasons of Delays b. Works Done by Contractor

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
82. (Cont.)						c. Details of Works Done by Subcontractor d. Employer's Equipment Actual Hour e. Climatic Condition f. Date of Special Events Occur g. Details of Special Events Occur h. Number of Contractor's Personnel at Site i. Works Done by Other Contractors j. Details of Change in Construction Method k. Soil Condition l. Date of Visiting Site m. Name of Visitors n. Purpose of Each Visiting Site o. Problem to Perform Works p. Problem of Use of Works
83.	Contractor's Weekly Report	High (11.56)	NA	Contractor	Engineer Consultant	a. Reasons of Delays b. Works Done by Contractor c. Details of Works Done by Subcontractor d. Climatic Condition

Table B-1 High Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
83. (Cont.)						e. Date of Special Events Occur f. Details of Special Events Occur g. Number of Contractor's Personnel at Site h. Works Done by Other Contractors i. Details of Change in Construction Method j. Soil Condition k. Date of Visiting Site l. Name of Visitors m. Purpose of Each Visiting Site n. Problem to Perform Works o. Problem of Use of Works

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
1.	Notice to Clarification	Medium (5.14)	GC1.3	Engineer	Contractor	a. Reasons of Delays b. Works Information Contractor Received
2.	Notice of Address	Medium (0.19)	GC1.3	Employer Engineer Contractor	Employer Engineer Contractor	Actual Employer's Information
3.	a. Laws or Regulations b. Practice or Standard or Safety Regulation c. ICC's Rules of Arbitration d. Municipal Procedural Law	Medium (6.49)	GC1.4 GC4.8 GC20.6 IC11 IC13.3	Other	All	a. Law or Regulation b. Interest Rate of Central Bank c. Normal Labor Rate d. Payment Practice for Similar Works or Projects e. Standard
4.	Notice of Required Drawings or Instruction	Medium (5.08)	GC1.9	Contractor	Engineer	a. Reasons of Delays b. Problem to Perform Works
5.	a. Notice of Contractor's Information b. Notice of Employer's Information to Consultant	Medium (0.59)	GC1.12 GC12.1 GC14.11 CA7	Contractor Employer	Engineer Consultant	a. Contractor's Information b. Actual Employer's Information c. Contractor's Information Employer Received d. Statement Employer Received
6.	Evidence of Employer's Financial Arrangement	Medium (0.19)	GC2.4	Employer	Contractor	Actual Employer's Information

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
7.	Notice to Change Financial Status	Medium (0.19)	GC2.4	Employer	Contractor	Actual Employer's Information
8.	Notice to Reply of Contractor's Confirmation	Medium (5.07)	GC3.3	Engineer	Contractor	Reasons of Delays
9.	a. Notice to Object Engineer Replacement b. Notice of Consent or Revocation of Consent to Contractor's Representative Delegation, Replacement, or Revocation c. Notice of Consent or Revocation of Consent to Delegation or Revocation by Contractor's Representative d. Notice of Objection to Nominated Subcontractor	Medium (0.03)	GC3.4 GC4.3 GC5.2	Engineer Contractor	Engineer Contractor	Work-style of the Engineer

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
10.	Notice of Engineer's Determination	Medium (5.10)	GC3.5	Engineer	Contractor	a. Reasons of Delays b. Work-style of Engineer
11.	a. As-built Document b. Manual	Medium (5.64)	GC4.1	Contractor	Engineer	a. Works Done by Contractor b. Productivity Records c. Actual Works Information d. Works Done by Other Contractors
12.	a. Notice of Proposed Construction Method b. Notice of Change in Construction Method	Medium (5.24)	GC4.1	Contractor	Engineer	a. Reasons of Delays b. Need of New Technology c. Advantage, Disadvantage and Limitation of Original Technology d. Details of Change in Construction Method
13.	a. Contractor's Documents b. Employer's Documents c. Consultant's Documents	Medium (0.19)	GC4.1 CA9 CA39	Contractor Employer Engineer Consultant	Engineer Contractor Employer	Actual Employer's Information
14.	Notice of Point, Line, and Level of References	Medium (4.25)	GC4.7	Engineer	Contractor	a. Site Condition b. Works Information Contractor Received

