

**EMERGENCY PREPAREDNESS BY RESPONDERS
AT THE PENANG INTERNATIONAL AIRPORT**

**By
EH BON A/L EH KIU**

**Project Paper submitted in partial fulfillment of the requirements for
the Degree of Master of Science (Emergency Response and Planning)**

**In the Faculty of Engineering,
University Putra Malaysia**

October 2001

FK 2001 79

DEDICATION

To all staffs of Penang Airport Police Station, Security Unit of Malaysia Airports Sdn. Bhd., Fire and Rescue Unit of Malaysia Airports Sdn. Bhd., and Emergency Department of Penang Hospital who are always alert to the call of duty to render the best of their abilities to the public. It is no doubt that, they will set the ultimate courage, skill, sense of purpose and highly commitment to their call of duties to make sure that the security of Penang Airport is safe for travelers.

EMERGENCY PREPAREDNESS BY RESPONDERS AT THE PENANG INTERNATIONAL AIRPORT

By

Eh Bon a/l Eh Kiu

Supervisor : Associate Professor Dr. Fakhru'l-Razi Ahmadun

Faculty : Faculty of Engineering

Nowadays the public is more aware of their safety especially the travelers. It is very important that the airport plan clearly reflect in accordance with the national aviation security programme, responsibility for the evaluation of all potential violent threats, whether they affect aircraft on the tarmac or in flight, or buildings at the airport. This study was conducted to assess the level of emergency preparedness by the responders at the Penang International Airport pertaining to the security system. The indication of "room for improvement" must be considered and attended to immediately so as to preserve greater security in the near future.

PERSEDIAAN MENGHADAPI KECEMASAN OLEH PIHAK BERTANGGUNGJAWAB DI LAPANGAN TERBANG ANTARABANGSA PULAU PINANG

Oleh

Eh Bon a/l Eh Kiu

Penyelia : Profesor Madya Dr. Fakhru'l-Razi Ahmadun

Fakulti : Fakulti Kejuruteraan

Sejak kebelakangan ini, orang awam sedar tentang keselamatan diri mereka khususnya melibatkan individu yang seringkali menggunakan perkhidmatan udara. Dalam hubungan ini, adalah amat penting perancangan keselamatan lapangan terbang perlu mematuhi semua syarat yang terkandung di dalam Program Keselamatan Penerbangan Awam Kebangsaan demi menghindarkan daripada apa jua bentuk ancaman keselamatan yang melibatkan pesawat sama ada yang berada di landasan atau dalam penerbangan. Demikian juga tentang keselamatan terhadap bangunan di lapangan terbang perlu diberi perhatian sewajarnya. Kajian ini dibuat untuk melihat tahap kesediaan menghadapi kecemasan oleh pihak yang bertanggungjawab di Lapangan Antarabangsa Pulau Pinang berhubungkait sistem keselamatan. Terkesan petunjuk bahawa terdapat "ruang perlu diperbaiki" hendaklah diberi perhatian dan diambil tindakan segera demi mempertingkatkan tahap keselamatan di masa yang terdekat.

ACKNOWLEDGEMENT

I would like to express my sincere appreciation and gratitude to the following individuals and departments for their encouragement, kind cooperation and assistance throughout my study.

Associate Professor Dr. Fakhru'l-Razi Ahmadun, my project supervisor whose always spared his valuable time, untiring effort and wisdom have enlightened and guided me in facing the challenges in completing this thesis. Associate Professor Dr. Ir. Mohamed Daud, Associate Professor Dr. Ir. Nor Mariah Adam, Ir. Hj. Fuad Abas and Puan Aini Mat Said, other lecturers, Rosli Bin Saleh and Amnat a/l Perat whose advice, lectures and moral support greatly helped me in the preparation of this thesis. I wish to acknowledge my sincere appreciation to YDH Tan Sri Norian Mai and Royal Malaysia Police for giving me this opportunity to further my studies. I also take this opportunity to convey my sincere appreciation to all my classmates, who are ever willing to give their hands, shared their experiences and supported me thick and thin during my studies.

Last but not least, my beloved wife Nue Suan a/p Endin Keau who always by my side and give her encouragement in completing this programme. I shall not forget my children, Nareeda Champakeow, Maleesa Champakeow and Shatri Champakeow for whom I strive for knowledge and they have to sacrifice their father's love for me to succeed.

LIST OF TABLES

Table 1	Loading AFRS Vehicles
Table 2	Number of staff involved in study
Table 3	Mean & Standard Deviation of Variables
Table 4	Airport Security staff's perception
Table 5	Fire Department staff's perception
Table 6	Police Department staff's perception
Table 7	Medical Department staff's perception
Table 8	Breakdown of respondents by ethnic group
Table 9	Breakdown of respondents by age grouping
Table 10	Breakdown of respondents by highest academic achievement
Table 11	Breakdown of respondents by marital status
Table 12	Breakdown of respondents by years of service
Table 13	Breakdown of respondents by contact person In case of emergency
Table 14	Breakdown of respondents by their statement of incidents

