

TCAR OPS

TCAR OPS Air Operations Regulation and TCAR OPS Parts Public Consultation Report

APRIL 28

**The Civil Aviation Authority of Thailand
Authored by: Thapanapat Srimoonsang**

CAAT
สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand



Forewords

This report presents the outcome of the public consultation on the proposed TCAR OPS regulation conducted by the Civil Aviation Authority of Thailand (CAAT). The consultation was carried out with main Thai civil aviation stakeholders concerned on 20-21 April 2023.

The CAAT has been entrusted with the responsibility to regulate and supervise the safe, secure, and efficient operation of civil aviation in Thailand. This includes ensuring compliance with the International Civil Aviation Convention, ICAO Annexes, and International Standards.

“The CAAT's journey towards performance-based regulation: TCARs”

The primary objective of TCARs regulations is to establish and maintain a high and uniform level of civil aviation safety in the Kingdom of Thailand. In addition, TCARs regulations aim to contribute to the Thailand aviation safety policy, improve the overall performance of the civil aviation sector, and facilitate the mutual recognition of goods, persons, services, and capital. The regulations also aim to promote cost-efficiency, avoid duplication, and promote effectiveness in regulatory, certification, and oversight processes. Furthermore, TCARs regulations strive to promote the views of the Kingdom of Thailand regarding civil aviation standards and regulations worldwide and support passenger confidence in a safe civil aviation.

The transition to the TCAR OPS regulation is a crucial measure in achieving the aforementioned objectives.

The CAAT is grateful for the valuable input received during the public consultation process and will consider it during the finalisation of the regulation. The CAAT remains dedicated to ensuring the safety, security, and efficiency of Thailand's civil aviation industry while promoting its sustainable development.

Executive Summary

The TCAR OPS public consultation event was successfully completed, receiving positive feedback from all stakeholders, particularly the airlines who were the main target audience. This event marks a significant starting point for the implementation process of the new TCAR OPS regulation.

During the event, airlines and the Civil Aviation Authority of Thailand (CAAT) had the opportunity to exchange opinions, comments, and best practices for preparing to implement TCAR OPS. Thai Air Asia-X shared their best practices concerning the Fuel/Energy Scheme implementation based on TCAR OPS, and we express our gratitude for their contribution.

The event demonstrated CAAT's commitment to moving towards internationally recognised standards and enhancing aviation safety in the Kingdom of Thailand. The CAAT (OPS) department will continue to play a supportive and mentoring role for air operators during the transition period for successful implementation of TCAR OPS.

In summary, the TCAR OPS public consultation event was a successful opportunity for stakeholders to provide feedback, share best practices and demonstrating the industry's commitment to implementing TCAR OPS. Through this event, the CAAT (OPS) has shown its dedication to working alongside stakeholders to ensure a smooth transition to the new regulation. We are excited about implementing TCAR OPS and are committed to enhancing aviation safety in Thailand.

Acknowledgments

The successful TCAR OPS public consultation event, with a large audience, is a clear demonstration of the collective effort and dedication of the aviation industry next to the CAAT. I take this opportunity to express my sincere appreciation for the support and invaluable contribution of those who made the TCAR OPS initiative possible.

I would like to extend my gratitude to the following organisations and individuals:

- Our colleagues from CAAT-DGAC Cooperation team, Thibaut Lallemand (Project Director DGAC-France), Marie-Laure Toulouse (Project Director AIRBUS), Bernard Marcou (OPS Expert), and Jean-Michel Restout (Project Manager),
- Capt. Thasan Bureechana – Thai Air Asia-X,
- Khun Anan Tulyathan – Thai Vietjet Air,
- Khun Chayanun Benjasupatthanun – CAAT/OPS senior officer,
- Khun Warannapa Suthonmaythee – CAAT/SMO officer,
- Khun Silawan Songanusorn – CAAT/OPS officer, and
- Khun Suraset Chirawitthayakhun – CAAT/OPS officer.

Their expertise, guidance, commitment, and support in the aviation context have been instrumental in overcoming the complexities and challenges we encountered. The significant efforts they made in preparing, promoting the event and encouraging participation within the aviation community was highly appreciated.

I am honored, I had the opportunity to collaborate with such a dedicated team. Their hard work and commitment have made a real impact, and I am truly grateful for their support.

I look forward to working together again on future aviation safety initiatives.

Thapanapat Srimoonsang

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1. Introduction

1.1 Background

The Civil Aviation Authority of Thailand (CAAT) has made the decision to adopt a performance-based approach to safety regulation as a means of meeting global standards and reducing regulatory burden and inconsistencies within relevant regulations. This approach encompasses the use of "performance-based regulation: TCARs" and "Risk-based oversight" to ensure that safety measures are effectively implemented and monitored.