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
15.	Notice of Site Data	Medium (4.74)	GC4.10	Employer	Tenderer (Contractor)	a. Site Condition b. Expected Climatic Condition c. Works Information Contractor Received d. Expected Soil Condition
16.	Evidence of Foreseeable Physical Condition	Medium (4.37)	GC4.12	Contractor	Engineer	a. Site Condition b. Actual Works Information
17.	a. Notice of Unforeseeable Physical Condition b. Notice of Changed Circumstance	Medium (5.31)	GC4.12 CA26	Contractor Engineer Consultant	Engineer Employer	a. Reasons of Delays b. Actual Works Information c. Soil Condition d. Problem to Perform Works
18.	Agreement for Solving Employer's Equipment or Free-Issue Material Shortage	Medium (5.08)	GC4.20	Employer Contractor	NA	a. Reasons of Delays b. Problem to Perform Works
19.	a. Notice of Material Approval b. Notice of Material Rejection	Medium (5.07)	GC7.2	Engineer	Contractor	Reasons of Delays
20.	a. Certificate of Test b. Notice of Rejection	Medium (5.26)	GC7.4 GC7.5	Engineer	Contractor	a. Reasons of Delays b. Cause of Deficiency in Works

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
21.	a. Report of Test b. Report of Test on Completion	Medium (0.53)	GC7.4 GC9.1	Contractor	Engineer	Test Result
22.	a. Programme b. Revised Programme	Medium (0.90)	GC8.3	Contractor	Engineer	a. Estimated Payment to Other Contractors b. Need of New Technology c. Each Contractor's Works Duration d. Each Contractor's Works Start Date
23.	Notice of Adverse Future Circumstance	Medium (0.01)	GC8.3	Contractor	Engineer	Problem to Perform Works
24.	Notice of Inconsistent Programme	Medium (0.01)	GC8.3	Engineer	Contractor	Problem to Perform Works
25.	Notice of Readiness for Performing Test on Completion	Medium (0.43)	GC9.1	Contractor	Engineer	Date that Work can be Used as Intended
26.	Notice of Test on Completion Date	Medium (5.07)	GC9.1 GC9.2	Engineer Contractor	Engineer Contractor	Reasons of Delays
27.	a. Taking-over Certificate for Works b. Taking-over Certificate for Section	Medium (0.43)	GC10.1	Engineer	Contractor	Date that Work can be Used as Intended

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
27. (Cont.)	c. Notice to Reject Taking-Over Certificate Application					
28.	Notice of Cause of Defect Not Attributable to Contractor	Medium (5.27)	GC11.2	Employer	Contractor	a. Reasons of Delays b. Cause of Deficiency in Works c. Problem to Perform Works
29.	a. Employer's Security Restriction b. Regulation of Court of Arbitration	Medium (5.26)	GC11.7 IC1.2	Employer Court of Arbitration	NA	a. Reasons of Delays b. Actual Employer's Information
30.	a. Notice of Provisional Unit Rate b. Notice of Provisional Cost Index	Medium (2.70)	GC12.3 GC13.8	Engineer	Employer Contractor NA	Adjusted Unit Cost of Works
31.	Notice of Disability to Comply Variation Order	Medium (5.08)	GC13.1	Contractor	Engineer	a. Reasons of Delays b. Problem to Perform Works
32.	a. Variation Order b. Notice to Cancel, Confirm, or Vary Variation c. Approval of Variation Proposal d. Notice of Agreement of Variation in Client/ Consultant Agreement	Medium (5.07)	GC13.1 GC13.2 CA23 CA24	Engineer Consultant Employer	Contractor Employer Engineer Consultant	Reasons of Delays