LIST OF FIGURES

- Figure 1 Level I - Arrival hall at Penang International
Airport
- Figure 2 Level II - Departure hall at Penang International
Airport
- Figure 3 Mean & Standard Deviation of variables
- Figure 4 Breakdown of respondents by period of training
- Figure 5 Breakdown of respondents by number of incidents
- Figure 6 Breakdown of respondents by their opinion on the
overall safety level

LIST OF ABBREVIATION

AES	Air Emergency Service
SPSS	Statistical Package for the Social Sciences
MAS	Malaysian Airline System
MAB	Malaysia Airports Berhad
KLIA	Kuala Lumpur International Airport
AFRS	Airport Fire and Rescue Service
ICAO	International Civil Aviation Organization
RIV	Rapid Intervention Vehicle
ULFT	Ultra Large Foam Tender
MPV	Multi Purpose Vehicle
ASRG	Aviation Security Response Group
ASIST	Airport Security Incident Support Team
ASRC	Aviation Security Response Centre
NSC	National Security Council
KLIAB	Kuala Lumpur International Airport Berhad

TABLE OF CONTENTS

	Page
DEDICATION	ii
ABSTRACT	iii
ABTRAK	iv
ACKNOWLEDGEMENTS	v
DECLARATION	vi
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBREVIATIONS	ix
CHAPTER ONE	
INTRODUCTION	1
1.1 Background of Penang International Airport	1
1.2 Problem Definition	2
1.3 Objective of Study	5
CHAPTER TWO	
LITERATURE REVIEW	6
2.1 Introduction	6
2.2 Airport Operation	9
2.3 Flight Services	11
2.4 Airport Security	11
2.5 AFRS Vehicles	16
2.6 Threat to Civil Aviation	19
2.7 Source of Threats	21
2.8 Type of Threat	21

2.9	Aviation Security Response	23
2.10	Aviation Response Structure	24
2.11	Crisis Management at the airport level	25
2.12	Crash-Landing Exercise	28
2.13	Summary	29

CHAPTER THREE

METHODOLOGY	30	
3.1	Experimental set-up	30
3.2	Self Assessment of Level Preparedness	31
3.3	Analysis Tools	32

CHAPTER FOUR

RESULTS AND DISCUSSIONS	33	
4.1	Results	33
4.2	Airport Security Unit	35
4.3	Airport Fire and Rescue Department	35
4.4	Police Department	36
4.5	Emergency Department (Hospital)	37
4.6	Respondents' Background	38
4.7	Statistical Test	45
	Correlation	45
	T-test	46
	ANOVA	46

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION	50	
5.1	Conclusion	50
5.2	Recommendation	50

BIBLIOGRAPHY

APPENDICES

- Appendix A : Fire Services Inspection Report
- Appendix B : Questionnaire (Malay version)
- Appendix C : Questionnaire (English version)
- Appendix D : Airport Emergency Plan
- Appendix E : Domestic Fire Plan



CHAPTER ONE

INTRODUCTION

1.1 Background of Penang Airport

The Penang Airport is located at GR OX 535860, Bayan Lepas, Barat Daya District in Penang. This airport was built in January 1976 and completed on the 1st of December 1978 within the area of about 817 acres. It was gazetted as a controlled area L.N101/94. On the west of the airport is Bayan Lepas town and Free Trade Zone area, while on the east and south east are Batu Maung new village, Pulau Jerjak, Permatang Damar Laut village and the open sea.

The effectiveness of response during emergencies depends on the amount of planning and training performed. For emergency evacuation, the personnel must know the use of floor plans in the airport that clearly show the emergency escape routes and safe or refuge area. The action by AFRS personnel must comply with Civil Aviation Act and regulations 1969, Aviation Offences Act 1984, Airport and Aviation Services (Operating Company) Act 1991 and Civil Aviation Regulations 1996.

1.2 Problem definition

Although the tragedy experienced by Singapore Airlines on 30 October 2000 at Chiang Kai Shek airport Taiwan which killed 81 people (The Star : 4th November 2001) did not happened at Penang International Airport but the relevant agencies must always be alert for any eventualities such as explosion, fire, hijacking of aircraft, act of sabotage and others. Several incidents occurred at the Penang airport between 1993 to September 2000 are as follows :-

1.2.1 On 22nd Jun 1993, a communication set belonging to Malaysia Airline System was reported lost at Arrow Bridge No.6

1.2.2 On 22nd July 1993, the hydraulic landing gear of Cathay Pacific was detected malfunction.

1.2.3 On 14th February 2000, Transmile Cargo aircraft lost a communication set.

1.2.4 On 29th September 2000, two Pakistani were found dead at Frankfurt, Germany and Sharjah, UEA airport respectively. Both were reported to have slipped into

the wheel gear undercarriage of Lufthansa aircraft when it was at the Penang airport.

Initial investigation carried out as to how the incidents happened, the result proved that the personnel on duty did not adhere to the existing regulations as contributing factors to the incidents and also inadequate security precaution.

Beside the above-mentioned incidents took place at Penang International Airport, Tanjung Kupang, Johor tragedy was the worst air-crash disaster in Malaysian aviation history which took place on 4th December 1977 when a MAS Boeing 737, carrying 93 passengers and seven crew, exploded and crashed in the swampy forests.

