

出國報告（出國類別：進修）

飛航安全議題的務實解決方案

服務機關：桃園國際機場股份有限公司

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派赴國家/地區：新加坡

出國期間：113年8月11日至113年8月17日

報告日期：113年11月15日

摘要

此出國進修案為新加坡民用航空局(Civil Aviation Authority of Singapore, CAAS)開設之「Resolution of Safety Issues」課程(簡稱為RSI)，譯為飛航安全議題的務實解決方案，由其下轄 Singapore Aviation Academy 負責綜整、協調與執行此課程，而職為提升飛航安全管理相關專業職能，強化緊急應變決策能力，及提升空側安全策略與規劃能力，以因應飛航安全威脅多樣化之國際環境，交流互動與知識分享學習，學習國際組織對於空側安全最新之規定及應用，故參加此課程。

課程共五天，上課地點安排於 Crowne Plaza: Changi Airport，與尹索比亞、斐濟、香港、肯亞、南韓、馬來西亞、奈及利亞、阿曼、新加坡、索馬利亞、南非、泰國、多哥、辛巴威、約旦等各國民航界人士共同參訓，主要講師為 Kong Cheong Tuck，工作資歷為新加坡航空、新加坡民用航空局、ICAO、現為新加坡民用航空局專任講師暨檢查員，課程內容包含：

- ICAO Resolution of Safety Issues Documentation
- Approaches to Resolution of Safety Issues
- Philosophy of enforcement actions
- Inspector responsibility and authority
- Safety and Just Culture
- Errors and Violations
- Types of unsafe behavior
- The Reason Model
- Contents of an Enforcement Manual
- Planning of investigation
- Interpretation of regulations
- Types of evidence
- Preparation & planning of interview
- Interview techniques
- Auditing process and expectations
- Common enforcement decision tools
- Enforcement decision process (EDP)
- Risk assessmen

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壹、目的

本出國案為提升飛航安全管理相關專業職能，強化緊急應變決策能力，及提升空側安全策略與規劃能力，以因應飛航安全威脅多樣化之國際環境，交流互動與知識分享學習，學習國際組織對於空側安全最新之規定及應用，故職奉派參加此課程。

而依據 CAAS 之簡介，本課程推薦參加對象為安全監督環節之安全政策設計、監管、稽核、與功能遵循相關者，並預期使完訓者具備制定和應用適當程序以滿足安全監管流程的能力，制定並應用適當的程序和流程解決安全問題、準備執行手冊和指導資料、在調查和訪談中採用最佳實行方法、了解國家層面飛航安全關注議題，課程內容涵蓋與解決安全問題相關的國際民航組織文件、執行流程、安全管理、訪談和調查的原則和技巧。

職為桃園國際機場公司航務處值班人員，航務處職掌即包含停機坪之使用規劃及管理、空側區地面安全作業秩序之管理、空難、意外事故、危險事件等影響飛航安全事項之通報及處理、機場四週有礙飛航安全物體之通報及防止飛鴿、鳥類、牲畜侵入、航空器、空側區域及機場建築物之火災消防搶救、緊急應變計畫之救護作業、民用航空器遭遇劫機或破壞、爆裂物恐嚇事件、核生化事件、空側緊急傷病患及死亡、運送糾紛(霸機)事件之配合處理、空側駕駛許可證及空側區各型作業裝具、車輛通行證管考核發、本場風災、空難、飛安事故、爆裂物、毒性化學物質、劫機、輻射、國內線航班技降等應變處理作業程序及演練執行等，故此課程可充分提供空側管理者對空側安全管理的新思維與多種角度之整體考量。

貳、過程

一、行程

桃園國際機場公司航務處陳尹工程師政，奉准於 113 年 8 月 11 日至 8 月 17 日

赴新加坡參訓本課程：

行程如下

日期	地點	行程
113 年 8 月 11 日	台灣桃園->新加坡	啟程
11.年 8 月 12 日-8 月 16 日	新加坡	上課地點 Crowne Plaza: Changi Airport
113 年 8 月 17 日	新加坡->台灣桃園	返程

