

THE CAUSES OF PROJECT DELAY IN THE MINISTRY OF  
DEFENCE, MALAYSIA

SHAHRIKAL BIN AZHAR

A project report submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Project Management

School of Civil Engineering  
Faculty of Engineering  
Universiti Teknologi Malaysia

DECEMBER 2019

## **DEDICATION**

*Dedicated to my mother. Thank you for the love and tears.*

## ACKNOWLEDGEMENT

All praises to Allah Almighty by His infinite grace has magnified my heart to explore the knowledge of Ar-Rasyiid. May peace and blessing be upon Prophet Muhammad SAW, his parent, family, companions and Ummah.

Mother's prayer, Hjh. Raniah and support of beloved wife, Nurhafiza, has led to little success in pursuing the knowledge of Al-'Adzhiim, as well as my family. My highest appreciation to Dr. Zulhasni Abdul Rahim, my supervisor, for all the time he allocated and all his guidance, encouragement, critics, and generosity to provide his experience and knowledge. This gratitude is also addressed to my lecturers and teachers since I was small until now as without guidance, education and knowledge from them, it is impossible to achieve what has been produced in this book.

I would like to express my appreciation the staff of the Faculty of Engineering, the staff of the International Business School and all the staff of the University of Technology Malaysia. Also, I would like to express my appreciation to the respondents, especially my colleagues who gave their time to answer this research questionnaire and involved in the process of obtaining information or collecting data.

Finally, an endless appreciation to my comrades of the Master of Project Management program intake Semester 2 Session 2017/2018, thanks for sharing the loughs and tears.

## **ABSTRACT**

Time overrun to complete a project is known as delay. The delay in project implementation is often referred to the third phase of project life cycle, carrying out the work. However, there are also delays during the implementation phase as a result of the earlier stages of the process, namely the initiating or planning stages. Projects at the Ministry of Defence, Malaysia (MOD) are also no exception to the situation. The Auditor General of Malaysia has reported in series of reports that MOD projects often experience delays in project implementation. Projects implemented by MOD are aimed at ensuring that the national defence system can protect the sovereignty and territorial integrity of the country. Infrastructure development programs for the MOD are very critical as it involves construction projects for military including Malaysian Armed Forces (MAF), Malaysian Army (MA), Royal Malaysian Navy (RMN), Royal Malaysian Air force (RMAF). Based on previous study, there are ten top factors contributing to the delays in project implementation in the Klang Valley. It was also found that there were problems with the issue of repeated project implementation in public construction project in Malaysia. The causes of delays are specifically are contributed by client / owner, contractor and consultant. This study was conducted using literature reviews, questionnaires and interviews, and the data were analysed using quantitative and qualitative methods to achieve the objectives of the study namely to identify the causes of delays, to analyse the major causes of project delays and to suggest preventive measures to reduce delays. After analysing the data, it was found that the contractor was a major contributor to project delays in MOD. Specialist respondents also provided suggestions on ways to prevent delays.