The TCAR OPS Air Operations Regulation and TCAR OPS Parts have been developed in compliance with ICAO Annex 6 - Operations of Aircraft (Part I, II, and III) and adapted from European Commission Regulation (EU) No. 965/2012 of 5 October 2012 - Air Operations¹ as amended.

In 2018 and 2019, the CAAT worked with other civil aviation organisations on establishing the TCARs, in particular with CAA International and the EASA.

During Covid breakout and with the support of the CAAT-DGAC (France) cooperation project team, the CAAT has been updating and refining the draft TCAR OPS to make it more suitable to Thailand's specific needs.

Some major elements that differ significantly from the current regulation (Air Operator Certificate Requirement: AOCR) include:

- Fuel/energy schemes;
- All-weather operations (AWOs) and flight crew training;
- Support programmes and psychological assessments for flight crew;
- Requirements for locating an aircraft in distress.

To address the challenges that may arise during the transition from the existing regulation to TCAR OPS, the CAAT has undertaken a Management of Change and Risk analysis.

¹ <https://www.easa.europa.eu/en/regulations/air-operations>

TCAR OPS considered the European regulation revisions until Commission Implementing Regulation (EU) 2023/203

As part of this process, we established a mitigation strategy that includes step by step transition as laid down in The TCAR OPS Air Operations (The OPS Cover regulation).

In line with this strategy, the CAAT has already conducted various activities since 2022, including:

- introductory sessions on TCAR OPS;
- internal training sessions for inspectors on TCAR OPS;
- workshops on the establishment of TCAR OPS compliant operations manuals;
- public consultations on TCAR OPS.

Some additional activities are already programmed as:

- individual mockup audits with major airlines;
- online trainings and webinars for air operators.

These measures were developed based on the outcome of the analysis and are aimed at facilitating a smooth transition to TCAR OPS.

1.2 Purpose

The primary aim of this report is to document the findings and suggested recommendations resulting from the TCAR OPS public consultation, organised by the CAAT on 20-21 April 2023. This report offers a comprehensive summary of the invaluable input obtained from a wide array of stakeholders during the consultation phase, including airlines, operators, industry associations, and the general public.

Moreover, the report identifies crucial areas of concern and presents well-substantiated recommendations to tackle these challenges, with the ultimate intention of enhancing the effectiveness and safety of air operations governed by TCAR OPS. Consequently, this report will serve as a robust basis for further discussions and decision-making processes pertaining to the implementation of TCAR OPS across the Kingdom of Thailand.

1.3 Scope

The report on the TCAR OPS regulation public consultation covers feedback and recommendations from the consultation process.

It starts with an introduction, describes the consultation process, and summarises the feedback received.

The report also analyses the feedback, identifies common themes or issues, and discusses changes made to the proposed regulation. In the final section of the report, key findings and recommendations for future actions are provided, and relevant appendices such as a list of stakeholders, relevant documentations, presentations and detailed survey results are included.

2. Overview of the Public Consultation Process

2.1 Overview

The TCAR OPS public consultation event represents a pivotal juncture in the process of introducing new regulations. This event was organised based on the outcomes of the management of change analysis and the action plan formulated to address the gaps identified during the preparation of the TCAR OPS publication in 2022.

The event comprised four principal agenda items, which included:

- An introduction and presentation of the high-level regulation and fundamental requirements;
- The implementation (transition) plan for TCAR OPS;
- A comprehensive overview of the significant changes induced by TCAR OPS entry into force; and
- A question and answer session, enabling stakeholders to offer their feedback.

Notably, this event marked the inaugural collaboration between the CAAT/OPS and a major airline, Thai Air Asia-X, to exchange best practices for preparing the implementation of TCAR OPS.

Thai Air Asia-X shared their experiences and practices pertaining to their fuel scheme (Basic fuel scheme with variation in accordance with CAT.OP.MPA.180, 181 & 182), specifically highlighting their 'fuel consumption and monitoring programme' utilising the AIRBUS Aircraft Performance Monitoring Programme and operations control function (flight monitoring).

This collaboration should be seen as a significant milestone for the aviation industry in Thailand as it demonstrates actual cooperation between the regulatory authority and the operators.

2.2 Schedule of the event

	Descriptions	Speaker
Day: 1	Presentation to High Level Regulation and Essential requirement	Veera Cheevaidarakul Acting Manger OPS
	TCAR OPS Transition & Implementation Plan (CAT Operators)	Thapanapat Srimoonsang OPS-Senior Officer
Day: 2	Preparation for TCAR OPS Implementation regarding the Fuel/Energy Scheme (Thai Air Asia-X)	Capt.Thasan Bureechana Chief Pilot Safety and Quality Flight Operations Department
	Highlight of Significant Changes in TCAR OPS (Part-ORO, Part-CAT, Part-SPA)	Thapanapat Srimoonsang OPS-Senior Officer
	Feedback, Q&A Session	Electronic Survey

The TCAR OPS public consultation event was conducted both on-site and via webinar. The total number of participants was 282 persons.