二、課程表

Resolution of Safety Issues					
12 - 16 Aug 2024					
	Day-1	Day-2	Day-3	Day-4	Day-5
	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug
09:00 - 09:30	Registration / Opening	4b. Exercise: Errors & Violations	6b. Discussion on Exercise	9b. Discussion on Exercise	Review and discussion on USOAP CE8 PQs
09:30 - 10:15	Course Introduction & Overview	4b. Discussion on Exercise	7. Interview Skills	10. Deciding a course of Action	
10:15 - 10:45	Morning Break				
10:45 - 12:00	1. Overview of RSI	5a. Enforcement Manual	8a. Managing Investigations	11a. Case Study of SQ006	Course review
12:00 - 13:00	2. RSI Approach	5b. Enforcement Manual Exercise	8b. Exercise: Managing Investigation	11b. More Case Studies of accidents	
13:00 - 14:00	Lunch				
14:00 - 15:15	3. Philosophy & Policy	6a. SSP and SMS Enforcement	9. Enforcement Actions	11b. Discussion of case study accidents	
15:15 - 15:45	Afternoon Break				
15:45 - 16:30	4a. Error & Violations	6b. Exercise on SSP and SMS Enforcement	9b. Exercise: Enforcement Actions	Review and discussion on USOAP CE8 PQs	
16:30 - 17:00	Q & A	Q & A	Q & A	Q & A	

三、課程內容

1. RSI 概述：兩方法、安全監督系統八關鍵要素、RSI，RSI 為安全監督系統第八項關鍵要素，可分別以主動與被動方法執行，流程為辨明安全議題、追蹤安全議題、強制執行改善作為、並追蹤相關安全建議。

In Summary

- Two approaches to RSI

- ICAO's 8 critical elements of a safety oversight system

- Critical Element 8 – Resolution of Safety Issues

- Identification of Safety Issues
- Follow-up of Safety Issues
- Enforcement
- Follow-up of Safety Recommendations

2. RSI Approach : RSI 方法可分為主動與反應兩方法，主動法透過各種稽核與檢查區辨出飛航安全相關議題，觀察其完整發現結果與改善措施，強制執行作為，層次提升之因素；反應式方法可從自願/強制報告系統與事件調查中確立強制執行作為的方向，依法從行政處罰至刑責。

Summary

Proactive Approach

- Identification through audit/inspection
- Observations and findings
- Corrective Actions
- Enforcement Actions
- Escalation Factors

Reactionary Approach

- Reporting systems and investigations
- Report Analysis
- Enforcement Decision Process (EDP)

3. Philosophy & Policy of RSI : RSI 的哲學與政策，依據 ICAO DOC 9734 Safety Oversight Manual 定義國家之義務、政策，與八關鍵要素(CE)，並以此建立民航監理管機關(民航局)之督導與稽核流程，並以主動積極、鼓勵符合且優於法規要求，並建立相互信任關係，以此建立並推行公正文化，並堅定執行應有之作為。