## **ABSTRAK**

Pelangkauan masa untuk menyiapkan projek dikenali sebagai kelewatan. Kelewatan dalam pelaksanaan projek sering dirujuk kepada fasa ketiga di dalam kitaran hayat projek, iaitu fasa pelaksanaan kerja. Walau bagaimanapun, terdapat juga kelewatan yang berlaku semasa fasa peraksanaan disebabkan oleh kepincangan di peringkat awal proses, iaitu fasa permulaan atau fasa perancangan. Projek-projek di Kementerian Pertahanan Malaysia (KPM) juga tidak terkecuali daripada menghadapi situasi ini. Ketua Audit Negara Malaysia telah melaporkan dalam siri-siri laporan bahawa projek KPM sering mengalami kelewatan dalam pelaksanaan projek. Projek-projek yang dilaksanakan oleh KPM adalah bertujuan untuk memastikan sistem pertahanan negara dapat melindungi kedaulatan dan integriti wilayah. Program pembangunan infrastruktur untuk KPM sangat kritikal kerana ia melibatkan projek pembinaan fasiliti tentera termasuk Angkatan Tentera Malaysia (ATM), Tentera Darat Malaysia (TDM), Tentera Laut Diraja Malaysia (TLDM), Tentera Udara Diraja Malaysia (TUDM). Berdasarkan kajian-kajian yang pernah dilaksanakan, terdapat sepuluh faktor utama yang menyumbang kepada kelewatan pelaksanaan projek di Lembah Klang. Ia juga mendapati terdapat masalah dengan isu pelaksanaan projek berulang dalam projek pembinaan awam di Malaysia. Secara spesifiknya, kelewatan pelaksanaan disumbangkan oleh pelanggan / pemilik, kontraktor dan perunding. Kajian ini dijalankan berdasarkan kajian literatur, soal selidik dan temubual, dan data dianalisis menggunakan kaedah kuantitatif dan kualitatif untuk mencapai matlamat kajian iaitu untuk mengenal pasti sebab-sebab penangguhan, menganalisis penyebab utama kelewatan projek dan mencadangkan langkah pencegahan untuk mengurangkan kelewatan. Selepas menganalisis data, didapati bahawa kontraktor merupakan penyumbang utama untuk menangguhkan kelewatan dalam MOD. Responden pakar juga memberi cadangan mengenai cara untuk mengelakkan kelewatan.

## TABLE OF CONTENTS

|                  | <b>TITLE</b>                                   | <b>PAGE</b> |
|------------------|--|-------------|
|                  | <b>DECLARATION</b>                             | <b>iii</b>  |
|                  | <b>DEDICATION</b>                              | <b>iv</b>   |
|                  | <b>ACKNOWLEDGEMENT</b>                         | <b>v</b>    |
|                  | <b>ABSTRACT</b>                                | <b>vi</b>   |
|                  | <b>ABSTRAK</b>                                 | <b>vii</b>  |
|                  | <b>TABLE OF CONTENTS</b>                       | <b>viii</b> |
|                  | <b>LIST OF TABLES</b>                          | <b>xi</b>   |
|                  | <b>LIST OF FIGURES</b>                         | <b>xii</b>  |
|                  | <b>LIST OF ABBREVIATIONS</b>                   | <b>xiii</b> |
|                  | <b>LIST OF SYMBOLS</b>                         | <b>xv</b>   |
|                  | <b>LIST OF APPENDICES</b>                      | <b>xvi</b>  |
| <b>CHAPTER 1</b> | <b>INTRODUCTION</b>                            | <b>1</b>    |
|                  | 1.1 Background                                 | 1           |
|                  | 1.2 Problem Statement                          | 9           |
|                  | 1.3 Aim  | 12          |
|                  | 1.4 Objective                                  | 13          |
|                  | 1.5 Scope of Study                             | 13          |
| <b>CHAPTER 2</b> | <b>LITERATURE REVIEW</b>                       | <b>15</b>   |
|                  | 2.1 Project Delay in Construction              | 15          |
|                  | 2.2 Project Delay in Public Sector in Malaysia | 25          |

|                  |  |           |
|------------------|--|-----------|
| <b>CHAPTER 3</b> | <b>METHODOLOGY</b>                                   | <b>37</b> |
| 3.1              | Research Design                                      | 37        |
| 3.2              | Population and Sample                                | 39        |
| 3.3              | Data Collection                                      | 40        |
| 3.4              | Data Analysis  | 41        |
| <b>CHAPTER 4</b> | <b>DATA ANALYSIS AND DISCUSSION</b>                  | <b>45</b> |
| 4.1              | Identification of Project Delay Factors              | 46        |
| 4.2              | Major Causes of Delay                                | 50        |
| 4.3              | Preventive Measure for the Delays                    | 69        |
| 4.3.1            | Respondent Background                                | 70        |
| 4.3.2            | Financial Difficulties                               | 71        |
| 4.3.3            | Shortage of Labour                                   | 73        |
| 4.3.4            | Ineffective Planning and Scheduling                  | 74        |
| 4.3.5            | Changes of Order by Client                           | 75        |
| 4.3.6            | Late in Approving the Changes of Work                | 76        |
| 4.3.7            | Late in Providing Services of Utilities              | 77        |
| <b>CHAPTER 5</b> | <b>CONCLUSION AND RECOMMENDATION</b>                 | <b>79</b> |
| 5.1              | Impact to MOD  | 79        |
| 5.1.1            | Impact to the Asset Readiness and Military Personnel | 79        |
| 5.1.2            | Impact on Public's Perceptions and Economy           | 80        |
| 5.1.3            | Impact on Project Cost                               | 81        |