On-site attendance primarily comprised of existing airline representatives, along with new applicants in the AOC certification process and those undergoing the Air Operator License (AOL) application process.

2.3 Feedback collection

The electronic survey was introduced to collect the information and feedback.



3. Summary of Feedback Received

3.1 Pre-Event Survey

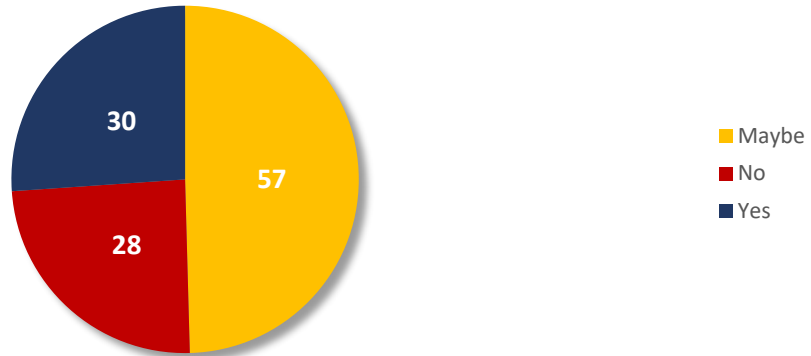
In anticipation of the event, a pre-event survey was implemented to systematically collect information regarding the attendees and the target audience. The overarching objectives of this endeavor were twofold:

- to discern the expectations; and
- perceptions of all participants in relation to the event, and to assess their comprehension of the TCAR OPS regulation and the accompanying transition plan.

Subsequently, a thorough analysis of the responses from 115 participants was conducted, yielding invaluable insights. The following sections delineate the outcomes derived from the pre-event survey, providing a comprehensive understanding of the participants' perspectives and knowledge on the aforementioned topics.



Are you familiar with TCAR OPS

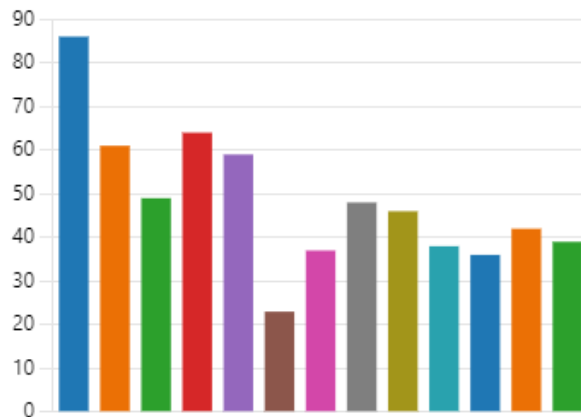


Would you concur that the implementation of TCAR OPS in Thailand has the potential to enhance aviation standards and alleviate Regulatory Burdens?



The most interested subjects or domains

- Transition Plan to TCAR OPS 86
- Organization requirement & Ma... 61
- AOC Application 49
- Operations Manual Requiremen... 64
- Flight Crew/Pilot Training Progr... 59
- Cabin Crew Training Programs 23
- Flight Operations Officer/Flight ... 37
- Flight & Duty Time Limitation : F... 48
- Operating Procedures (Flight & ... 46
- Aircraft Performance & Limitatio... 38
- Instrument, Data and Equipmen... 36
- Special Operations (eg RVSM, E... 42
- Airworthiness & Maintenance re... 39



The overview summary of the result from Pre-Event Survey:

The main audience of this event is the operating staff of airlines. Over 50% of the audience have recognised the TCAR OPS regulation will be valuable for Thailand, however they lack confidence in their understanding of it.

The most recurring topics are:

- the plan for the transition;
- the requirements for the operations manual;
- the organisational requirements; and
- the changes in the requirements for flight crew or pilot training programmes.

Most participants are confident that the TCAR OPS regulation can improve safety standards in the country. Additionally, they are confident that it will alleviate the “regulatory burden” in the existing system.

3.2 Questions and Feedback during the Event

The topics and issues that were brought up during the TCAR OPS Public consultation event have been grouped into three distinct domains. These are as follows:

- Feedback and comments were given on administrative requirements related to airline operations, including processes and procedures that could potentially impede or burden the industry (e.g. RCAB 97², the process for adding new aircraft to the fleet, etc.);
- Inquiries and requests were made for clarification regarding technical requirements (TCAR Parts, mainly flight crew training) and the transition strategy to TCAR OPS; and
- Concerns were expressed about the standardisation of CAAT inspectors' understanding and the internal coordination processes and procedures for implementing TCARs, particularly regarding the collaboration between OPS, PEL and AIR.

² <https://www.caat.or.th/th/archives/44403>

3.3 Feedback Survey (Post-Event)

The purpose of the feedback survey is to obtain insightful information that can be utilised to enhance the draft of the regulation and transition plan, as well as ensure that the needs and preferences of attendees are being addressed.