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
32. (Cont.)	e. Proposal for Altering the Consultant's Service					
33.	a. Quotation from Contractor b. Quotation from Supplier c. Quotation from Engineer or Consultant d. Quotation of DAB Member's Expense	Medium (0.79)	GC13.5 DA6 NA	Contractor DAB Member Supplier Engineer Consultant Surety Insurer	Engineer Employer	Employer's Free-Issue Material Unit Price
34.	Change in Law	Medium (5.28)	GC13.7	Other	All	a. Reasons of Delays b. Date of Law and Regulation Changed c. Details of Law and Regulation Changed d. Need of New Technology
35.	a. Notice to Correct b. Notice to Correct from Employer to Consultant	Medium (6.12)	GC15.1 CA27	Engineer Employer	Contractor Engineer Consultant	a. Reasons of Delays b. Details of Deficiency in Works c. Cause of Deficiency in Works d. Problem to Perform Works

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
36.	Notice to Terminate	Medium (0.01)	GC15.2 GC16.2 DA7 CA27 NA	Employer Contractor DAB Member Engineer Consultant Insurer Surety	Employer Contractor DAB Member Engineer Consultant Insurer Surety	Problem to Perform Works
37.	Notice of Suspension	Medium (0.01)	GC16.1 CA27	Contractor Engineer Consultant	Employer	Problem to Perform Works
38.	Notice of the Employer's Risks	Medium (5.08)	GC17.4	Contractor	Engineer	a. Reasons of Delays b. Problem to Perform Works
39.	a. Notice of Force Majeure b. Notice of Ceasing of Force Majeure c. Notice of Event Entitling Party Right to Release from Performance under the Law	Medium (5.08)	GC19.2 GC19.3 GC19.7	Employer Contractor	Employer Contractor	a. Reasons of Delays b. Problem to Perform Works

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
40.	Agreement of Timing and Agenda for Each Site Visit by DAB	Medium (7.32)	PR2	Employer Contractor Member	NA	Details of Contract Documents
41.	Report of Site Visit by DAB	Medium (4.17)	PR3	Member	Employer Contractor	Site Condition
42.	Agreement of Additional Service	High (7.32)	CA4	Employer Engineer Consultant	NA	Details of Contract Documents
43.	Agreement of Method of Payment to Consultant	Medium (0.79)	CA30	Employer Engineer Consultant	NA	Employer's Personal Rate
44.	Tender Documents of Other Tenderers	Medium (6.27)	NA	Other Tenderer	Employer	a. Percent Overhead + Profit +Tax / Direct Cost b. Bid Price of Each Contractor in Past Bidding Project c. Estimated Payment to Other Contractors d. Bid Price of Each Contractor

จุฬาลงกรณ์มหาวิทยาลัย

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
45.	Tender Documents in Past Bidding Project	Medium (5.39)	NA	Contractor Other Contractor	Employer	a. Percent Overhead + Profit +Tax / Direct Cost b. Bid Price of Each Contractor in Past Bidding Project
46.	Employer's Financial Plan	Medium (3.71)	NA	Employer	NA	a. Original Employer's Cash Flow b. Estimated Payment to Other Contractors
47.	Daily Employer's Equipment Time Report	Medium (3.68)	NA	Employer	NA	a. Productivity Records b. Employer's Equipment Actual Hour c. Actual Employer's Information
48.	Notice of Contractor's Cost of Capital	Medium (3.45)	NA	Tenderer (Contractor)	Employer	a. Contractor's Cost of Capital b. Contractor's Information
49.	Feasibility Report	Medium (2.92)	NA	Engineer Consultant	Employer	a. Original Employer's Cash Flow b. Required Rate of Return of Project
50.	Project's Master Schedule	Medium (2.43)	NA	Engineer Consultant	Employer	a. Each Contractor's Works Duration b. Each Contractor's Works Relationship c. Each Contractor's Works Start Date'

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
51.	a. Delivery Order b. Delivery Order of Employer's Equipment c. Delivery Order of Free-Issue Material d. Delivery Order of Employer's Equipment e. Delivery Order of Free-Issue Material Returned to Employer	Medium (2.14)	NA	Supplier	Employer	a. Employer's Free-Issue Material Sent to Contractor b. Employer's Free-Issue Material Return to Employer c. Works Done by Employer
52.	Employer's Personnel Hour Report	Medium (1.57)	NA	Employer	NA	a. Employer's Personnel Hours Used in Additional Work b. Employer's Personnel Hours of Increased Rate
53.	Purchase Order	Medium (1.57)	NA	Employer	Supplier	a. Employer's Free-Issue Material Unit Price b. Date of Employer's Free-Issue Material Purchase
54.	a. Notice to Claim against Security b. Notice to Claim against Insurance Cover	Medium (1.55)	NA	Employer	Surety Insurer	a. Details of Deficiency in Works b. Received Payment Amount c. Received Payment from Whom