|       |                                    |           |
|-------|------------------------------------|-----------|
| 5.1.4 | Outline of the Research Objectives | 83        |
| 5.2   | Future Studies                     | 84        |
|       | <b>REFERENCES</b>                  | <b>87</b> |
|       | <b>APPENDIX</b>                    | <b>91</b> |



## LIST OF TABLES

| <b>TABLE NO.</b> | <b>TITLE</b>  | <b>PAGE</b> |
|------------------|---|-------------|
| Table 1. 1       | Malaysian Budget 2010-2019  | 7           |
| Table 2. 1       | List of Delay Causes by Different Authors                         | 19          |
| Table 2. 2       | Classification of Causes of Delays                                | 23          |
| Table 2. 3       | Causes of Delay Ranking   | 24          |
| Table 2. 4       | Top Ten Delay Factors in Klang Valley                             | 24          |
| Table 2. 5       | Problems Classification According to Phases<br>in Construction    | 28          |
| Table 2. 6       | Ranking of Delay Factors from Different<br>Categories             | 33          |
| Table 2. 7       | Top Ten Causes of Delays of Government<br>Projectin Kedah         | 34          |
| Table 2. 8       | Causes of Delays According to Respondents<br>Category Perspective | 35          |
| Table 4. 1       | Factors of Delays   | 46          |
| Table 4. 2       | Unique Causes of Delays Related to MOD                            | 48          |
| Table 4. 3       | The Ranking of Causes of Project Delays in<br>MOD                 | 53          |
| Table 4. 4       | Causes of Delays Based on Different Parties<br>Perspectives       | 62          |
| Table 4. 5       | Results of One-way ANOVA  | 63          |
| Table 4. 6       | Results of Post Hoc   | 65          |
| Table 5. 1       | Excusable and Compensable Causes of Delay<br>in MOD               | 82          |

## LIST OF FIGURES

| <b>FIGURE NO.</b> | <b>TITLE</b>  | <b>PAGE</b> |
|-------------------|---|-------------|
| Figure 1. 1       | Typical Project Life Cycle  | 1           |
| Figure 1. 2       | Type of Delay   | 5           |
| Figure 1. 3       | Organization of Project Implementation in<br>MOD                              | 6           |
| Figure 2. 1       | Typical Project Organization Chart  | 16          |
| Figure 2. 2       | Open Conversation System  | 21          |
| Figure 2. 3       | Construction Delay Category   | 22          |
| Figure 2. 4       | Respondents Understandings Regarding Causes<br>of Delay and Their Root Causes | 27          |
| Figure 3. 1       | Research Design   | 38          |
| Figure 4. 1       | Classification of Samples by Category   | 50          |
| Figure 4. 2       | Respondents' Demographic by Total Experience                                  | 51          |
| Figure 4. 3       | Respondents' Demographic by Job Designation                                   | 51          |

## **LIST OF ABBREVIATIONS**

|       |   |  |
|-------|---|--|
| PMBOK | - | Project Management Book of Knowledge     |
| MOD   | - | Ministry of Defence, Malaysia            |
| MAF   | - | Malaysian Armed Forces                   |
| MA    | - | Malaysian Army                           |
| RMN   | - | Royal Malaysian Navy                     |
| RMAF  | - | Royal Malaysian Airforce                 |
| DDES  | - | Division of Defence Engineering Services |
| PWD   | - | Public Work Department                   |
| EOT   | - | Extension of time                        |
| PD    | - | Project Director                         |
| LAD   | - | Liquidated Ascertained Damages           |
| STC   | - | Service Technical Centre                 |
| OSA   | - | Official Secret Act                      |
| MOF   | - | Ministry of Finance, Malaysia            |
| SO    | - | Superintendent Officer                   |
| DB    | - | Design and Build                         |
| OCS   | - | Open Conversion System                   |
| ANOVA | - | Analysis of Variance                     |
| NCR   | - | Native Customary Right                   |
| LSD   | - | Least Significant Difference             |
| QS    | - | Quantity Surveyor                        |
| PM    | - | Project Manager                          |
| P&S   | - | Planning and Scheduling                  |
| TQ    | - | Technical Query                          |