Summary

- 8 Critical Elements of a safety oversight system

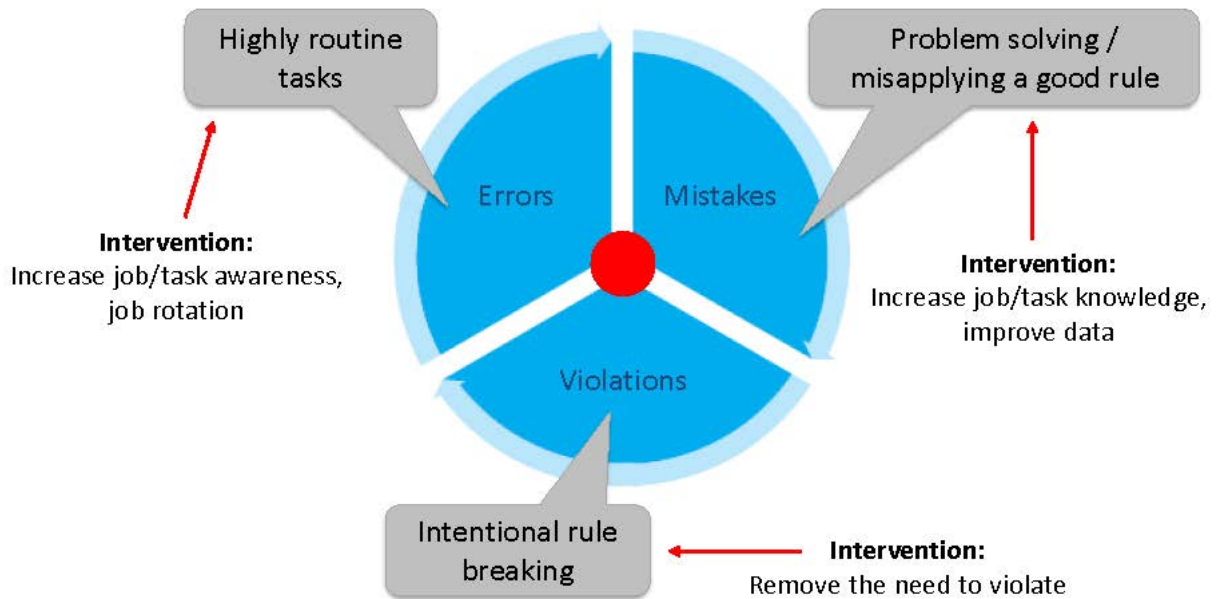
- CAA Auditing Process

- Enforcement Policy and Philosophy

1. Voluntary Compliance
2. Promoting Compliance
3. Trust and Confidence
4. Fairness and Firmness

4. Error & Violations：失誤與違規，定義失誤、錯誤、違規，明辨其成因，制定改善策略，以及持續進行改善作業的可行策略與公正文化。

Effective Interventions and Accountability



5. Enforcement Manual：建立執行手冊的規範依據，依據 ICAOSARPS 建立執行手冊與細部內容，及各層面規劃與執行之指引。

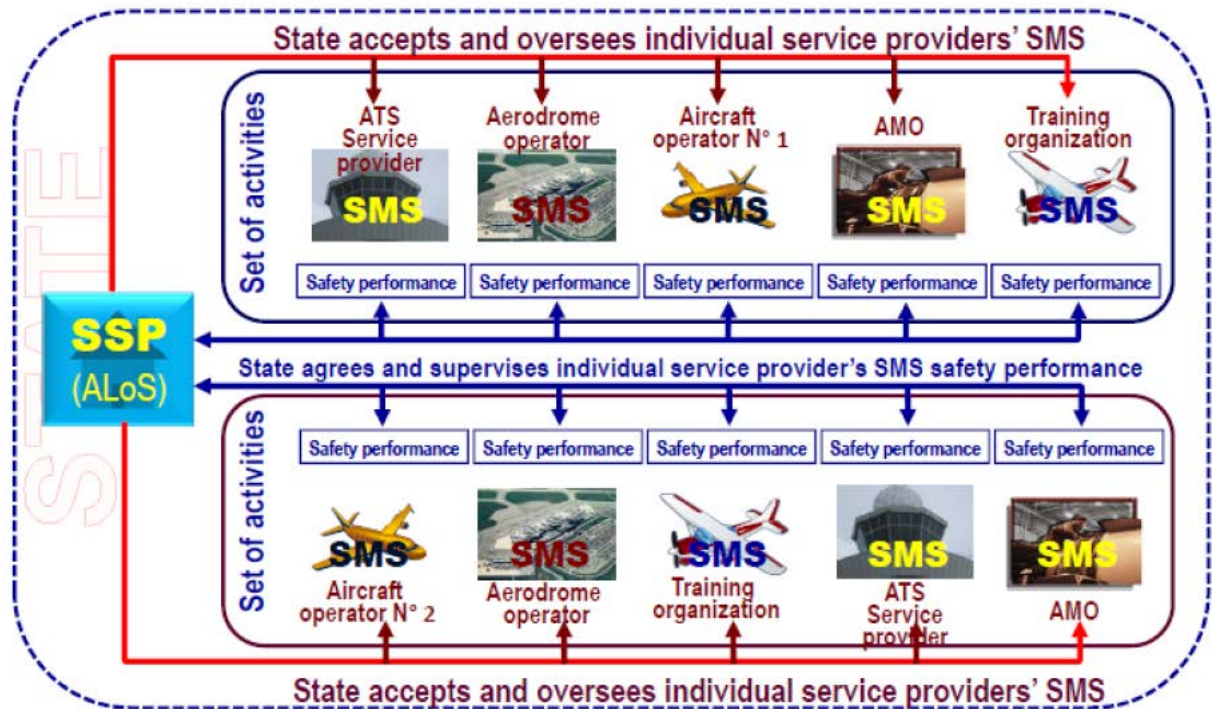
Enforcement Model Manual

List of Contents

Glossary	Chapter 8	Special investigative procedures
Chapter 1 Policy Overview	Chapter 9	Case Reports
Chapter 2 Inspection	Chapter 10	Determining a Course of Action
Chapter 3 Surveillance Operations	Chapter 11	Administrative Action
Chapter 4 Detection	Chapter 12	Sanctions
Chapter 5 Analysis of Legislative Provisions	Chapter 13	Enforcement for Safety Management System
	Chapter 14	Technical Information
Chapter 6 Investigations	Appendix	A, B and C
Chapter 7 Covert Operations		