However, the survey received a limited response, with only 38 feedbacks from participants.

The primary focus of the survey questions was on several key aspects, including:

- the perception of the TCAR OPS regulation after the completion of the Public Consultation event;
- understanding of the regulation and transition strategy;
- appropriateness of facilities and logistics during the event;
- satisfaction with the content of presentations;
- participant's interests in specific topics or contents;
- complexity of relevant requirements to TCAR OPS; and
- any additional feedback or requests from the industry to support the implementation of TCAR OPS by CAAT.

The primary focus of CAAT has been on obtaining feedback for the "**improvement of the TCAR OPS Air Operations Regulation Project**". The feedback shared by participants has been intriguing, and some of the key points include in the details below:

No.	Descriptions	CAAT Actions
1	It is recommended that the CAAT consider the establishment of " additional guidelines " pertaining to the requirements outlined in TCAR OPS. These guidelines should provide explanations and examples on how to comply with or fulfill the requirements, such as a flight crew training programme and operations that require specific approval.	On process. (13 of additional guidelines are dedicated to FOI areas)
2	To ensure a seamless transition to TCAR OPS, the CAAT shall consider providing training or communication (" under the umbrella of safety promotion ") regarding the TCAR OPS regulation.	Mockup session has been planned and implemented to promote and support operators for transitioning to TCAR OPS.
3	The CAAT shall ensure the harmonisation of the OPS AIR and PEL regulation to avoid the inconsistency and regulatory burden .	TCARs (OPS AIR PEL) are based on the EU regulation, and a transition plan will be put in place to ensure a smooth transition.
4	The CAAT shall consider to provide training session or communication dedicated to the " Cabin Crew Training Programmes " related to the TCAR OPS requirement.	TBD
5	Regular communication and updates: Establish a 'TCAR Portal/ TCAR Transition Portal' and a direct communication channel between CAAT and the airline management team to ensure the timely exchange of information, address concerns, and obtain clarifications on the new regulations	TBD
6	Collaboration in risk assessment: Encourage collaboration between the airline industry and CAAT to conduct a comprehensive risk assessment, identifying potential challenges and areas of improvement during the transition period.	TBD

No.	Descriptions	CAAT Actions
7	Tailored implementation plan: Request support on developing a phased implementation plan tailored to each airline's specific needs, taking into consideration our current capabilities, resources, and requirements.	TBD
8	Technical support and expertise: Seek CAAT's assistance in providing technical support, including access to subject matter experts, tools, and resources, to help us understand and comply with the new regulations.	Mockup session has been planned and implemented to promote and support operators for transitioning to TCAR OPS.
9	Workshops and training sessions: Request CAAT to keep organising valuable workshops and training sessions (like previous sessions) for airlines.	The additional training sessions will be arranged to promote the understanding for each complicated domain.
10	Flexibility in compliance timelines: Encourage reasonable compliance timelines and flexibility, taking into account the unique challenges faced by our airline during the transition.	Article 13 of the Cover regulation allows operators flexibility on the timeframe for the transition, however the individual transition plan must be agreed upon with the CAAT
11	Benchmarking and best practices: Encourage CAAT to share case studies, best practices, and lessons learned from other airlines and regulatory bodies that have successfully transitioned to similar regulations	TBD
12	Post-implementation review: Request a post-implementation review process, where CAAT can evaluate each airline's compliance with the new regulations and provide feedback for further improvements that should not be counted as non-compliance affecting Risk Based Surveillance Performance Scores.	TBD

No.	Descriptions	CAAT Actions
13	<p>Continuous improvement and feedback mechanism: Establishment of a continuous improvement and feedback mechanism between CAAT and airlines, enabling airlines to periodically review and update our processes and systems in line with evolving regulations and industry best practices, that should be counted as transition feedback, not findings.</p>	TBD



4. Analysis of Feedback

4.1 Key Issues

The key issues identified during the pre-event survey and the event feedback can be grouped into the following categories:

- **Understanding of TCAR OPS and the Transition Plan:** The pre-event survey results indicate that many attendees lack confidence in their understanding of TCAR OPS and the transition plan. During the event, several participants raised questions and requested clarification on technical and administrative requirements.
- **Standardisation of CAAT Inspectors' Understanding:** Concerns were expressed about the standardisation of CAAT inspectors' understanding and the internal coordination processes and procedures for implementing TCARs, particularly regarding the collaboration between OPS, PEL, and AIR.
- **Harmonisation of Regulations:** Feedback and comments were given on administrative requirements related to airline operations, including processes and procedures that could potentially impede or burden the industry. Inquiries and requests were made for clarification regarding technical requirements (TCAR Parts, mainly flight crew training) and the transition strategy to TCAR OPS.
- **Communication and Training:** Many participants requested more communication and training from CAAT to ensure a seamless transition to TCAR OPS. Participants also recommended establishing a "Centralised System (e.g. Portal)" and a direct communication channel between CAAT and the airline management team to ensure the timely exchange of information, address concerns, and obtain clarifications on the new regulations. Additionally, several participants requested CAAT to provide training or communication dedicated to the "Cabin Crew Training Programmes" related to the TCAR OPS requirement.
- **Technical Support and Expertise:** Participants requested technical support and expertise from CAAT, including access to subject matter experts, tools, and resources, to help them understand and comply with the new regulations.

- **Flexibility in Compliance Timelines:** Participants encouraged reasonable compliance timelines and flexibility, taking into account the unique challenges faced by their airlines during the transition.
- **Continuous Improvement and Feedback Mechanism:** Several participants recommended establishing a continuous improvement and feedback mechanism between CAAT and airlines, enabling airlines to periodically review and update their processes and systems in line with evolving regulations and industry best practices.

4.2 Recommendations and Proposed Actions

Based on the key issues identified, the following recommendations are proposed:

- **Recommendation#1 Establish additional guidelines:** CAAT should consider the establishment of "additional guidelines" pertaining to the requirements outlined in TCAR OPS. These guidelines should provide explanations and examples on how to comply with or fulfill the requirements, such as a flight crew training programme and operations that require specific approval.

Proposed Action#1: The CAAT/OPS is currently working towards creating a "user guides", which will serve as supplementary guidelines to provide further clarity on how to demonstrate compliance with TCAR OPS. This initiative was initiated in 2022 and has received close support from DGAC-Expertise, specifically from Bernard Marcou. Additionally, the lists of user guide can be found in Appendix 3 §3.

- **Recommendation#2 Provide communication and training:** CAAT shall consider providing training or communication ("under the umbrella of safety promotion") regarding the TCAR OPS regulation to ensure a seamless transition to TCAR OPS. Participants also recommended establishing a "TCAR Portal/TCAR Transition Portal" and a direct communication channel between CAAT and the airline management team to ensure the timely exchange of information, address concerns, and obtain clarifications on the new regulations.

Proposed Action#2: Since 2022, the CAAT has been providing training on TCAR OPS, starting with internal training for inspectors and stakeholders. DGAC Expertise, specifically “Bernard Marcou” and “Jean Claude Marbec”, have provided support for this training initiative.

In 2023, mockup sessions were also conducted with eight major airlines to aid in their implementation and transition to TCAR OPS. This event also gave inspectors the opportunity to conduct on the job training (OJT) under TCAR OPS before its imminent implementation.

Recommendation#3 Ensure harmonisation of regulations: CAAT shall ensure the harmonisation of the OPS AIR and PEL regulation to avoid inconsistency and regulatory burden.

Proposed Action#3: The decision has been made by the CAAT to adopt the TCARs regulation, which is based on the (EU) Commission. This significant decision aims to promote the harmonisation of regulations related to flight operations, personnel licensing, and Airworthiness and Maintenance requirements.

Additionally, a transition plan has been developed for OPS and PEL to ensure a smooth and efficient implementation of TCARs. The coordination between the two plans is crucial to achieving this goal.

- **Recommendation#4 Provide technical support and expertise:** CAAT should provide technical support and expertise, including access to subject matter experts, tools, and resources, to help airlines understand and comply with the new regulations.

Proposed Action#4: The CAAT has developed a strategy to offer assistance for the training programme pertaining to TCAR OPS, with a special focus on complex areas including SPIs and SPTs aircraft performance and limitations, MEL, AOC critical approval, ground operations, and FTL. This aid will be administered through the assignment of championships (OPS inspectors) who will be responsible for each specific area.

Moreover, starting from 2023, certain training programmes or domains will benefit from the expertise of DGAC-France and AIRBUS.

- **Recommendation#5 Foster collaboration:** CAAT should encourage collaboration between the airline industry and CAAT to conduct a comprehensive risk assessment, identifying potential challenges and areas of improvement during the transition period. Additionally, CAAT should share case studies, best practices, and lessons learned from other airlines and regulatory bodies that have successfully transitioned to similar regulations.

Proposed Action: TBD

5. Conclusion

The public consultation event was successfully completed, receiving positive feedback from all stakeholders, especially the airlines, who were the main target audience. This event marks a great starting point for the implementation process of the new TCAR OPS regulation.

The event provided an opportunity for airlines and CAAT to exchange opinions, comments, and best practices for preparing to implement TCAR OPS. We renew our gratitude to Thai Air Asia-X for sharing their best practices concerning the Fuel/Energy Scheme implementation based on TCAR OPS.

This event demonstrated CAAT's commitment to moving forward to internationally recognised standards and enhancing aviation safety in the Kingdom of Thailand.

Additionally, CAAT OPS department will continue playing a supportive and mentoring role for air operators during the transition period for a successful implementation of TCAR OPS.

The issue of standardisation of the inspectors still exists, and air operators continue to perceive it as a challenge. We believe TCAR OPS will improve the situation due to the existence of numerous Acceptable Means of compliance and Guidance.

However, this remains an objective for CAAT OPS department to gain industry confidence, as we move forward together.

Appendix 1: List of Stakeholders

On-Site Participant

CAAT Representatives:

No.	Name	Organisation
1	Veera Cheevaidssarakul	CAAT/OPS (Manager)
2	Kajopat Maklin	CAAT/SMO (Manager)
3	Paisit Herabat	CAAT/AIR (Manager)
4	Mr. Andrew Gordon Chumney	CAAT/AIR (Expert)
5	Capt.Athisak Padchuenjai	CAAT/OPS
6	Capt.Supamit Songpaisan	CAAT/OPS (Expert)
7	Jiroj Wuttiplakorn	CAAT/OPS
8	Barom Vichitranuj	CAAT/OPS
9	Apiwat Torpradit	CAAT/OPS
10	Pawin Techawiboonwong	CAAT/OPS
11	Chalatthasorn Siripatt	CAAT/OPS
12	Wannakorn Vutiwatana	CAAT/OPS
13	Arthit Sumon	CAAT/OPS
14	Varanya Lertvanangkul	CAAT/OPS
15	Suwinya Vanintaradul	CAAT/OPS
16	Waritha Kulkusol	CAAT/OPS
17	Chanathorn Horata	CAAT/OPS
18	Sutas Srichan	CAAT/OPS
19	Itsara Habangkam	CAAT/OPS
20	Sukanan Chantharasiri	CAAT/OPS
21	Silawan Songanusorn	CAAT/OPS
22	Suraset Chirawitthayakhun	CAAT/OPS

23	Narongdesh Srisaeng	CAAT/OPS
24	Jureeporn Supaprasert	CAAT/OPS
25	Natt Sillaparusmee	CAAT/OPS
26	Aroon Sanguanthamarong	CAAT/OPS
27	Jakkraphong Saraphak	CAAT/OPS
28	Suphakit Riengsuwan	CAAT/OPS
29	Piroj Lertpanyapornskul	CAAT/OPS
30	Katwadee Meeubon	CAAT/OPS
31	Preeyanuch Termsup	CAAT/OPS
32	Karnicha Swasdikiet	CAAT/LEG
33	Kirana Sooksawat	CAAT/LEG
34	Pongsapol Suwanlertcharoen	CAAT/LEG
35	Thanesuan Pansamud	CAAT/LEG
36	Pannatat Chalesombut	CAAT/AIR
37	Athijit Khantharat	CAAT/AIR
38	Tippol Sroysiri	CAAT/AIR
39	Warannapa Suthonmaythee	CAAT/SMO
40	Thapanapat Srimoonsang	CAAT/OPS

Air Operator Representatives:

1	Capt.Nontaporn Mandachitra	Bangkok Airways
2	Khun Phathaiphong Inthasotthi	Bangkok Airways
3	Capt.Chalermrit Saisakulsri	Thai Airasia
4	Capt.Khoonlor Pornsirirat	Thai Airasia
5	Capt.Naroupon Chandrakulsiri	Thai Airways
6	Capt.Narathip Lucksanar	Thai Airways
7	Capt.Thasan Bureechana	Thai Airasia X
8	Khun Jeerasuda Sundod	Thai Airasia X

9	Capt.Kittiphong Phonpraphat	Nok Airlines
10	Capt.Promptun Sangkeaw	Nok Airlines
11	Khun Visaru Rakmunusa	Thai Smile Airways
12	Khun Tosapol Sukto	Thai Smile Airways
13	Capt.Manit Jiamram	Thai Lion Mentari
14	Capt.Cholyut Sungkanun	Thai Lion Mentari
15	Khun Jaiyavat Navaraj	Mjets
16	Khun Thotsaporn Charoensup	Mjets
17	Capt.Chanut Jitbunjong	K-Mile Air
18	Khun Pattaraporn Jantaramee	K-Mile Air
19	Khun Baramee Kasemsan Na Ayudhaya	Thai Viet Jet Air
20	Capt.Itthichai Lasunon	Thai Viet Jet Air
21	Capt.Palang Khamleg	AC Aviation
22	Capt.Phrompratan Sorassa	AC Aviation
23	Capt.Petr Spacek	VIP Jets
24	Khun Natthakan Sriyotha	VIP Jets
25	Khun Suwichaya Thanapaisankij	Siam Land Flying
26	Khun Athakorn Charumanee	Siam Land Flying
27	Capt.Warin Nilapornkul	Siam Land Flying
28	Khun Nathapong Thitapas	Advance Aviation Jet
29	Khun Dissaya Kittimanant	Advance Aviation Jet
30	Khun Thayagiat Chanarat	United Offshore Aviation
31	Khun Amarin Teanprayoon	United Offshore Aviation
32	Khun Sarawut Muakklan	H.S. Aviation
33	Khun Poradon Jittharak	H.S. Aviation
34	Khun Wanchai Kunawaradisai	SFS Aviation
35	Khun Suwan Bhuteng	Thai Aviation Services
36	Khun Waranglak Prayoonwong	Thai Aviation Services

37	Khun Phayon Ruangsuwan	Bangkok Helicopter Services
38	Khun Decha Likhitchokthananont	Bangkok Helicopter Services
39	Khun Surapong Pholprasit	Advance Aviation
40	Khun Tachakorn Phukesorn	Advance Aviation
41	Khun Thanabool Kerdkul	Thai Summer Airways
42	Khun Taninchai Puttichon	Thai Summer Airways
43	Khun Wattanaphon Intarasiritorn	Budget Lines
44	Khun Rossatorn Siripatt	Budget Lines
45	Capt.Akasit Dounghmaln	Thai Flying Service
46	Khun Chanchai Kanankhang	Thai Flying Service
47	Khun Suttimas Sangmas	Asian Aerospace Services
48	Capt.Decha Kuptapun	Asian Aerospace Services
49	Capt.Prayoot Trakoolpat	P80AIR
50	Narin Thoenburin	P80AIR
51	Khun Sirinat Suteethorn	Siam Sea Plane
52	Khun Vithawat Thurdnampetch	Siam Sea Plane

Appendix 2: Public Consultation Presentations

The resources regarding the TCAR OPS Public consultation event are uploaded into the CAAT website as follows:

- <https://www.caat.or.th/th/archives/71638>
- <https://www.caat.or.th/wp-content/uploads/2023/02/Draft-TCAR-Regulation-and-associated-AMCs-GMs.rar>
- <https://www.caat.or.th/wp-content/uploads/2023/02/Material-for-TCAR-OPS-Public-consultation.rar>
- <https://www.caat.or.th/wp-content/uploads/2023/02/TCAR-OPS-Training-material.rar>

Appendix 3: Management of Changes

1. Introduction to the methodology

According to the recommendations outlined in ICAO DOC 9859 - Safety Management Manual³, Safety Assurance is a crucial element that involves managing the "Management of Change" process. As part of this process, OPS has recognised that changes to the TCAR OPS regulation require focused analysis and appropriate mitigation measures to control the associated risks within acceptable levels in an efficient manner.

To assess the risks associated with the implementation of TCAR OPS regulation, a Bow Tie⁴ analysis was conducted. This analysis identified the top events, threats, consequences, barriers, and escalation factors, as outlined in this appendix.

Based on the analysis, several measurement strategies, including action plans, were developed. The most critical of these strategies relates to the TCAR OP Training Programmes for stakeholders (e.g. OPS&PEL inspectors, compliance managers, operator representatives, etc.) and outlines the communication and transition plan to TCAR OPS.

2. Risk Assessment

the Risk Assessment consists of the three (3) major elements:

- Hazard identification;
- Risk assessment; and
- Risk mitigation.

Hazard identification is about collecting and analysing operational safety data, thereby identifying safety issues. Such safety data typically includes safety reports, occurrence reports, flight data events, and the results of safety surveys and audits. Hazard identification provides the basis for a risk assessment.

³ <https://www.icao.int/safety/SafetyManagement/Pages/GuidanceMaterial.aspx>

⁴ <https://www.caa.co.uk/safety-initiatives-and-resources/working-with-industry/bowtie/about-bowtie/introduction-to-bowtie/>

The risk assessment itself identifies and classifies the safety issues and threats. Safety risk is the projected likelihood and severity of the consequence or outcome from an existing hazard or threat.

The risk mitigation process alleviates the safety issues to an acceptable level.

3. Bow tie Method

BowTie diagrams are a simple and effective tool for communicating risk assessment results. The diagrams clearly display the links between the potential causes, preventive and mitigative controls and consequences of a major incident. BowTie diagrams may be used to display the results of various types of risk assessments.

The general structure of a BowTie diagram is represented in the diagram below:

Analysis

The analysis was conducted using the following steps:

- Step 1: Identify the hazard
- Step 2: Determining the Top Event and the Associated Threats
- Step 3: Identifying the Relevant Safety Issues Leading to a Threat
- Step 4: Classifying the Safety Issues
- Step 5: Threat analysis and mitigation measures

Hazard

The new TCAR OPS regulation and TCAR OPS Parts are classified as hazards for this analysis.

Tops Event and Associated Threats

- **Top Event:** The operators are unable to fully comply with the applicable requirements (e.g. ORO.FTL, Part-CAT, Part-SPA, Part-NCC, Part-SPO.)
- **Threats string 1: Lack of knowledge**

Description

The threat associated with the implementation of a new regulation is the lack of readiness and knowledge among air operators and OPS inspectors. This can lead to potential safety risks as well as non-compliance with the new regulation. Operators and inspectors may not be fully prepared to understand the

requirements and implications of the new regulation, which could lead to confusion and errors in implementation. Additionally, lack of knowledge could result in non-compliance with the regulation, which could lead to penalties and potential damage to the reputation of the organisation. Therefore, it is important to provide “adequate training and education” to ensure that all stakeholders are well-informed and prepared for the implementation of the new regulation.

Proposed mitigations:

- TCAR OPS introductory session to OPS Inspector, has been arranged for January 2022;
- TCAR OPS introductory session to Air Operators, has been arranged for June 2022;
- Operations Manual establishment and Gap analysis for OPS inspector taken place in August 2022:
 - Operations Manual Part-A;
 - Minimum Equipment List (MEL).
- Operations Manual establishment and Gap analysis for OPS inspector taken place in August 2022
 - Operations Manual Part-A.
- TCAR OPS Public consultation & public hearing; and
- Additional training programmes should be implemented for inspectors and air operators to address the gaps identified during the transition.

● **Threat string 2: Misinterpretation**

Description

The threat associated with possible misinterpretation of information contained in new regulations due to a lack of knowledge is significant. Misinterpretation can lead to non-compliance, resulting in fines, legal action, or damage to a company's reputation. It is essential to have a clear understanding of the new regulations and to ensure that all personnel impacted by them are educated and trained appropriately. Failure to do so could have serious consequences for the organisation. Therefore, “investing time” and resources to “understand new regulations” and ensure that all stakeholders are adequately informed is crucial.

Proposed mitigation:

- TCAR OPS Compliance Matrix (tools);

- Operations Manual Assessment Matrix (tools);
- Assessment and Audit checklist (tools).
- TCAR OPS Mockup Session with 8 major Airline (March – December, 2023).
- **Threat string 3: Mixture of requirement**

Description

This threat string considers the risk resulting from a mixture of old and new regulation. As the complete transition from old to new requirement takes approximately three (3) years for CAT operator, a mixture of requirement may occur in this period.

Proposed mitigation:

- User guides on how to comply with TCAR OPS requirements have been established as follows:
 - Guideline for FC training programme - aeoplane;
 - Guideline for MEL;
 - Guideline for RNP AR APCH;
 - Guideline for PBN Operations;
 - Guideline for RVSM;
 - Guideline for ETOPs operations;
 - Guideline for MNPS or NAT-HLA;
 - Guideline for EFBs;
 - Guideline for Fuel Scheme;
 - Guideline for individual FTL scheme;
 - Guideline for 2D and 3D approach operations; and
 - Guideline for Operational C.G. envelope.

Note: *the additional guidelines such as AWOs and operational credits, SET-IMC, FANS, FRMS, CC training programmes and etc. will be established ASAP.*

- **Threat string 4: Lap of implementation of the related requirement**

This threat refers to a situation where a requirement or a set of requirements are not properly implemented, which can lead to errors, safety vulnerabilities, and other issues. The lack of implementation of a related requirement can occur due

to a variety of reasons, such as lack of understanding, limited resources, miscommunication.

To mitigate this threat, it is important to have a clear understanding of all the requirements and ensure that they are properly documented. The project team should have a thorough understanding of the requirements and ensure that they are implemented according to the project plan.

Finally, it is important to have open and transparent communication channels between the project team and stakeholders to ensure that all requirements are properly understood and implemented. This can help to avoid misunderstandings and ensure that the final system meets the needs of all stakeholders.

Proposed mitigation:

- Meeting and coordination plan between OPS AIR PEL (TBD).

The Bow-Tie method depicted above illustrates the threats and control measures designed to prevent a "Top Event" from occurring. However, in the recovery phase, the consequences are identified as follows:

- **Consequence 1: Certification, authorisation and approval above timeline**

Description

This consequence pertains to the potential delay in the CAAT's certification and approval process, which may occur post the top event. This could lead to a cessation of operations in the industry since operations require certification. Such a scenario could prove detrimental to the Thai aviation industry's economy. Therefore, it is crucial to prioritise expediting the CAAT's certification and approval process to avoid any possible delay.

Proposed mitigation:

- Establishment of the oversight programme.
 - Conduct the oversight according to the programme and plan.
 - Monitoring the plan through the oversight tracking system.
- **Consequence 2: Unable to achieve the ICAO EI score⁵.**

⁵ <https://www.icao.int/safety/pages/usoap-results.aspx>

Description

This consequence pertains to a scenario where stakeholders are unable to comply fully with the applicable requirement (TCAR OPS), highlighting the CAAT's ineffectiveness in implementing the requirement. If there is no recovery measure in place to mitigate this impact, Thailand's Effectiveness Implementation (EI) score will likely decrease or fail to achieve the intended target. It is crucial to take proactive measures to ensure full compliance with TCAR OPS requirements to prevent such a situation from occurring.

Proposed mitigation:

- Establishment of the oversight programme.
- Conduct the oversight according to the programme and plan.

BowTie Overview Diagram