RE - Resident Engineer

## LIST OF SYMBOLS

|          |   |                   |
|----------|---|-------------------|
| $f$      | - | Frequency         |
| MS       | - | Mean Score        |
| N        | - | Total respondents |
| $s$      | - | Score given       |
| $\Sigma$ | - | Sigma             |

## LIST OF APPENDICES

| APPENDIX   | TITLE         | PAGE |
|------------|---------------|------|
| Appendix A | Questionnaire | 87   |

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Project Management Book of Knowledge (PMBOK) sixth edition which has been published in 2017 divided the typical project life cycle into four phases namely starting the project, organizing and preparing, carrying out the work and closing the project. Figure 1.1 shows typical project life cycle according to PMBOK.



Figure 1. 1 Typical Project Life Cycle

Phase 1 is where the end users will register their interest to the top management to have a new facility or project based on their needs. The top management will then be called the project owner or the client, will conduct a feasibility study on whether the project is a 'must have' or 'nice to have'. Special budget will be provided to fund the project if it is approved by the top management. Once the top management has agreed, the process is to appoint consultants to assist the project owner in managing the project in terms of preparation of specifications, design drawings, dealings with the authorities and costing. These processes will take place in the second phase. The procurement process for appointing contractors is also done in this phase. The physical work of the project is carried out in the third phase where the responsibilities are mostly on the shoulders of contractor under the supervision of the consultants. Once the physical work and dealings with the authorities have been completed, the contractor will be awarded a certificate of completion. However, the responsibility is still pending as they have to go through the defect liability period in the last phase. The contractor will have to make repairs in the event of any damages as provided in the contract. Once the contractor and project owner meet their contractual obligations, the project can be considered for completion.

Projects mean a set of related activities to each other to achieve a single objective or product within a set time frame involving the associated costs. While project management is the process of applying knowledge, skills, tools and techniques to activities to complete a project. Project managers and other



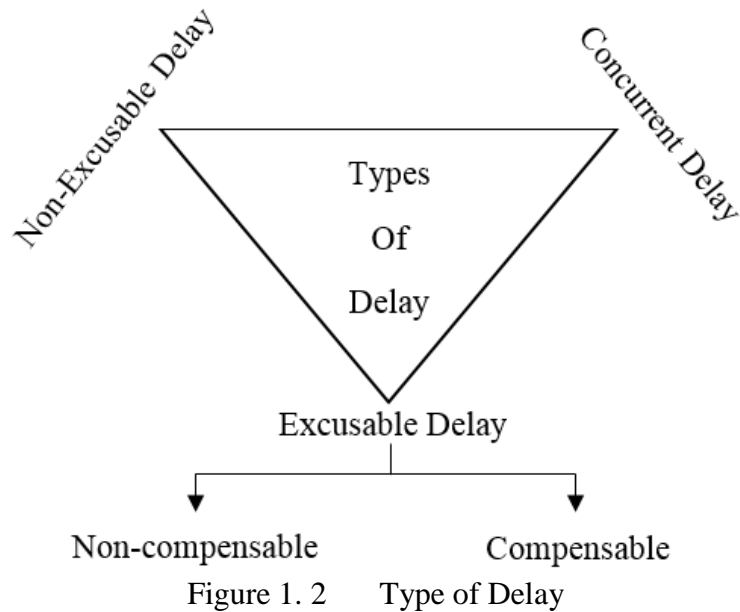
individuals involved in project implementation should have high knowledge and skills in their respective fields. However, there are skills that are not less important than technical skills such as interpersonal, communication, political, leadership, job delegation, cash-flow management, creative decision-making and stakeholder management. Failure of individuals involved in project management to have these characters may lead to delays in executing a project.