6. SSP & SMS Enforcement : 國家安全計畫與安全管理系統之執行，以 SSP 為大框架，達成可接受之安全水準為前提，制定可執行之安全管理系統以達成目標，並持續系統之有效運作與改進，促成正向循環。

Relationship between SSP and SMS



7. Interview Skills：訪談技巧，此課程旨在根據目的建立學員之實務訪談技巧，根據航務人員訓練與工作經驗，訪談的目的與事前準備，訪談的執行與提問方式，細節紀錄，所得資料與報告之整理皆須符合規範之要求。

Interview Structure

General Tips

- Questions should be brief, clear and unambiguous
- Relevant to required information and presented one at a time
- Terminology or jargon that may confuse or intimidate witnesses should be avoided
- Some witnesses are able to recall more detail when hearing the recording of themselves initially describing the situation
- Nearing the end of the interview, provide opportunity for other information or questions from the witness

8. Managing Investigation：事件調查管理，事故之調查，旨在避免運輸事故之再發生，不以處分或追究責任為目的，定期與不定期之檢查、稽核可確認飛航之運作是否符合安全標準，事故調查則為事故產生後根據事實資料與調查技術技巧分析主要因素與次要因素，提出改善建議，促進飛航安全。

Summary

- Investigations vs inspection/audits

- Planning of investigation

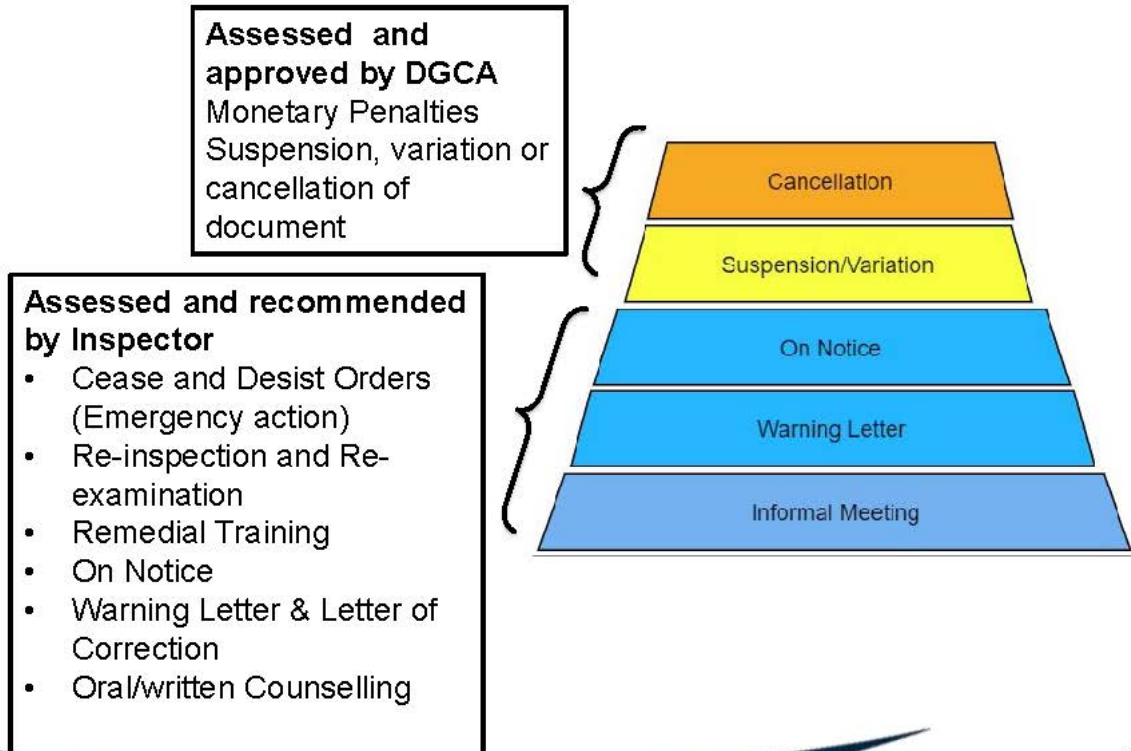
- Investigative personnel

- Analysis of regulations

- Evidence and note taking

9. Enforcement Actions : 強制執行行動，任何強制執行作為的目的，皆為避免傷亡、財損，促進遵循規範，發現與消彌潛在危險。

Types of Administrative Actions



10. Deciding a course of action：決定行動執行的進程，檢查者、稽核者的角色為依據事實分析嚴重性與頻率與 Reason Model 決策樹，系統性採取相應作為。

Overview

- Types of Enforcement Action

- Inspectors' Role

- Reason Model

- Penalty Table

- Enforcement Decision Process

- Enforcement Flowchart
- Risk Assessment
- Deviations

11. Discussion of case study

在此部分，比較特殊的案例是卡達航空已因低油料宣告緊急狀況，而吉祥航空卻拒絕讓出空域，事後調查發現吉祥航空油料尚未到緊急狀況，導致吉祥航空正副駕駛皆被停飛六個月，減班 10%並停止擴張與聘用外籍組員。

Just Culture – Reviewing Occurrences

Qatar Airways and Juneyao Airlines incident:

- On August 13th 2011, a Qatar Airways jet was circling over Shanghai's Pudong International Airport due to bad weather when it radioed it was short of fuel and asked to land instead at the city's other main airport, Hongqiao International
- However, another pilot from Juneyao Airlines jet repeatedly refused requests to make way even after the other issued a "mayday" call, arguing that his aircraft also was short on fuel



Just Culture – Reviewing Occurrences

Qatar Airways and Juneyao Airlines incident:

- Results of the investigation found that the airliner who refused to give way had enough fuel to stay airborne for 42 more minutes while the "mayday" airliner had only enough fuel for 18 more minutes of flight

What was the action that should have been taken?



Just Culture – Reviewing Occurrences

Qatar Airways and Juneyao Airlines incident:

- Civil Aviation Administration of China (CAAC) revoked the license of the Juneyao Airlines pilot and the co-pilot's flight was suspended for six months.
- All foreign flight crews of the airline also will be required to participate in at least 40 hours of training on Chinese aviation regulations.