Tanjung Kupang hit world headlines, and nation was in shock. Among the many VIPs on board were former Agriculture Minister Datuk Ali Ahmad, the then newly-accredited Cuban Ambassador to Malaysia Mario G. Inchausteghi and his wife, the Director-General of Public Works Department Tan Sri Mahfoz Khalid, the Director of Public Works (Armed Forces Division) Datuk Khalid Mohamad, the Deputy Director-General of the Fisheries Department Abu Bakar Othman Merican, World Bank officials O.D. Hoerr and S.S. Naime, and a

leading fertility specialist attached to the Department of Obstetrics and Gynaecology at University Hospital, Professor I.S.Puvan.

It is interesting to note that, on the night of December 4, Flight MH653 took off from Penang International Airport at 7.21 pm, bound for Kuala Lumpur and Singapore, with 93 passengers and seven crew on board. At 7.47 pm, the aircraft flew over Batu Arang and had begun its descent to Subang Airport when pilot informed the Subang airport control tower that " We have an emergency on board". Initial suspicion lay heavily on the Japanese Red Army, a terrorist group that advocated world revolution by force. Other terrorist groups that were suspected included the Ananda Marga, an Indian religious sect, and even the West German Baader-Meinhof group. But anyway, all these theories were subsequently disproved.

Above all, the Tanjung Kupang air crash reflected the lack of proper security measures at the smaller airports in the country at the time, and the tragedy prompted a full review of security arrangements at all airports throughout the country. Pilots Associations, stopped work for 24 hours, in protest against what they described as lax airport security (NSTP e-media Fri. 18 August 2000).

1.3 Objective of Study

1.3.1 To measure the awareness and preparedness level of Police, Airport Fire and Rescue Service (MAB), Airport Security Sdn. Bhd. (MAB) and Hospital Emergency Department.

1.3.2 To evaluate the condition and equipment of the relevant agencies, especially Airport Fire and Rescue Service (MAB).

1.3.3 To forward a recommendation to the relevant agencies.

BIBLIOGRAPHY

- Advisory Circular, Aviation Security-Airports
<http://cas.fas.gov/foia/circulars/avsecap.html>
15/10/2001
- Anderson, W.; *Disaster warning and communication process in two Communities*, Commune (1992) pg. 92-104
- Aviation Weeks, Business & Commercial Aviation, July 2001
www.AviationNow.com/BCA
- Bairy A. Turner and Nick F. Pidgeon, *Man-Made Disasters*, Butterworth Heinemann, 1975
- Ching Eng Leong, *Assessing The Psychological Skill of Factory Fire Squad Responding To Emergency at Sungai Way Free Industrial Zone, Petaling Jaya, Malaysia*, May 2000
MS (ERP) project paper, University Putra Malaysia,
(Unpublished)
- Christoper J. Blow, *Airport Terminals*, Reed Educational and Professional Publishing Ltd , 1996
- Civil Aviation Act 1999 And Regulations*, MDC Publishers Printers Sdn. Bhd., 1997
- Drabek, *Social processes in disaster : family evacuation*, social Problem, 16 (1969)
- Edith Cowan University, Australia, *Managing Aviation Threats and Incidents*, 11 April 2001
- Emergency Preparedness, *Facts of city of Tullahoma Emergency Preparedness*,
<http://www.Tullahoma-tn.com/emergency.html>
15/10/2001
- Florentino J Baguio, *A Test of Disaster Preparedness, The PAL Mishap In Bacolod Rescue*, 22 March 1998
<http://www.geocities.com/CapitolHill/Senate/7210/s2paldpt.html>
15/10/2001

Fritz, Disaster, In : R.K. Merton and R.A. Nisbet (Eds). *Contemporary Social Problems*, Harcourt, New York, NY, (1961)

Majlis Keselamatan Negara, *Arahan No. 20*, Bahagian Keselamatan Negara, Jabatan Perdana Menteri

MD. Salleh bin Sarbani, 1999. *Kesediaan Pasukan Hazmat Negeri Pulau Pinang Menghadapi Insiden Bahan Kimia Berbahaya*, MS (ERP) project paper, Universiti Putra Malaysia (Unpublished)

Michael S. Nolan, *Fundamentals of Air Traffic Control*, Wadsworth Publishing Company, 1994

Norman Arhford, *Airport Engineering*, John Wilney & Sons, Inc., 1992

Paul Stephen Dempsey, *Airport Planning and Development Handbook*, McGraw-Hill, 1999

Quarantelli, E.L.; Chemical disaster planning at the local community level *Journal of Hazardous Material*, 8 (1984)

Ray Wilkinson, *Aircraft Structures and Systems*, Addison Wesley Longman Limited, 1996

Richard De Neufville, *Airport Systems Planning*, The MIT Press, 1976

Rigas Doganis, *The Airport Business*, Routledge 11 New Fetter Lane, London, 1992

Soh Chai Hock, Prof. Datuk Dr., *Guide To Fire Protection In Malaysia* SP-Muda Printing Sdn. Bhd., January 2000