The delay in project implementation is often referred to the third phase of project life cycle, carrying out the work. Usually, a delay in a project will occur during the implementation phase. However, there are also delays during the implementation phase as a result of the earlier stages of the process, namely the initiating or planning stages. Delay is defined as time overrun or extension of time to complete the project (N. Hamzah et al., 2011). In situations where any one or more activities within a project are implemented beyond the prescribed time, this situation is considered a delay in the implementation of the project.

Delays can be grouped in the following four broad categories according to how they operate contractually: non-excusable delay; excusable non-compensable delay; excusable compensable delay; and concurrent delay (Alaghbari et al., 2007). Non-excusable delay is delay caused by contractor or its suppliers and without fault by project owner. The contractor is generally not qualified for an extension of time. They should either compensate for lost time through recovery plan or pay compensation to the project owner.

Therefore, non-excusable delays usually incur no additional cost and no additional time being granted to the contractor.

Excusable delays are delays that are not actually caused by the contractor, have reasonable grounds and are proved by the contractor that the delay was not caused by the contractor. Non-compensable excusable delay is a delay that only gives the contractor an extension of time. The contractor is not entitled to claim any compensation from the project owner due to the delay. Such a situation usually occurs when delays are caused by unforeseen occurrence by either the project owner or his / her agents or contractors. These are natural disasters, riots and wars. While compensable excusable delays are situations where delays occur due to project owners or their agents such as delays in site delivery, pending land ownership issues once the site is possessed by contractor and delays in deciding on new areas that need to be implemented during project implementation. The contractor is entitled to apply for an extension of time as well as the loss and expense claim for the duration of the delay. Concurrent delay is a rare event where delays are caused by both parties through two different events but have the same effect. The types of delay are as in Figure 1.2.



Delay in the implementation of construction projects is frequent due to various factors. According to Syed M. Ahmed et al. (2003), some projects are only a few days behind the schedule; some are delayed over a year. This depends on the type of delay, the amount of time needed to resolve the problem, the complexity of the problem and the urgency of the parties involved to resolve the issues.

Projects at the Ministry of Defence, Malaysia (MOD) are also no exception to the situation. Infrastructure development programs for the MOD are very critical as it involves construction projects for military including Malaysian Armed Forces (MAF), Malaysian Army (MA), Royal Malaysian Navy (RMN), Royal Malaysian Air force (RMAF) and also Civilian Departments in MOD. If these construction projects are not properly managed, they

will implicate the level of national defence readiness. MOD's projects are aimed at ensuring that the national defence system can protect the sovereignty and territorial integrity of the country. There are several parties involved in the implementation of the MOD's project namely the users (MAF, MA, RMN, RMAF and Civilian Departments of MOD), Development Division of MOD, Division of Defence Engineering Services (DDES), Public Work Department (PWD), contractors, consultants, government agencies and local authorities. Figure 1.3 shows the organization of project implementation in MOD.