Just Culture – Reviewing Occurrences

Qatar Airways and Juneyao Airlines incident:

- Juneyao Airlines was ordered to reduce its flights by 10 per cent and the carrier would be temporarily barred from carrying out plans for expansion or hiring any foreign flight staff.
- Juneyao Airlines apologized, stating "Regardless of the circumstances surrounding the incident, it was the pilot's fault to reject the order from the air traffic control,"



12. Review and discussion on USOPA CE8 PQs：探討關於全球安全監督查核計畫(USOAP)之關鍵八要素(CE8)標準問題(PQ)，用以審視相關事項績效指標及實施成效。

Priority PQs

To assess :

a) States' capability of providing safety oversight **core** functions;

b) States which are undergoing **instability or major structural change**;

c) **advanced States** if their **basic functions** are still being provided effectively

CE 8 PPQs

There are 7 CE 8 PQs which are classified as PPQs
AIR 5.548

Has the AID (Airworthiness Inspection Division) **implemented** a documented process and/or a method to **track identified deficiencies, to evaluate corrective actions** presented by air operators and/or AMOs and to take appropriate actions, up to and including enforcement measures, to ensure the **resolution** of the identified deficiencies and safety issues **in a timely manner**?



CE 8 PPQs

AGA 8.413

Has the aerodrome regulatory authority developed and **implemented a process to take actions, including enforcement**, if deficiencies found during surveillance activities are **not rectified within a reasonable** time by the aerodrome operator?

CE 8 PPQs

AIG 6.425

Has the State, as the **State receiving safety recommendations from other States**, established and **implemented procedures**:

- to monitor the progress** of any action taken in response to these safety recommendations, and
- to ensure that it **informs the proposing State within 90 days of the preventive action taken** or under consideration or the reasons why no action will be taken?



CE 8 PPQs

AIG 6.427

Has the State, as the State conducting the investigation, established and **implemented** procedures to ensure that **intended safety recommendations are included in the draft final report forwarded to the States and organizations concerned**?

CE 8 PPQs

AIG 6.507

Has the State **established an accident and incident database, in a standardized format**, to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine any preventive actions required?

AIG 6.501

Has the State established and **implemented** (through the necessary legislation, procedure and guidance to the industry) a **mandatory incident reporting system to facilitate the collection of information on actual or potential safety deficiencies**?

AIG 6.511

Does the State **analyze the information contained in its accident/incident reports and database** to determine any required preventive action?