Table B-2 Medium Importance Documents (with Claim Data Other than Details/ Date of Documents) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
54. (Cont.)						d. Received Payment Purpose e. Received Payment Date
55.	Employer's Equipment Utilization Report	Medium (0.98)	NA	Employer	NA	a. Employer's Equipment Actual Hour b. Actual Employer's Information
56.	Employer's Personnel Report	Medium (0.79)	NA	Employer	NA	Employer's Personal Rate
57.	Contractor's Daily Request	Medium (0.44)	NA	Contractor	Engineer Consultant	Expected Climatic Condition
58.	Employer's Equipment Identification Card	Medium (0.19)	NA	Employer	NA	Actual Employer's Information
59.	Report of Site Visitor	Medium (0.13)	NA	Contractor	Engineer	a. Date of Visiting Site b. Name of Visitors c. Purpose of Each Visiting Site
60.	Notice for Use of Works by Employer	Medium (0.10)	NA	Employer Engineer Consultant	Contractor	a. Date of Each Use of Works b. Purpose of Each Use of Works

Table B-3 Low Importance Documents (without Claim Data)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
1.	Appendix to Tender	Low (0.00)	GC1.1	Employer	Tenderer (Contractor)	N.A.
2.	Daywork Schedule	Low (0.00)	GC1.1	Contractor	Employer	N.A.
3.	Letter of Assignment	Low (0.00)	GC1.7	Employer Contractor	Employer Contractor	N.A.
4.	Notice of Consent to Communicate Contractor's Document to Third Party	Low (0.00)	GC1.10	Contractor	Employer	N.A.
5.	Notice of Consent to Communicate Employer's Document to Third Party	Low (0.00)	GC1.11	Employer	Engineer	N.A.
6.	a. Request for the Contractor's Information b. Request for Particulars for Work Measurement or Assistants c. Request for Information Related to Final Statement	Low (0.00)	GC1.12 GC12.1 14.11	Engineer	Contractor	N.A.

Table B-3 Low Importance Documents (without Claim Data (Cont.))