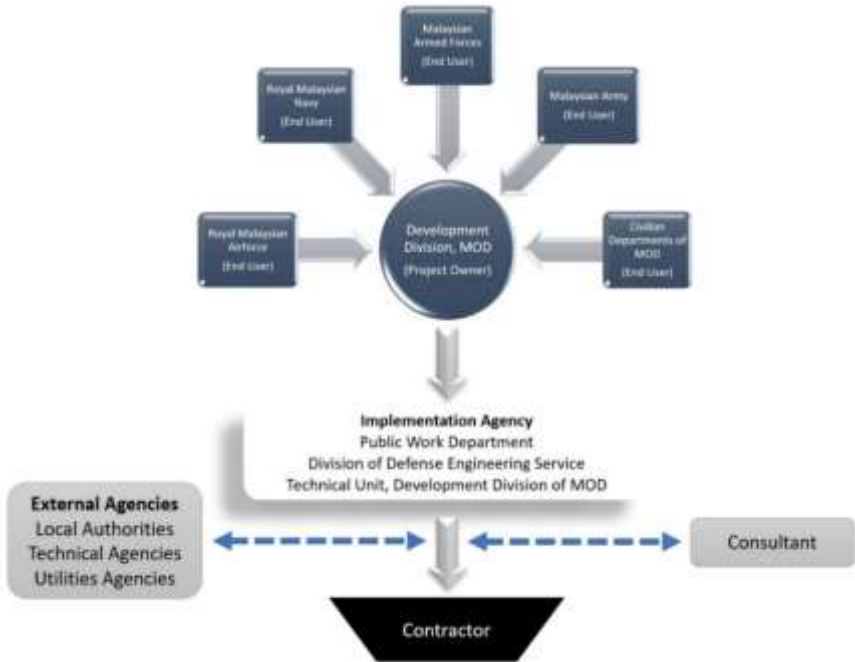


Figure 1.3 Organization of Project Implementation in MOD

The public sector is one of the largest catalysts in the construction industry in Malaysia. The Government has allocated large sums of money for development projects such as the construction of public infrastructure and the facilities of government bodies. It also includes camps and military facilities. Table 1.1 shows the total development budget compared to the overall government budget and gross domestic product for 2010 to 2019 as well as the development budget for MOD.

Table 1.1 Malaysian Budget 2010-2019

| <b>Year</b> | <b>Total Budget<br/>(RM ,000,000)</b> | <b>Development<br/>Budget<br/>(RM ,000,000)</b> | <b>MOD's<br/>Development<br/>Budget<br/>(RM ,000,000)</b> |
|-------------|---------------------------------------|---|---|
| 2005        | 128,278                               | 30,534  | 4,065   |
| 2006        | 143,501                               | 35,807  | 3,530   |
| 2007        | 163,648                               | 40,564  | 4,102   |
| 2008        | 196,346                               | 42,847  | 4,120   |
| 2009        | 206,582                               | 49,515  | 2,663   |
| 2010        | 235,386                               | 52,792  | 2,666   |
| 2012        | 252,469                               | 46,932  | 3,590   |
| 2013        | 253,480                               | 42,210  | 4,038   |
| 2014        | 259,092                               | 39,503  | 3,751   |
| 2015        | 257,766                               | 40,768  | 4,078   |
| 2016        | 252,168                               | 41,995  | 3,945   |
| 2017        | 262,579                               | 44,884  | 4,315   |
| 2018        | 290,350                               | 54,900  | 3,649   |
| 2019        | 314,550                               | 54,700  | 3,737   |

According to Table 1.1, the development budget received by MOD was on average RM3.7 billion between 2005 and 2019. This is a huge number as the annual development budget received by MOD each year is the third highest below transport and education

sectors. This large amount of people's money should be well managed by ensuring that the construction projects implemented are performing well.

With threats from overseas especially involving cross-border terrorism, the readiness of the national defence system cannot be taken lightly. The readiness of defence assets and military personnel is supported by military facilities and infrastructure. Failure to ensure that these facilities and infrastructure are properly provided may interfere with the level of operation of the assets and defence personnel. This includes failure to build military projects within a set time.

As shown in Figure 1.3, there are many parties involved in the implementation of construction projects in MOD. The MOD's Development Division will receive applications from end users along with the requirements for a project. The MOD's Development Division will bid funding from the Ministry of Economic Affairs and then appointing the implementing agency for the project once the budget has been approved. Subsequently, the implementing agency will provide more detailed technical requirements and determine whether the project will be implemented conventional or design built. The appointment of consultants and contractors will be carried out by the implementing agency in accordance with the prescribed project implementation method. The implementing agency will manage the project until it is completed and handed over to MOD. Throughout the process, various issues may arise in terms of finance, change of scope, weather, incompetent team members,

external factors and more. These factors are at risk for delays in carrying out construction work.