USOAP Foundational PQs

- The term “foundation of an SSP” refers to a subset of the USOAP PQs that have been identified as fundamentals and are considered as prerequisites for sustainable implementation of the full SSP.
- SSP foundational PQs are grouped into subject areas derived from Annex 19 and Doc 9859.
- There are a total of 299 Foundational PQs.



USOAP Foundational PQs

- States can prioritize and address these PQs when conducting the SSP gap analysis or while defining the SSP implementation/action plan.
- The concept of “foundation of an SSP” is intended to replace the 60 per cent EI score previously used in the GASP as a threshold to progress into implementation of the SSP.
- The intent is that these PQs be included in the SSP implementation planning to ensure sustainability.



Shaded PQs

- All PQs which are shaded will be required to be validated on site.
- The consolidated CE 8 which are required to be validated onsite is marked with ***



參、心得及建議：

有幸參加了新加坡民航局（CAAS）舉辦的 5 天專業訓練，訓練主要包括以下主題：Resolution of Safety Issues, RSI, 解決飛航安全問題的兩種方法（Two Approaches to RSI），ICAO 安全監查系統的 8 項關鍵元素（8 Critical Elements of a Safety Oversight System），USOAP CE 8 PQS (Universal Safety Oversight Audit Programme - Critical Element 8)，這些內容不僅提升我對 ICAO 標準及各國進行安全監管的了解，也提供了具體的操作流程與策略，幫助我應對機場空側的安全挑戰。

安全問題的解決 (RSI) 及其重要性，在訓練中深入了解了安全問題的解決過程，特別在安全管理系統中的應用，RSI 的核心是迅速且有效地識別、處理及解決飛航安全中的相關議題。ICAO 強調，所有國家都必須能夠依照國際標準，確保其安全管理系統能夠持續運行並及時解決安全隱患，不僅涉及到問題的追蹤與報告，更涉及到如何通過系統化的風險評估來減少安全事件的發生。

兩種主要方法：一是基於風險評估的預防性措施，二是基於事件後分析的修正措施，預防性措施強調在事件發生之前即進行風險識別與緩解，而修正措施則是在事件發生後進行根本原因分析，確保問題不再重複，兩者的有效結合能夠顯著提升機場在安全管理上的水準。

而 ICAO 監管系統的 8 項關鍵元素為安全監管系統有效運作的基本框架，每一項都至關重要，缺一不可。特別是其中涉及到安全監理和自願報告系統的部分，這讓我反思目前機場內是否已建立充分的公正文化以即時處理各類安全風險。

RSI 不斷強調對飛航安全議題應有系統且持續建立正向循環，面對突發安全事件或隱患時，需迅速反應，亦須持續確認 SMS 的有效運作確保問題能夠根本性解決，並預防問題再次發生，且預防可能之風險，這一點對於我日常的安全管理工作提供了很好的啟示。USOAP - 國際安全監管能力評估，在這一部分，訓練介紹了 ICAO 的 USOAP (Universal Safety Oversight Audit Programme) 如何評估國家或機場的安全監管能力。通過學習 USOAP，更加明白了國際飛航安全監管標準及具體要求，尤其是 CE 8 對於飛航安全監管能力的強化，讓我對如何改進我所在機場的安全監管體系有了更清晰的方向。

訓練中所學讓我意識到安全管理系統應該更強調對風險的預測與早期識別，建議加強機場內部的風險評估流程，並完善問題追蹤與回報機制，以確保每個安全隱患都能得到即時處理，隨時更新最新的安全管理理念和國際標準，未來應鼓勵公司團隊跨處室組團系統性參加此類型專業訓練，保持人員與經營團隊競爭力的持續精進。

總結來說，此次參訓是寶貴的學習機會，無論是對 ICAO 的安全監管標準，與 RSI 的實務操作，都讓我收穫頗豐，定將所學積極應用於工作中，為提升飛航安全作出貢獻。

參考文獻

Resolution of Safety Issues 講義與投影片，CAAS。

附錄

課程證書



This certificate is presented to

Yin Cheng

for having participated in the

Resolution of Safety Issues Course
12 to 16 August 2024

A handwritten signature in black ink, likely belonging to the Director of the Singapore Aviation Academy.

Director (Singapore Aviation Academy)
Civil Aviation Authority of Singapore

A handwritten signature in black ink, likely belonging to the Director-General of the Civil Aviation Authority of Singapore.

Director-General
Civil Aviation Authority of Singapore

學員合影