No.	Name	Document Importance Index	Reference	From	To	Claim Data
7.	Permission or License	Low (0.00)	GC1.13	Other	Engineer Contractor	N.A.
8.	Notice of the Joint Venture's Leader	Low (0.00)	GC1.14	Contractor	Employer	N.A.
9.	Notice of Consent to Change Joint Venture's Position	Low (0.00)	GC1.14	Employer	Contractor	N.A.
10.	a. Request for the Employer's Assistance b. Request for Assisting in Contesting the Claim	Low (0.00)	GC2.2 GC17.5	Contractor Employer	Employer Contractor	N.A.
11.	Notice of Approval of Exercising Engineer's Specified Authority	Low (0.00)	GC3.1	Employer	Engineer	N.A.
12.	Inquiry of Instruction of the Engineer's Assistant	Low (0.00)	GC3.2	Contractor	Engineer	N.A.
13.	a. Notice of Assignment, Delegation, or Revocation of Engineer's Duty and Authority to Assistant or of	Low (0.00)	GC3.2 GC4.3 GC20.2	Engineer Contractor Engineer	Contractor Engineer Consultant	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
13. (Cont.)	Contractor's Representative b. Notice to Nominate DAB Member c. Notice of Appointment of Designated Representative or Mediator d. Notice of Appointment or Confirmation of Arbitrator or Chairman of Arbitral Tribunal		CA43 IC1.4 IC2.1 IC2.3 IC2.4 IC14.2 NA	Consultant Court All	Employer Arbitrator All	
14.	e. Notice to Delegate Court's Power f. Notice to Appointing Expert					
15.	a. Notice of Engineer Replacement b. Notice of Delegation, Replacement or Revocation of Contractor's Representative c. Notice of Replacement of DAB Member d. Notice of Arbitrator Replacement	Low (0.00)	GC3.4 GC4.3 GC20.2 IC2.13	Employer Contractor Court	Contractor Engineer Arbitrator	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
16.	a. Performance Security b. Security for Removal of Defective Work c. Increased Performance Security d. Advance Payment Security e. Security of Payment to DAB Member f. Tender Security g. Bank Guarantee for Plant and Material Intended for the Works	Low (0.00)	GC4.2 GC11.5 GC14.2 GC14.5 DA5 TD	Contractor Tenderer Surety	Employer Member	N.A.
17.	Notice of Commencement of Subcontractor's Work or Subcontractor's Work at Site	Low (0.00)	GC4.4	Contractor	Engineer	N.A.
18.	a. Notice of Consent to Proposed Subcontractor b. Notice of Consent to Initiate or Terminate Consultant's Subcontract	Low (0.00)	GC4.4 CA38	Engineer Employer	Contractor Engineer Consultant	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
19.	a. Notice of Proposed Subcontractor b. Request to Initiate or Terminate Consultant's Subcontract	Low (0.00)	GC4.4 CA38	Contractor Engineer Consultant	Engineer Employer	N.A.
20.	Notice of Assigning Benefit of Subcontractor	Low (0.00)	GC4.5	Contractor	Employer	N.A.
21.	Notice of Quantity Assurance System Details	Low (0.00)	GC4.9	Contractor	Engineer	N.A.
22.	Notice of Plant or Goods Delivery Date	Low (0.00)	GC4.16	Contractor	Engineer	N.A.
23.	Notice of Consent to Remove Contractor's Equipment from Site	Low (0.00)	GC4.17	Engineer	Contractor	N.A.
24.	Notice of Determination of Amount of Employer's Equipment and Free-Issue Material Required	Low (0.00)	GC4.20	Engineer	Employer Contractor	N.A.
25.	Evidence of Payment to Nominated Subcontractor	Low (0.00)	GC5.4	Contractor	Engineer	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
26.	Notice of Right to Withhold Payment to Nominated Subcontractor	Low (0.00)	GC5.4	Contractor	Engineer	N.A.
27.	Notice of Consent to Work on Holiday	Low (0.00)	GC6.5	Engineer	Contractor	N.A.
28.	Request for Working on Holiday	Low (0.00)	GC6.5	Contractor	Engineer	N.A.
29.	Record of Contractor's Personnel and Equipment	Low (0.00)	GC6.10	Contractor	Engineer	N.A.
30.	Request for Sample Approval and Material Information	Low (0.00)	GC7.2	Contractor	Engineer	N.A.
31.	Notice of Covering up	Low (0.00)	GC7.3	Contractor	Engineer	N.A.
32.	Notice of Intention to Attend or Not Attend Test or Examination of Covering up	Low (0.00)	GC7.3 GC7.4	Engineer	Contractor	N.A.
33.	Notice of Testing Information or Document	Low (0.00)	GC7.4	Contractor	Engineer	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
34.	a. Notice to Proceed b. Notice of Taking Effect of Dispute Adjudication Agreement	Low (0.00)	GC8.1 DA2	Engineer Employer Contractor	Contractor Member	N.A.
35.	Request for Resumption	Low (0.00)	GC8.11	Contractor	Engineer	N.A.
36.	Application for Taking-over Certificate	Low (0.00)	GC10.1	Contractor	Engineer	N.A.
37.	a. Notice of Date to Remedy Defect b. Agreement of Period to Begin or to Meet with Mediator or to Begin Arbitration	Low (0.00)	GC11.4 CA43	Engineer Consultant Employer	Contractor NA	N.A.
38.	Notice of Consent to Remove Defective Work	Low (0.00)	GC11.5	Employer	Contractor	N.A.
39.	Performance Certificate	Low (0.00)	GC11.9	Engineer	Contractor	N.A.
40.	a. Notice of Disagreement of Measurement	Low (0.00)	GC12.1 GC20.4	Employer Contractor	Employer Contractor	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
40. (Cont.)	b. Notice of Dissatisfaction				Engineer	
41.	Notice of Omission	Low (0.00)	GC12.4	Contractor	Engineer	N.A.
42.	Notice of Determination of Reduced Contract Value from Variation	Low (0.00)	GC13.2	Engineer	Employer Contractor	N.A.