## **1.2 Problem Statement**

In general, the Malaysian Government's activities were carried out in accordance with the objectives set out. However, there are still weaknesses in terms of delays in project completion. The weaknesses include negligence in adhering to procedures set by the Government, less careful during planning projects, setting out scope and tender specifications, not regularly monitoring contractors and consultants, lacking skills in project management and less attention to project's impact (Madinah Mohamad, 2017).

The Auditor General of Malaysia has reported in series of reports that MOD projects often experience delays in project implementation. There are few samples extracted from series of Auditor General Report as below: -

- i) Auditor General Report 2014 (Series 1) - Construction of Air Force College, Kepala Batas, Kedah: -

The Auditor General reported that the project was completed with an extension of time (EOT) of 161 days. The project was supposed to be completed within 143 weeks 5<sup>th</sup> November 2012. However, the Project Director (PD) only

issued Certification of Practical Completion (CPC) on 22<sup>nd</sup> July 2013.

- ii) Auditor General Report 2014 (Series 3) - Construction of National Defence Education Centre, Putrajaya: -

The Auditor General reported that until the last audit visit on 29<sup>th</sup> July 2015, the project has been delayed for 282 days due to the very slow performance of the contractor's work. The contractor has applied for an EOT but is not approved for the reason given is unreasonable. Liquidated Ascertained Damages (LAD) has been imposed to the contractor since 24<sup>th</sup> October 2014.

- iii) Auditor General Report 2015 (Series 2) - Construction of Service Technical Centre (STC) for the Maintenance and Repair of Sukhoi SU-30MKM, Gong Kedak Air Base, Terengganu: -

The Auditor General reported the project needs to be completed by the contractor within 78 weeks on 20<sup>th</sup> September 2015. Three EOTs has been approved for 344 days (49 weeks) and the completion date after the third EOT is on 29<sup>th</sup> August 2016. Performance of construction work progress in the first 10 months from March 2014 to December 2014 was unsatisfactory as work progress only reached 3.3% compared to schedule of 39.1%.



As discussed earlier, the construction projects implemented by the MOD are important in ensuring national defence readiness. There are some consequences that will occur if these projects are not implemented on a predetermined schedule. It covers issues of defence asset acquisition, human resource recruitment and deployment of front-line forces.

There are planned and developed construction projects due to the acquisition of new defence assets. Construction project planning is usually in line with the acquisition of such assets, where the infrastructure of placement of these assets is not completed within the prescribed period, the rescheduling of delivery of such assets is required. This will also affect the increase in storage costs besides the availability of preparedness. This can also happen if new human resources are ready to be taken, while their placement in new camps or facilities is yet to be completed.

The major implications of delays in implementing construction projects in MOD are in terms of increased costs and delays in operating a facility. There are many construction projects in MOD that need to be implemented due to the procurement of imported equipment from abroad that need to be operated according to the planned schedule.

One example of a real situation is the acquisition of a very important defence equipment. This equipment was to be installed and operated in 2016. A construction project in a relatively remote

location needs to be built to accommodate this equipment. However, there have been a series of delays and issues that have arisen during the construction of this project which has led to the government having to bear the added cost. The government had to build a temporary structure worth RM10 million to house the equipment it had acquired in 2016. The temporary location where this equipment is located has not been optimally operated. If this equipment is not accepted at that time, then the government will have to bear the high cost of storage by the suppliers while at the expense of the country's defence due to the delay in operating the equipment. Once the construction project was completed in 2018, the government again had to bear the double handling cost to move the equipment from temporary to permanent location.

### **1.3 Aim**

To address the issues raised by the Auditor General as in paragraph 1.1, a study should be conducted to identify the causes of project delays in the MOD to help the government avoid the additional costs incurred as a result of such delays.

## **1.4 Objective**

The objectives of this study are: -

- i. To identify causes for the delay of projects implementation;
- ii. To analyse the significance causes of delay of the project implementation in Ministry of Defence, Malaysia; and
- iii. To recommend preventive measures to prevent delays in the projects of the Ministry of Defence, Malaysia.

## **1.5 Scope of Study**

This research will limit the scope of its study to government agency projects only, specifically Ministry of Defence. The research is bound by the scope of study which is in the Malaysian Government agencies. There may be a limitation on some documents which is classified under Official Secret Act 1972 (OSA). According to OSA 1972, *any document specified in the Schedule and any information and material relating thereto and includes any other official document, information, and material as may be classified as "Top Secret", "Secret", "Confidential" or "Restricted"* (OSA, 1972, p.7). It means that permission will have to be acquired to access to any information restricted by Malaysian Government agencies. However, since the documents are classified, only the information will be available, and the copy of documents will be left out of this research documentation.

- Majid, M. (1994). *Kaedah Penyelidikan Pendidikan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- McMillan, J.H. & Schumacher, S. (1984). *Research in Education*. Boston: Little, Brown & Company Limited.
- Mehdi Riazi, Salman Riazi & Lamari, Fiona (2013) *Public Sector Project Delay: The Malaysian Perspective and the Way Forward*. Proceedings of the 19th CIB World Building Congress, Brisbane 2013: Construction and Society, Queensland University of Technology, Brisbane Convention & Exhibition Centre, QLD, Australia.
- MOF, Treasury Instructions. 2007: Putrajaya.
- Murali Sambasivan and Y.W.S. (2007). Causes and Effects of Delays in Malaysian Construction Industry. *International Journal of Project Management*, pp.517-526.
- N. Hamzah, M.A. Khoiry, I.Arshad, N.M. Tawil and A.I. Che Ani (2011). Cause of Construction Delay – Theoretical Framework. *Procedia Engineering* 20 (2011):490-495.
- N. Hamzah, M.A. Khoiry, I.Arshad, W.H.W. Badaruzzaman and N.M. Tawil (2012). Identification of the Causes of Construction Delay in Malaysia. *International Journal of Civil and Environmental Engineering*. Vol:6, No.12.
- Nurul Alifah Jatarona, Aminah Md Yusof, Syuhaida Ismail and Chai Chang Saar (2016). Public Construction Projects Performance in Malaysia. *Journal of Southeast Asian Research*. Vol. 2016 (2016).
- Syahira Nabilla and Khairulzan Yahya (2018). Causes and Effects of Delays in Construction Industry. *Universiti Teknologi Malaysia*.

## REFERENCES

- Ahmed, S.M., Azhar, S., Kappagtula, P. and Gollapudil, D. (2003).  
Delays in Construction: A Brief Study of the Florida  
Construction Industry. Proceedings of the 39th Annual ASC  
Conference, Clemson University, Clemson, SC. Pp. 257-66.
- Alaghbari and W.A.M. (2005). Factors Affecting Construction  
Speed of Industrialized Building Systems in Malaysia.  
Universiti Putra Malaysia.
- Azlan Othman and Syuhaida Ismail (2014). Delay in Government  
Project Delivery in Kedah, Malaysia. Universiti Teknologi  
Malaysia.
- Drewin, F.J. (1982). Construction Productivity. New York. Elsevier.  
150.
- Gray, L.G. and Airasian, P. (2003). Educational Research:  
Competencies for Analysis and Applications. 7th ed. New  
Jersey: Merrill Prentice Hall.
- Hasmori, Said, Deraman, Abas, Nagapan, Ismail, Khalid and Roslan  
(2018). Significant Factors of Construction Delays Among  
Contractors in Klang Valley and its Mitigation. International  
Journal of Integrated Engineering. Pp.32-36. Vol.10 No.2.
- JKR, Garis Panduan Pengurusan Pembinaan Projek Reka dan Bina.  
2007: Kuala Lumpur.
- JKR, Standard Form of Design and Build Contract PWD Form DB  
(Rev. 1/2010). 2010: Kuala Lumpur.
- Madinah Mohamad (2017). Laporan Ketua Audit Negara Siri 2 Bagi  
Tahun 2016. Putrajaya: Jabatan Audit Negara.

Wa'el Alaghbari, Mohd. Razali, A. Kadir, Azizah Salim and Ernawati (2007). The Significant Factors Causing Delay of Building Construction Projects in Malaysia. *Engineering, Construction and Architectural Management*. Vol. 14 Iss 2 pp. 192 – 206.