43.	Notice of Determination of Source of Cost Index	Low (0.00)	GC13.8	Engineer	Employer Contractor	N.A.
44.	Proposed Breakdown of Lump Sum Price	Low (0.00)	GC14.1	Contractor	Engineer	N.A.
45.	Notice of Approval of Surety Form	Low (0.00)	GC14.2	Employer	Contractor	N.A.
46.	a. Bill of Lading b. Evidence of Payment of Freight or Shipment of Plant and Material Intended for the Works	Low (0.00)	GC14.5	Contractor	Engineer	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
47.	a. Insurance Cover for Plant and Material Intended for the Works b. Insurance Cover from Consultant	Low (0.00)	GC14.5 CA19	Contractor Insurer	Engineer	N.A.
48.	Notice of Change in Drafted Final Statement	Low (0.00)	GC14.11	Engineer	Contractor	N.A.
49.	Discharge	Low (0.00)	GC14.12	Contractor	Engineer	N.A.
50.	Notice of Release of Contractor's Equipment and Temporary Works	Low (0.00)	GC15.2	Employer	Contractor	N.A.
51.	Evidence of Insurance Application	Low (0.00)	GC18.1	Employer Contractor Insurer	Employer Contractor	N.A.
52.	a. Notice of Approval of Insurance Policy b. Notice of Approval of Change in Insurance Policy c. Agreement of Insurance Term	Low (0.00)	GC18.1	Employer Contractor	Contractor NA	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
53.	Notice of Insurance Policy Alternation by Insuring Party or Insurer	Low (0.00)	GC18.1	Employer Contractor Insurer	Employer Contractor	N.A.
54.	Notice of Unavailable Insurance Cover	Low (0.00)	GC18.2	Contractor	Employer	N.A.
55.	Approval of the Interval Time to Submit Contractor's Claim	Low (0.00)	GC20.1	Engineer	Contractor	N.A.
56.	Notice of Interval Time to Submit Claim	Low (0.00)	GC20.1	Contractor	Engineer	N.A.
57.	a. Notice of Resignation from DAB Member b. Notice of Resignation from Arbitrator	Low (0.00)	GC20.2 DA7 IC2.10	Member	Employer Contractor	N.A.
58.	Notice of Application to Nominated Organization for DAB Member or Mediator	Low (0.00)	GC20.3 CA43	Employer Contractor Member	Nominated Organization	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
59.	a. Notice of Representation of DAB Member's Impartiality and Independence b. Notice of Fact Inconsistent with DAB Member's Impartiality and Independence c. Notice to Disclose Facts or Circumstances Inconsistent with Arbitrator's Independence	Low (0.00)	DA3 IC2.7	Member Arbitrator Secretary of Court of Arbitration	Employer Contractor Secretary of Court of Arbitration	N.A.
60.	a. Agreement of DAB Power and Method b. Programme for Negotiation c. Agreement of ICC Rule of Arbitration d. Agreement of Rules Settled by Parties e. Agreement of Place of Arbitration f. Agreement of Give the Power of an Amicable Compositeur	Low (0.00)	PR7 CA43 IC8.1 IC11 IC13.4 IC14.4	Employer Contractor Engineer Consultant Mediator Court	NA Employer Contractor	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
60. (Cont.)	g. Agreement to Decide on Documents Alone					
61.	Parent Company Guarantee	Low (0.00)	TD	Tenderer (Contractor)	Employer	N.A.
62.	a. Terms of Reference b. Expert's Terms of Reference	Low (0.00)	TD IC13.1 IC14.2	Arbitrator Expert Tenderer (Contractor)	Employer Contractor	N.A.
63.	a. Conditions of Scope of Consultant Services b. Conditions of Personnel, Equipment, Facilities and Services of Others to be Provided by the Employer c. Conditions of Remuneration and Payment	Low (0.00)	CA1	Employer	Engineer Consultant	N.A.
64.	Notice to Contest Consultant's Invoice	Low (0.00)	CA34	Employer	Engineer Consultant	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
65.	Notice to Audit	Low (0.00)	CA35	Employer	Engineer Consultant	N.A.
66.	Notice of Approval of Publication	Low (0.00)	CA42	Employer	Engineer Consultant	N.A.
67.	Notice of Consent to Use Mediator's Non-binding Opinion	Low (0.00)	CA43	Employer Engineer Consultant	Employer Engineer Consultant	N.A.
68.	Agreement of Number of Arbitrator	Low (0.00)	IC2.3	Employer Contractor	NA	N.A.
69.	Notice of Time for Object Arbitrator Nomination	Low (0.00)	IC2.6	Court	Employer Contractor	N.A.
70.	Notice of Acceptance of Arbitrator's Challenge or Resignation	Low (0.00)	IC2.10	Court	Employer Contractor Arbitrator	N.A.
71.	Notice of Arbitrator to be Prevented from Fulfilling Obligation	Low (0.00)	IC2.11	Secretary of Court of Arbitration	Employer Contractor Arbitrator	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
72.	Notice of Comment on Arbitrator to be Prevented from Fulfilling Obligation	Low (0.00)	IC2.11	Employer Contractor Arbitrator	Secretary of Court of Arbitration	N.A.
73.	Notice of Disability to Proceed Arbitration	Low (0.00)	IC7.1	Court	Employer Contractor	N.A.
74.	Notice of Existence or Validity of Arbitration Agreement	Low (0.00)	IC8.3	Court	Employer Contractor	N.A.
75.	Notice to Apply for Interim or Conservatory Measure	Low (0.00)	IC8.5	Employer Contractor	Judicial Authority	N.A.
76.	a. Notice of Application for Extension of Time to Answer b. Notice of Request for Extension of Time to Sign Terms of Reference	Low (0.00)	IC4.1 IC13.2	Employer Contractor Arbitrator	Secretary of Court of Arbitration Court	N.A.
77.	Notice to Hear the Parties Together	Low (0.00)	IC14.1	Court	Employer Contractor	N.A.
78.	Request to Appear before Arbitrator	Low (0.00)	IC15.1	Arbitrator	Employer Contractor	N.A.

Table B-3 Low Importance Documents (without Claim Data) (Cont.)

No.	Name	Document Importance Index	Reference	From	To	Claim Data
79.	Request for Additional Copies of Award	Low (0.00)	IC23.1	Employer Contractor	Secretary	N.A.
80.	a. Application for Security or Insurance Cover b. Notice of Application for Extension of Security or Insurance Cover	Low (0.00)	NA	Employer Engineer Consultant Contractor Surety Supplier Insurer	Surety	N.A.
81.	Received Document Log	Low (0.00)	NA	Employer	NA	N.A.
82.	Request for Expert's Opinion	Low (0.00)	NA	Employer Engineer Consultant	Expert	N.A.
83.	Submitted Document Log	Low (0.00)	NA	Employer	NA	N.A.

CURRICULUM VITAE

Mr.Kongkoon Tochaiwat was born in 1977. He graduated from Assumption College (High School) in 1993 and Chulalongkorn University (B.Eng, M.Eng, and Ph.D) in 1997, 2001, and 2005, respectively. He used to work as a project engineer at Rice Engineering Supply Co., Ltd. during 1998-2001.

When he was a graduate student, he had an outstanding profile and several research works in the fields of construction contract management and construction claim management (some of them are listed in the References). He was a representative of graduate students of Faculty of Engineering and the first champion in the “English Proficiency and Engineering Contract Contest: Council of Engineers Member”, held by the Council of Engineers in 2005. Furthermore, he received the “Outstanding Student Reward” from Thai Buddhist Association on 16 May 2006.

More details and files of his research works are available at his website:
<http://drkongkoon.tripod.com>.



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย