AERONAUTICAL RADIO OF THAILAND

Annual Report 2020

AERONAUTICAL RADIO OF THAILAND LTD.

Content

“As the national Air Navigation Services provider, the Company adheres to its commitment to carry out its missions according to its vision ‘A Sustainable Quality Excellent Air Navigation Services Provider’”

Air Chief Marshal (Siwakiat Jayema)
Chairman of the Board of Directors

Message from the Chairman

Due to the outbreak of Corona Virus Disease (COVID-19) pandemic, aviation industry has been severely affected causing a great reduction of flight volume since January 2020. The Government has issued emergency measures to prevent and stop the outbreak of COVID-19. Emergency decrees have been announced for all areas throughout the Country since March 2020 and have been extended to January 2021. The Civil Aviation Authority of Thailand has made several announcements regarding flight operations causing a temporary suspension of all domestic and international flights, resulting in many airlines having to reduce their flights or cease operations. it also affected many businesses both directly or indirectly including air trasportation business. Many countries have imposed restrictions on travelling. The Company has inevitably been affected by the reduction of number of flights on top of the measures imposed by the Government to assist airlines by reducing the flight charges causing the decrease of income resulting in income-under-expenditure which has never occurred to the Company.

In the fiscal year 2020, the traffic volume that the Company provided services declined by 41% and the forecast for 2021 shows that the impact will continue to affect the Company. However, it is expected that the situation will get better with the support from the Government's policy to assist business operators and airlines.

The Company tried to lessen the impact by reducing expenditure and managing income to use for working capital. A financial contingency plan was drafted to sustain the Company through this crisis. The Company has implemented an overall non-safety related expenditures reduction and set a tight budgeting framework as well as adjusted cost structure to be in line with the situation without affecting the standards and safety of services.

As the national Air Navigation Services provider, the Company adheres to its commitment to carry out its missions according to its vision "A Sustainable Quality Excellent Air Navigation Services Provider" including management which emphasizes quality building for air navigation services and other related services as assigned. This will create balance of sustainable economic, social and environmental development and corporate social and environmental responsibilities of the Company under the Board of Directors' good corporate governance.

On behalf of the Board of Directors, I can assure all shareholders, users and stakeholders that the Company will continue to strive and improve the services with safety, standards and efficiency for the benefits of the shareholders and stakeholders.

“to be proactive HR professionals in providing appropriate and cost-effective human capital management with the aim to help AEROTHAI attain higher efficiency and sustainable growth”

(Mr. Somnuk Rongthong)
President

Message from the President

Currently, the Company is facing a challenging situation that it has to deal with Corona Virus Disease (COVID-19) pandemic outbreak. There has been a New Normal way of life. In the fiscal year 2020, the total number of flights was 616,905 flights, decrease of 41% from the previous year. The Company has implemented an overall expenditures reduction to manage costs and expenditures to be in line with the situation. Any expenditure that had no impact on the provision of air navigation services were reduced. Implementations that did not affect safety sector were postponed or cancelled. Budget spending was tightly controlled by adjusting the implementation to suit the situation. Personnel expenditures were reduced by administering manpower according to the flight volume. Long-term manpower managerment has been planned and cost structure was adjusted to be in line with the situation and reduce employee expenditures in the long run.

In the fiscal year 2020, ther were satisfactory major progress and implementations as follows:

1. AEROTHAI has commissioned the new air traffic control system (Thailand Modernization CNS/ATM System: TMCS) at Regional Air Traffic Control Centre, Regional Approach Air Traffic Control Centre, Bangkok Terminal Air Traffic Control Centre, Air Traffic Control Towers throughout the Country and the last place, the Bangkok Area Control Centre was opened in February 2020.
2. AEROTHAI has implemented Business Continuity Management (BCM) under the Business Continuity Management (BCM) Project with the aim to achieve the ISO 22301:2012 standards. In the fiscal year 2019, AEROTHAI successfully received the ISO 22301:2012 certificate for the three central ATC Centres (Tung Mahamek, Don Mueang, Suvarnabhumi) under the scope of Air Traffic Services (ATS) and Aeronautical Information Services (AIS). In the fiscal year 2020, AEROTHAI continued to maintain the BCM system standards.
3. The Company developed AEROTHAI HR Master Plan for the years 2021-2025, which indicated a clear direction for HR units going forward. The HR vision is “to be procative HR professionals in providing appropriate and cost-effective human capital management with the aim to help AEROTHAI attain higher efficiency and sustainable growth”. Additionally, AEROTHAI has developed its HR management in many dimensions and drafted a 10-year manpower plan (2021-2030) as a framework for the future changes of environments and air navigation services context. AEROTHAI installed SAP Human Resource Information System (SAP-HRIS) to support HR management for maximum efficiency.
4. The Company has been evaluated in accordance with State Enterprise Performance Appraisal by the State Enterprise Policy Office (SEPO). This was the tool to increase the competitiveness of state enterprises and create value added to state’s property for the sustainable development. The assessment result of 2019 was 4.4319 points (total of 5 points) which was almost the same as that of the previous year of 4.5862 points.
5. Regarding the integrity and trasparency assessment for the Company’s operations, the Company has established the system of integrity and transparency publication on internal and external AEROTHAI website completely. This will sustainable drive the integrity and transparency assessment of the Company’s performance with strict adherence to international standard of good corparate governance in order to create sustainable value to air navigation services and aviation systems including national interests.

6. The Company has set digital technology policy and drafted digital operating plan as the Master Plan for concrete implementation in the form of projects/digital development by using digital technology to respond to the Government's policies and guidelines as well as developing the Company according to the criteria of State Enterprises Assessment Model (SE=AM).
7. The Company's credit rating by TRIS Rating Co., Ltd. was at the level of "AAA" with the "Stable" outlook which reflects the status of the Company as a government-related entity (GRE), and its important role to the government as the main provider of air navigation services in the Country.
8. The Company received innovation award in the IT Technology and Communication Science Category from the National Research Council of Thailand and silver medal for Basic Electronic Circuitry and special prize (gold medal) from the Ministry of Science and Higher Education of the Russian Federation at the International Trade Fair-ideas, Inventions and New Products (iENA 2019), Nuremberg, Federal Republic of Germany.

I wish to thank all shareholders, users and stakeholders who have always given support to the Company's operations and thank the employees and management for their determination, dedication and cooperation to overcome the obstacles and crisis. I hope that we will get through these obstacles soon and thank the shareholders and related parties for their continuous cooperation and support.

Corporate Information

Company's Background

After the First World War, the Post and Telegraph Department had been assigned by the Royal Thai Government to assume responsibility of providing Air Traffic Control and Aeronautical Communications to international aircraft passing over and landing in Thailand. These ceased with the expansion of the Second World War to Asia which prevented commercial aircraft taking to the sky. When the Second World War ended, international civil aviation resumed. On 15 April 1948, Aeronautical Radio Inc. (ARINC) of the United States of America, International Aeradio Ltd. (IAL) of the United Kingdom and various airlines operating services to Thailand jointly founded Aeronautical Radio of Siam Limited. (AEROSIAM) with the consent of the Royal Thai Government to provide Air Traffic Control services and Aeronautical Communications services in accordance with ICAO's standards and recommended practices.

Later the Thai Government recognized its capability and the importance of the Company's responsibility concerning national security and aviation development. Therefore, the Government acquired a majority of the share capital from the founding airlines and changed its name to Aeronautical Radio of Thailand Limited (AEROTHAI) on 1 November 1963.

International airlines operating services to Thailand were also welcomed as shareholders. The Company's status has since become a state enterprise under the Ministry of Transport, operating as a limited company. The Company operates on behalf of the Government as a non-profit organization to provide safety services which are Air Traffic Control and Aeronautical Telecommunications services in the Bangkok Flight Information Region (FIR) with the network linking with other countries. In addition, there is a business sector which provides aviation related services both domestic and overseas.

Vision

"A Sustainable Quality Excellent Air Navigation Services Provider"

(Vision for AEROTHAI development and operations in the strategic framework for 2020-2024.)

Mission

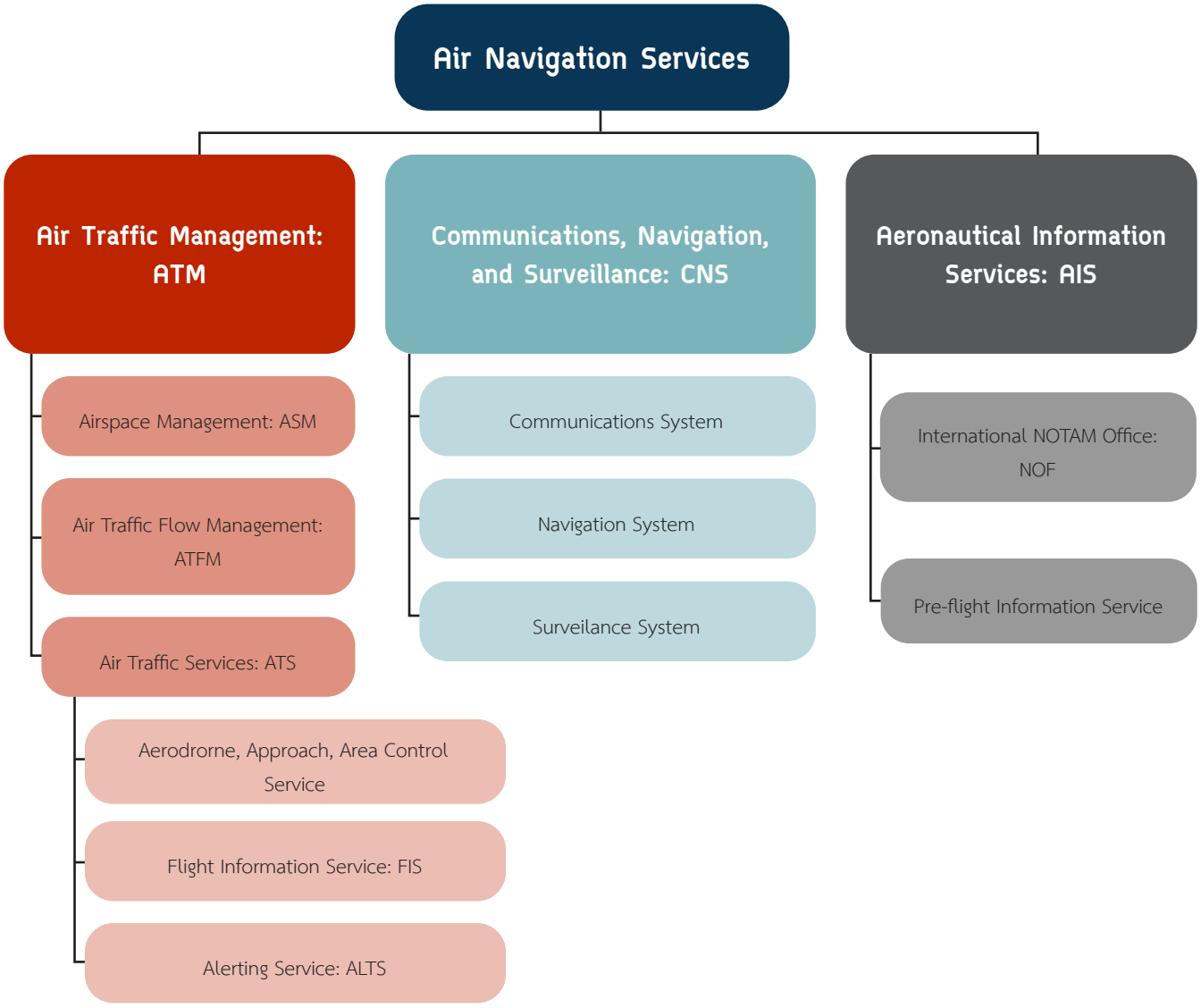
"To be the national air navigation services provider that meets users' requirements in safety, standards, and efficiency in order to create value to the national aviation systems and interests."

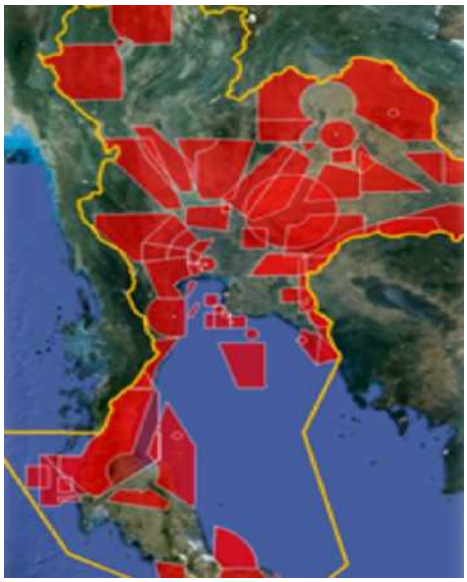
Role and Responsibilities

AEROTHAI is responsible for Air Navigation Services for flight operations within Thailand in 3 parts as follows:

- Air Traffic Management (ATM)
- Communications, Navigation, and Surveillance (CNS)
- Aeronautical Information Service (AIS)

Air Navigation Services under AEROTHAI's Responsibility.





Airspace Usage Proportion between Civil Sector and Military Sector (shown in red) within Bangkok FIR.

Air Traffic Management (ATM)

To support flight operations within Thailand's area of responsibility, AEROTHAI provides the following Air Traffic Management (ATM) services:

a. Airspace Management (ASM)

Considering the current circumstance where airspace within Bangkok Flight Information Region (Bangkok FIR) is divided for use by civil and military sectors at around 50% each, AEROTHAI puts Airspace Management (ASM) Service in its operations with the objective to utilize airspace, a limited resource, to the greatest extent possible, so that the missions of both civil airspace users and the military sector can be efficiently achieved. In this regards, the classification of airspace specified for military missions, which may pose potential hazards to other flight operations, is also adopted for a safety reason.

b. Air Traffic Flow Management (ATFM)

Apart from ASM, AEROTHAI also provides Air Traffic Flow Management (ATFM) Service to balance the foreseen air traffic demand and available capacity in the case where airspace and/or airport are constrained. It has been observed that, with ATFM in place, not only the level of flight safety is enhanced but also the operational efficiency, especially predictability, is increased.

c. Air Traffic Services (ATS)

With the ultimate goal to ensure the safe operations of aircraft and expedite as well as maintain an orderly flow of air traffic within Bangkok FIR, AEROTHAI has been offering Air Traffic Services (ATS), its major services since founding, with the scope as follows:

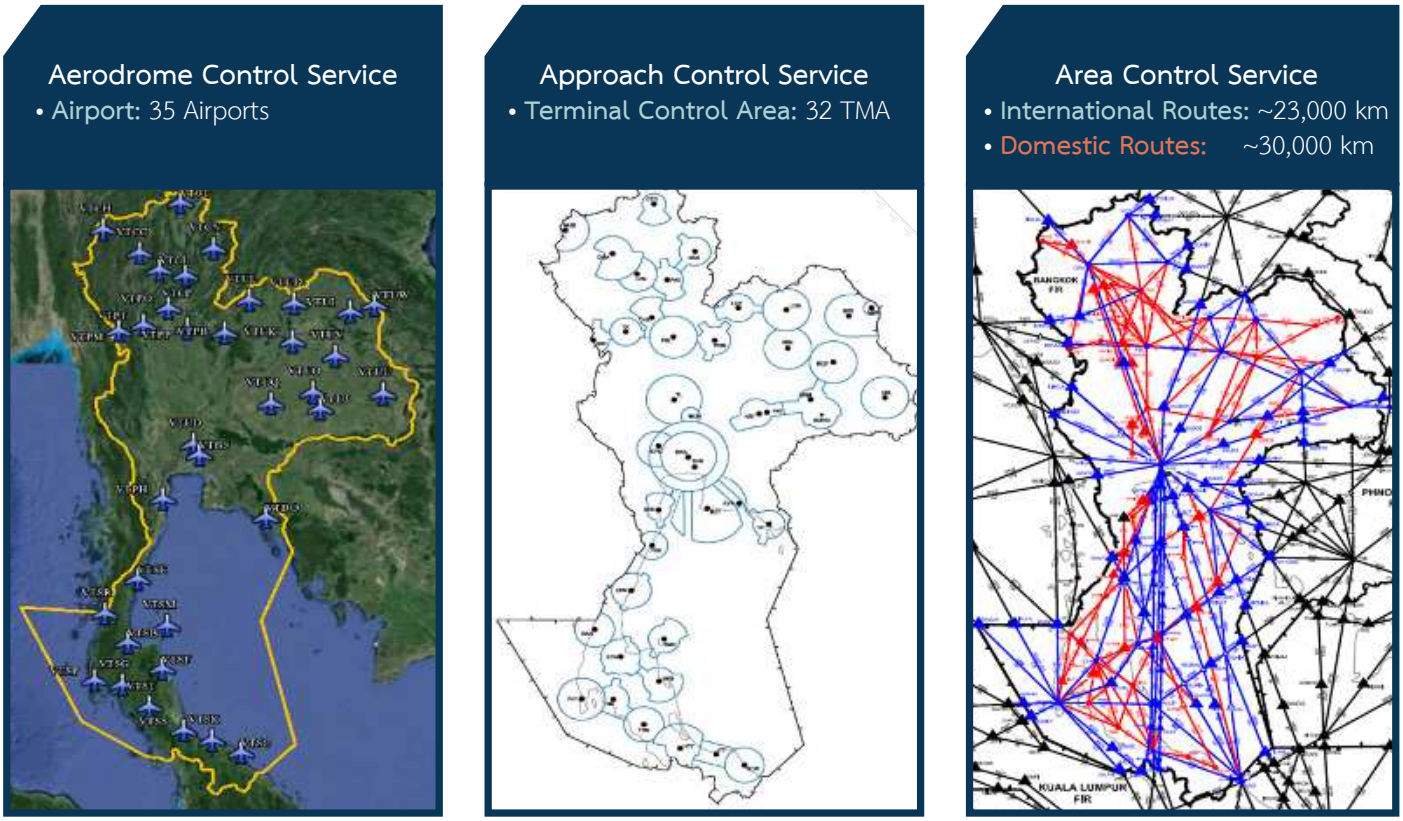
(1) Air Traffic Control Service (ATCS)

ATCS, which is provided by AEROTHAI and covers the whole Bangkok FIR, is divided by service scopes into three parts, namely,

- Aerodrome Control Service is provided to flights arriving at/departing from the aerodrome and operating within about 5 NM around the aerodrome;
- Approach Control Service is provided to flights approaching/departing from the aerodrome and operating within about 50 NM around the aerodrome; and
- Area Control Service is provided to flights operating in controlled areas and on ATS routes within Bangkok FIR.

(2) Flight Information Service (FIS)

(3) Alerting Services (ALTS)



Air Traffic Control Services provided by AEROTHAI.

Communications, Navigation, and Surveillance (CNS)

AEROTHAI provides Communications, Navigation and Surveillance Systems to support the ATM service provision in order to enable air traffic controllers to communicate with airspace users and to determine the position and direction of the aircraft under control. The short summary of CNS services provided is as follows:

a. Communications Systems

The Communications Systems are provided for real-time communications between air traffic controllers and related parties. Currently, the Communications Systems provided can be divided into 2 categories as follows:

- Ground-to-ground Communications:
  The services are provided for communications between air traffic controllers and related units both domestic and international.
- Air-to-ground Communications:
  The services are provided for communications between air traffic controllers and airspace users.

The Communications System services provided by AEROTHAI cover the entire aerodrome, approach and area control within Bangkok FIR.

b. Navigation Systems

AEROTHAI provides Navigation Systems services to navigate aircraft on en-route and landing/departing at/from aerodromes so that the airspace users will know their accurate and precise positions. There are different types of services depending on the serviced areas.

c. Surveillance Systems

AEROTHAI provides Surveillance Systems services to track the current position of aircraft so that air traffic controllers can monitor aircraft under his/her controlled sectors both area and approach controls within Bangkok FIR and also for ground control at aerodromes with heavy air traffic. AEROTHAI currently offers 4 types of services using various surveillance technologies, which are (i) Primary Surveillance Radar (PSR), (ii) Secondary Surveillance Radar (SSR), (iii) Multilateration (MLAT), and (iv) Surface Movement Radar (SMR)

Furthermore, in order to raise the safety level for the ATM services, AEROTHAI has put many automation systems into operation, such as ATM Automation System which can assess/alert safety, Flight Data Processing System (FDPS) which can process flight data for air traffic controllers to make decision, etc.

Aeronautical Information Service (AIS)

Currently, AEROTHAI is responsible for the provision of Aeronautical Information Service (AIS) by acting as the International Notice to Airmen (NOTAM) Office (NOF) to ensure safe and efficient flight operations and Air Traffic Management within Bangkok FIR and overseas. Apart from acting as NOF, AEROTHAI also provides Pre-flight Information Service to airspace users to help them in their flight preparation.

In addition, AEROTHAI has been assigned by ICAO to be the Regional OPMET Center (ROC) and the Regional OPMET Data Bank (RODB) for Asia/Pacific.

Other Related Services

AEROTHAI has carried out research and development of equipment and services to provide related services to fulfill the requirements of airlines and air transport operators as well as in-house use instead of importing from overseas by utilizing the knowledge, expertise and experiences of its personnel for the maximum benefit.

Corporate Plan

Under the vision "A Sustainable Quality Excellent Air Navigation Service Provider" which focusses on maintaining standards and improving quality of services to be comparable to the best practices, AEROTHAI's strategic issues and objective in the period between 2020-2024 are as follows:

Strategic Issue	Strategic Objective
1. Providing Safe and Efficient Air Navigation Services	1. To provide safe and secured services in all phases of flights. 2. To increase capacity for future demand and upgrade efficiency of air navigation systems.
2. Developing Employees Professionalism	3. To have sufficient number of professional personnel and to systematically manage human resource to achieve Company's vision and sustainable growth. 4. To have dedicated personnel with attachment and good personnel environment.
3. Becoming High Performance Organization (HPO)	5. To have good corporate performance throughout the organization and to be ready for changes so that the result will be sustainable efficiency and satisfaction of all groups of stakeholders and users. 6. To adhere to Good Corporate Governance practices and strive for best-in-class management. 7. To be an organization of innovation on the digital technology basis. 8. To maintain air navigation charges that are fair, transparent, and competitive through efficient management of organizational budget and finance.
4. Improving National Competitiveness and Creating Value for the Aviation Industry	9. To create value for all levels of the aviation industry. 10. To have the complete Air Navigation Service Infrastructure with the capacity in line with the development of the Country's air transportation.

Company's Services

AEROTHAI is a state enterprise under the Ministry of Transport. The Ministry of Transport assigned AEROTHAI to provide air navigation services including air traffic control service, aeronautical communication service, and other related service. AEROTHAI provides safe and efficient services according to Standards and Recommended Practices (SARPs) recommended by the International Civil Aviation Organization (ICAO). Under the contract with Ministry of Transport, AEROTHAI agrees to serve all users without making profit, and receive the service fees through the air navigation service charges paid by the users in a fair manner.

Location and Website

AEROTHAI Head Office

102 Soi Ngamduplee, Tungmahamek, Sathon,
Bangkok 10120 Thailand
Tel : 0 2287 3531-41 Fax : 0 2287 3131
Website : www.aerothai.co.th

Hat Yai Air Traffic Control Centre

100 Moo 3, Sanambin Road,
Klong La Sub-district, Klong Hoi Kong District,
Songkhla 90115
Tel : 0 7425 1051-60 Fax : 0 7425 1339

Phuket Air Traffic Control Centre

200 Khao Bo Sai, Maikhaow Sub-district,
Thalang District, Phuket 83110
Tel : 0 7632 7251-5 Fax : 0 7632 7258-9

Surat Thani Air Traffic Control Centre

Surat Thani Airport, Huateuy Sub-district,
Phunphin District, Surat Thani 84130
Tel : 0 7744 1132 Fax : 0 7744 1133

Chiang Mai Air Traffic Control Centre

60 Sanambin Road, Suthep Sub-district,
Mueang District, Chiang Mai 50200
Tel : 0 5327 0624-32 Fax : 0 5327 7600

Phitsanulok Air Traffic Control Centre

Sanambin Road, Arunyik Sub-district,
Mueang District, Phitsanulok 65000
Tel : 0 5530 1422 Fax : 0 5530 1450

Nakhon Ratchasima Air Traffic Service Engineering Operating Centre

Baan Piman, Tha Chang Sub-district,
Chalermprakiat District, Nakhon Ratchasima 30230
Tel : 0 4425 7670 Fax : 0 4425 6576

Udon Thani Air Traffic Control Centre

Mak Khaeng Sub-district,
Mueang District, Udon Thani 41000
Tel : 0 4224 6803 Fax : 0 4224 9734

Ubon Ratchathani Air Traffic Control Centre

Thepyotee Road, Naimueng Sub-district,
Mueang District, Ubon Ratchathani 34000
Tel : 0 4524 0798 Fax : 0 4524 0798

Hua Hin Air Traffic Control Center

Mooban Bofai, Hua Hin Sub-district, Hua Hin District,
Prachuap Khiri Khan 77110
Tel : 0 3252 0831 Fax : 0 3252 0833

Summary of the Financial Reports

	2020	2019	2018
Operating Performance (Baht: Million) [1/]			
Total Income	7,376.45	13,347.32	13,115.85
Total Expenditure	10,802.98	12,498.96	10,757.41
Overcollection to be refunded to Member Airlines	(3,426.53)	848.36	2,358.44
Remark [1/] Separated Financial Statements			
Financial Status (Baht: Million) [2/]			
Total Assets	13,602.63	17,343.61	15,877.71
Total Liabilities	12,604.78	16,300.91	14,877.73
Total Shareholders' Equity	997.85	1,042.70	999.98
Financial Ratio			
Debt-to-Equity Ratio (times)	12.63	15.63	14.88
Debt-to-Equity Ratio (times) (Not including accumulated Overcollection)	6.33	6.32	5.54
Fix Charge Coverage Ratio (times)	9.77	8.74	2.11
Remark [2/] Consolidated Financial Statements			

Factor Impacting Performance

ICAO Global and Regional Air Navigation Plans

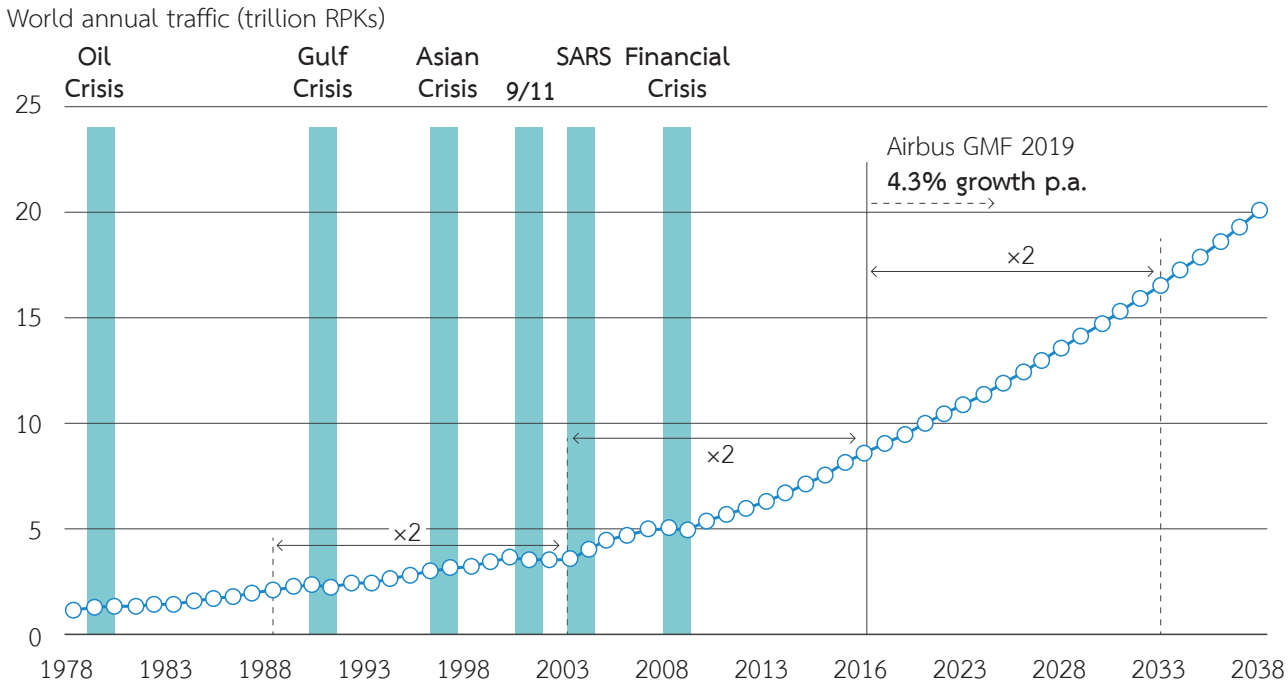
The 40th Session of the ICAO Assembly in 2019 adopted the sixth edition of Global Air Navigation Plan (GANP) as a strategic direction for global air navigation system development. In this edition, Aviation System Block Upgrades (ASBUs), the stepwise implementation strategy identifying current and emerging technologies and operational procedures required, subject to operational needs, to enhance air navigation system, is still the major component. Implementation period has been set in step with every 6 month period. Moving towards the adoption of performance-based approach, compared to the previous editions, Key Performance Indicators (KPIs) for measuring the performance obtained by the implementation of the specified ASBUs elements are also provided in this edition to assist aviation stakeholders in assessing and analyzing the performance gap between their current air navigation systems and the air navigation systems where technologies and operational procedures identified in ASBUs are implemented. With such evidence-based performance measurement framework, the involved stakeholders will be able to not only better prioritize their initiative deployment but also achieve the better resource management.

At the regional level, also in 2019, the 30th Meeting of ICAO Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/30) adopted the Asia/Pacific Seamless Air Navigation Service (ANS) Plan, Version 3.0 as the regional strategic objectives to achieve the seamless air navigation service in Asia/Pacific region. In this Plan, technologies and operational procedures stated in ASBUs which are considered necessary for the enhancement of Asia/Pacific-specific operational environment are identified together with their corresponding implementation priorities. Moreover, to further improve the seamless Air Traffic Management (ATM) operations, performance objectives in terms of Preferred Aerodrome/Airspace and Route Specifications (PARS) and Preferred ATM Service Levels (PASL) are also defined, including human performance as well as civil/military cooperation. Besides, compared to the previous versions, the new initiatives are added in this version and the target implementation date previously specified is extended to also include the newly introduced implementation phase covering until 2022.

Taking into account the importance of aforementioned global and regional plans, AEROTHAI has set its strategic objectives and strategies in accordance with those plans and continuously ensured that the required developments are in place in a timely manner.

Outlook of Aviation Industry and Trends in Air Traffic

Prior to the COVID-19 pandemic crisis, the outlook of aviation industry and future trends of air traffic illustrated that the aviation industry was one of the industries with increasing growth and value. Airbus forecasted that air traffic would grow at an estimated annual growth rate of 4.3% during the period of 2019-2038 (the next 20 years), and air traffic would double itself every 15 years.



TRAFFIC HAS PROVEN TO BE RESILIENT TO EXTERNAL SHOCKS AND DOUBLES EVERY 15 YEARS

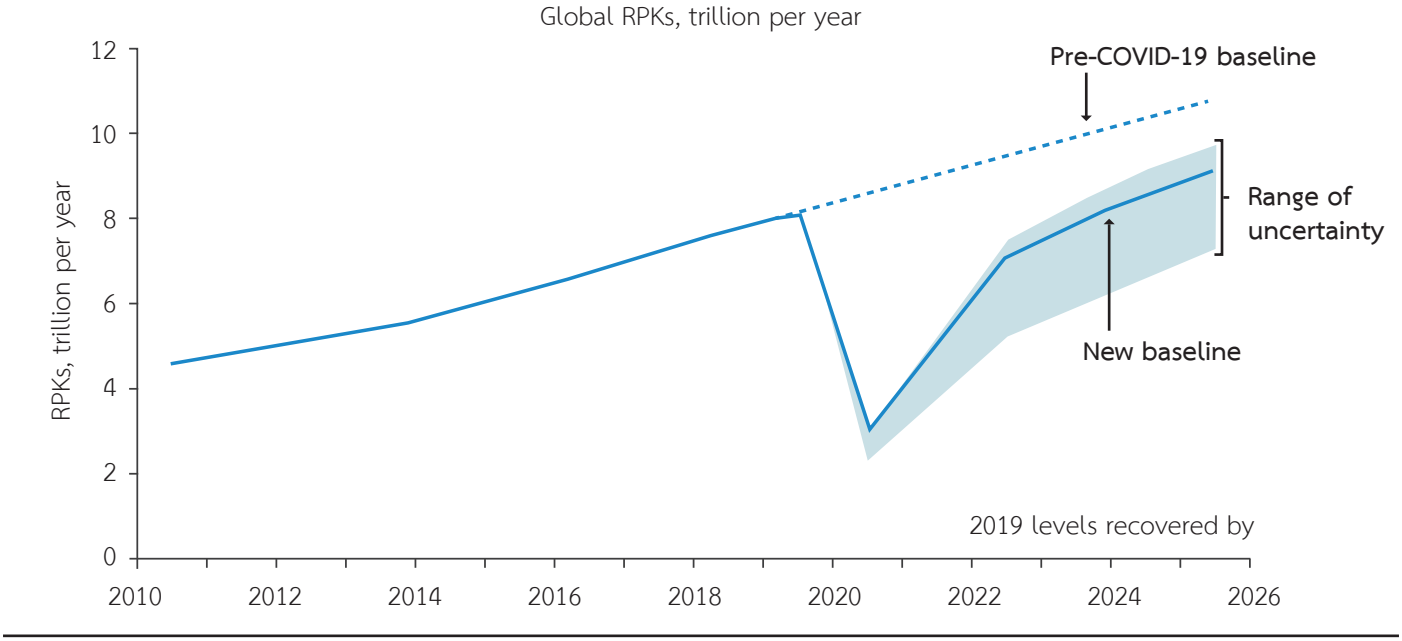
Source: ICAO, Airbus GMF 2019

*RPK: Revenue Passenger Kilometer

The COVID-19 pandemic impacted the economy at a global scale, particularly the airline business which was highly affected, causing many countries around the world to enforce lockdowns of varying degrees. For Thailand, international flight volume has started to decline since March 2020. Domestic air travels started to suffer since the Emergency Decree on Public Administration in Emergency Situation was issued on 26 March 2020, resulting in the lowest number of passengers and domestic and international flight volumes in April 2020. However, the situation has started to resolve after Thai licensed airlines resumed their flights in May 2020.

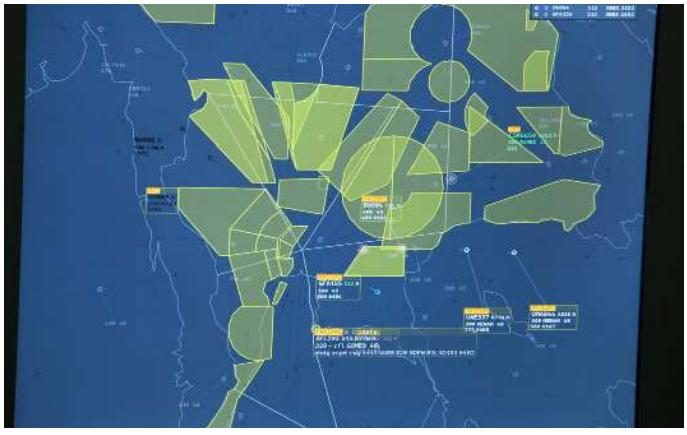
This outbreak was estimated to be more serious than any past events, including SARS (2003), Avian Flu (2013) and MERS Flu (2015), in terms of more broadly affected areas around the world and prolonged time. The International Air Transport Association (IATA) evaluated the impact of COVID-19 on global aviation business (as of 28 July 2020) and estimated that domestic travel will resume faster than international travel; it is expected that the situation will return to normal to the same level as before around 2024.

RPK forecasts downgraded; 2019 regained only by 2024
75% growth now forecast for 2021 but RPKs still 36% below 2019 levels



Source: IATA/Tourism Economics' Air Passenger Forecasts' July 2020

In 2020, traffic within Bangkok FIR has been affected by the COVID-19 crisis, resulting in the total volume of 616,905 flights, a 41% decrease from the previous year. It is forecasted that the impact will continue to prolong into the next year, but a positive trend is expected with government-sponsored policies.



Company's Structure

Organization Chart

- Expert, Executive Vice President Level
- Expert, Senior Director Level
- Expert, Director Level

Office of the President at all level 5 personnel

Board Committee

President

Executive Vice President

Office of Internal Audit

*Director attached to Board of Directors

- Core business and Information Technology Audit Bureau
- Core business Support Audit and Audit Planning Bureau

Export
Director Level 6 personnel

Office of Business Development

Business Unit

- Business Management Bureau
  - Business Strategy and Product Development Department
  - Domestic Business Services Department
  - International Business Services Department
  - Business Support Department
- Engineering Services Bureau
  - Radio Communications System Services Department
  - Aeronautical Network Operations Services Department
  - Manufacturing and Maintenance Department

Office of Policy and Strategy

- Policy and Strategy Management Bureau
  - Group of Policy Analysis and Strategy Planning
  - Group of Project Analysis
  - Group of Organization Development
  - Group of Risk and Performance Management

Office of Safety and Standards

- Safety and Standards Bureau
  - Services Standards Department
  - Safety Management Department
  - Test Equipment Calibration Laboratory
- Flight Inspection Services Bureau
  - Aircraft Operation Department
  - Aircraft Engineering Department

Office of the President

- Corporate Communication and Relations Management Bureau
  - Corparate Communication Department
  - Corporate Relations Department
- General Administration Bureau
  - Legal Affairs Department
  - Procurement and Inventory Control Department
  - Secretary and Documents Department

- Expert, Executive Vice President Level 2 personnel
- Expert, Senior Director Level 4 personnel
- Expert, Director Level 6 personnel

Office of the President at all level 5 personnel

Air Traffic Management Office

- Bangkok Area Air Traffic Control Management Bureau
  - Group of Bangkok Area Air Traffic Control
  - Group of Bangkok Area Air Traffic Control Administration
- Bangkok Terminal Air Traffic Control Management Bureau
  - Group of Bangkok Terminal Air Traffic Control
  - Group of Bangkok Teminal Air Traffic Control Administration
- Air Traffic Management Network Bureau
  - Network Operations Air Traffic Management Center
  - Aeronautical Information and Flight Data Management Center
  - Procedure Design and Airspace Development Department

Provincial and Facilities Management Office

- Provincial Approach Air Traffic Control Management Bureau
  - Group of Provincial Approach Air Traffic Control
  - Group of Provincial Approach Air Traffic Control Administration
- Provincial Air Traffic Management Bureau 1
  - Phuket Air Traffic Control Center
  - Hat Yai Air Traffic Control Center
  - Surat Thani Air Traffic Control Center
  - Hua Hin Air Traffic Control Center
- Provincial Air Traffic Management Bureau 2
  - Chiang Mai Air Traffic Control Center
  - Phitsanulok Air Traffic Control Center
  - Udon Thani Air Traffic Control Center
  - Ubon Ratchathani Air Traffic Control Center
  - Nakhon Ratchasima Air Traffic Services Engineering Operations Center
- Facilities Management Bureau
  - Construction Planning and Supervision Department
  - Electrical Power and Telephone Services Department
  - Facilities and Utilities Department
  - Security Department

Air Traffic Services Engineering Office

- Air Traffic Services Engineering Bureau
  - Air Traffic Communication Systems Engineering Department
  - Air Traffic Navigation Systems Engineering Department
  - Air Traffic Surveillance Systems Engineering Department
  - Air Traffic Data Systems Engineering Department
- Air Traffic Services Engineering Support Bureau
  - Air Traffic Services Engineering Research and Development Department
  - Air Traffic Services Engineering Operational Center
  - Engineering Systems Design and Installation Department
- Information Technology Bureau
  - Information Technology Systems Management Department
  - Information Technology Systems Development Department

Human Resources Office

- Human Resource Management and Quality of Work Life Bureau
  - Human Resource Management Department
  - Services Department
  - Staff Welfare Department
- Human Resource Development and Learning Promotion Bureau
  - Human Resource Development - Operations Department
  - Human Resource Development - Engineering Department
  - Human Resource Development and Learning Management Department

Finance Office

- Finance and Accounting Bureau
  - Finance Department
  - Revenue and Accounting Department
  - Budget Department

The Committees

There are Committees as follows:

- The Board of Directors
- The Executive Committee
- The Audit Committee
- The Risk Management Committee
- The Remuneration Committee
- The Corporate Governance and Corporate Social Responsibility Committee
- The Legal Committee
- The Dependent Directors
- The Labour Relations Committee

The composition of the Board of Directors at the end of fiscal year 2020 was as follows:

1.	Air Chief Marshal Siwakiat	Jayema	Chairman
2.	Mr. Lavaron	Sangsnit	Vice Chairman
3.	Mr. Puttipong	Prasarttong-Osoth	Director
4.	Mrs. Phongsaward	Guyaroonsuith	Director
5.	Professor Dr. Amorn	Pimanmas	Director
6.	Mr. Somnuk	Rongthong	Director

Air Chief Marshal Siwakiat Jayema
Chairman

Mr. Lavaron Sangsnit
Vice Chairman

Mr. Puttipong Prasarttong-Osoth
Director

Mrs. Phongsaward Guyroonsuith
Director

Professor Dr. Amorn Pimanmas
Director

Mr. Somnuk Rongthong
Director

Company's Senior Management

Mr. Somnuk Rongthong
President

Mr. Tinnagorn Choowong
Executive Vice President
(Operations)

Mr. Suttipong Kongpool
Executive Vice President
(Safety and Standards)

Mr. Nuttawat Supanundha
Executive Vice President
(Engineering)

Miss Duangta Samitsuwan
Executive Vice President
(Administration)

Mr. Sukluer Chiawarcheep
Executive Vice President
(Policy and Human Resources)

Company's Senior Management

Mrs. Sirikes Niemloy
Vice President
(Air Traffic Management)

Miss Tipaporn Nippakakorn
Vice President
(Office of Policy and Strategy)

Mr. Channarong Chuacharoen
Vice President
(Air Traffic Service Engineering)

Mrs. Chidkamol Soonthornsit
Vice President
(Finance)

Mr. Chatri Sasipayungsak
Vice President
(Office of Standards and Safety)

Mr. Chumnan Ruechai
Vice President
(Provincial and Facilities Administration)

Mr. Teekayu Muratha
Vice President
(Office of Internal Audit)

Miss Voraporn Rhodyoo
Expert,
Vice President Level

Mrs. Thaniya Suntharasantic
Vice President
(Office of the President)

Mr. Surachai Nuprom
Vice President
(Office of Business Development)

Mr. Chana Tadtasai
Vice President
(Human Resource)

Mr. Paisan Praneetpongrang
Expert,
Vice President Level

Company's Senior Management

1. Mr. Somnuk Rongthong

Present Position: President

Date of Birth: 7 July 1961

Age: 59

Starting Work at AEROTHAI: 15 May 1984

Date to Become AEROTHAI President: 1 August 2018

Education:
- Bachelor of Engineering, Kasetsart University

Additional Education Qualifications:
- National Defence College (Class of 56)
- Air War College (Class of 36 in 2002)
- Advanced Management Program (AMP), Wharton, University of Pennsylvania (Year 2013)
- Diploma, Joint State-Private Sector Course, National Defence College, National Defence Studies Institute (Class of 26 in 2014)

Work Experiences:

Years 2018-2020	President
Years 2012-2018	Executive Vice President
Years 2010-2012	Vice President (Air Traffic Services Engineering)

2. Mr. Tinnagorn Choowong

Present Position: Executive Vice President (Operations)

Date of Birth: 19 September 1962

Age: 58

Starting Work at AEROTHAI: 1 July 1986

Education:
- Diploma in Aviation Communication, Civil Aviation Training Center (Thailand)
- Bachelor of Political Science, Ramkhamhaeng University

Additional Education Qualifications:
- Air War College (Class of 47 in 2013)
- Leadership Succession Program (LSP), IRDP (Class of 3 in 2015)

Work Experiences:

Years 2018-2020	Executive Vice President (Operations)
Years 2015-2018	Executive Vice President
Years 2012-2015	Vice President (Air Traffic Management)

3. Mr. Suttipong Kongpool

Present Position: Executive Vice President (Safety and Standards)

Date of Birth: 14 January 1966

Age: 54

Starting Work at AEROTHAI: 1 July 1990

Education:
- Bachelor of Communication Arts, Bangkok University

Additional Education Qualifications:
- Air War College (Class of 46 in 2012)
- Leadership Succession Program (LSP), IRDP (Class of 2 in 2014)
- Advanced Executive Program (AEP), Northwestern University (Class of 2 in 2014)

Work Experiences:

Years 2018-2020	Executive Vice President (Safety and Standards)
Years 2017-2018	Executive Vice President
Years 2015-2017	Expert, Executive Vice President Level

4. Mr. Nuttawat Supanundha

Present Position: Executive Vice President (Engineering)

Date of Birth: 2 November 1959

Age: 60

Starting Work at AEROTHAI: 2 May 1985

Education:
- Bachelor of Engineering (Computer Engineering), King Mongkut's Institute of Technology Ladkrabang

Additional Education Qualifications:
- Royal Thai Army War College (Class of 58 in 2013)
- Leadership Succession Program (LSP), IRDP (Class of 4 in 2015)

Work Experiences:

Years 2018-2020	Executive Vice President (Engineering)
Years 2016-2018	Vice President (Office of Business Development)

5. Ms. Duangta Samitsuwan

Present Position: Executive Vice President (Administration)

Date of Birth: 14 November 1963

Age: 56

Starting Work at AEROTHAI: 1 January 1995

Education:
- Bachelor of Laws, Ramkhamhaeng University
- Master of Arts Program in Political Science (Public Administration), Thammasat University

Additional Education Qualifications:
- Advanced Certificate Course in Public Economics Management for Executives, King Prajadhipok's Institute (Class of 11 in 2013)
- Leadership Succession Program (LSP), IRDP (Class of 2 in 2014)

Work Experiences:

Years 2018-2020	Executive Vice President (Administration)
Years 2016-2018	Vice President (Office of Internal Audit)

6. Mr. Sukluer Chiawarcheep

Present Position: Executive Vice President (Policy and Human Resources)

Date of Birth: 10 March 1963

Age: 57

Starting Work at AEROTHAI: 1 July 1986

Education:
- Bachelor of Engineering (Electrical Engineering), Kasetsart University
- Master of Business Administration (Business Administration), Kasetsart University

Additional Education Qualifications:
- Leadership Succession Program (LSP), IRDP (Class of 5 in 2015)
- Air War College (Class of 40 in 2006)

Work Experiences:

Years 2019-2020	Executive Vice President (Policy and Human Resources)
Years 2017-2019	Expert, Executive Vice President Level

Human Resource and Organization Development

At the end of the fiscal year 2020 (30 September 2020), the total number of staff employed by AEROTHAI was 3,217 distributed as follows:

Head Office	1,758
Suvarnabhumi Airport	461
Don Mueang International Airport	192
Phuket Air Traffic Control Centre	151
Hat Yai Air Traffic Control Centre	121
Surat Thani Air Traffic Control Centre	91
Hua Hin Air Control Centre	44
Chiang Mai Air Traffic Control Centre	142
Phitsanulok Air Traffic Control Centre	101
Udon Thani Air Traffic Control Centre	79
Ubon Ratchathani Air Traffic Control Centre	41
Nakhon Ratchasima Air Traffic Services Engineering Operations Centre	36
Total	**3,217**

Total of Number of Contracted Employees

As at 30 September 2020, the total number of contracted employees employed by AEROTHAI was 35 distributed as follows:

Male	11
Female	24
Total	**35**

Total Staff and Contracted Employees Expenditure

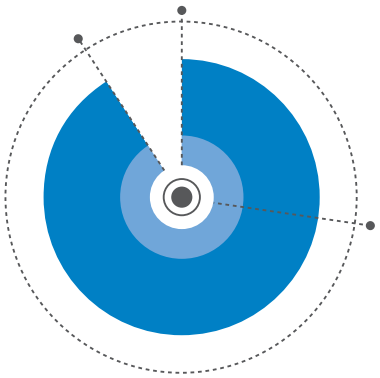
Unit: Million Baht

Description	2020	2019	2018
Staff's Expenditures and Benefits	7,989.01	9,612.41	7,630.23
Temporary Employees Expenditures	11.32	10.85	10.66

Share Capital and Shareholders Structure

Airlines Shareholders 112 (as at 1 August 2020)

Airlines 600,000 shares
at Baht 60 million



Government 6,000,000 shares
at Baht 600 million

In the fiscal year 2020, the A Shareholders and B Shareholders were as follows:

The A Shareholders	Number of Shares
The Ministry of Finance	6,000,000

The B Shareholders (Airlines) and the Top 10 Highest Number of Shares

No.	B Shareholders	No. of Shares
1	THAI AIRASIA COMPANY LIMITED	114,062
2	THAI LION MENTARI COMPANY LIMITED	55,667
3	THAI AIRWAYS INTERNATIONAL PUBLIC COMPANY LIMITED	51,910
4	NOK AIRLINES PUBLIC COMPANY LIMITED	49,691
5	BANGKOK AIRWAYS PUBLIC COMPANY LIMITED	46,617
6	THAI SMILE AIRWAYS COMPANY LIMITED	34,963
7	THAI VIETJET AIR JOINT STOCK COMPANY LIMITED	14,856
8	SPRING AIRLINES	14,002
9	CHINA SOUTHERN AIRLINES	12,295
10	AIR ASIA SDN BHD	11,782
11	Other 102 airlines	194,155
	Total B Shareholders	600,000

Remark: Names of Shareholders allocated shares on 1 August 2020.

State Enterprise's Loans

Unit: Million Baht

Bank	Credit Limit	Balance as at 30 September			Type of Guarantee
		2020	2019	2018	
Government Savings	1,650.00	317.13	444.07	571.01	none
Total	1,650.00	317.13	444.07	571.01	

Major Plans and Projects

Plans and Projects Completed in 2020

1. Air Navigation Service Infrastructure Development Project

(Implementing Years 2012-2020 with an investment budget of Baht 4,460.31 million)

To develop the air navigation service infrastructure project of Thailand to have a potential air navigation service system and competitiveness conforms to the standards and today's aviation technology as well as having the potential to accommodate more flight volumes.

In 2019–2020, AEROTHAI has commissioned the new air traffic control system (Thailand Modernization CNS/ATM System: TMCS) at Regional Air Traffic Control Centre, Regional Approach Air Traffic Control Centre, Bangkok Terminal Air Traffic Control Centre, the Air Traffic Control Towers throughout the Country and the last place, the Bangkok Area Control Centre opened in February 2020.

2. Developing Approach Control Service at Hua Hin Air Traffic Control Centre

(Implementing Years 2018-2020 with investment budget of Baht 134.72 million)

During the Company's TMCS transition, Hua Hin Air Traffic Control Centre has developed its approach control service to be ready for the expansion of air navigation service capacities and capabilities to support traffic growth in the future. Moreover, to be in line with the Government's policy on Hua Hin Airport's development to fully support commercial aviation, in 2019, the equipment and system supply contract has been signed and the system installation and testing have completed in 2020.

3. Construction of an Air Traffic Control Tower, the DVOR/DME Station and Staff Accommodation Building at Betong Airport

(Implementing Years 2018-2021 with investment budget of Baht 130.26 million)

As the Cabinet approved the project to construct Betong Airport in Yala (under the Department of Airports), AEROTHAI is required to construct an Air Traffic Control Tower, the DVOR/DME station and Staff Accommodation Building at Betong Airport to accommodate the operations of Betong Airport. In 2018, AEROTHAI has coordinated with the Department of Airports to consider the construction sites. In 2019, AEROTHAI signed the contract for the construction of an Air Traffic Control Tower and Supporting Building. The contractor completed the contract in 2020 and the Company is ready to provide services at the airport according to the Government's policy.

Plans and Projects Being Implemented

1. **Acquisition and Installation of Multilateration (MLAT) Systems at Chiang Mai and Phuket Airports**

   (Implementing Years 2020-2022 with investment budget of Baht 240.90 million)

   In order to increase safety in the ground surveillance efficiency, the Company has chosen to implement the Multilateration System (MLAT) at high density regional airports. The MLAT System utilizes new technology to provide surveillance data that includes aircraft and vehicles identification as well as highly accurate positioning to gain ground surveillance on runways, taxiways, and gate areas, as well as an ability to better detect runway incursions. In 2020, the details and technical specifications of the equipment have been completed. It is expected that contract can be signed in 2021 and installation/test of the Systems can be completed in 2022.

2. **Acquisition and Installation of Network Equipment to Support Multilateration (MLAT) Systems at Chiang Mai and Phuket Airports**

   (Implementing Years 2019-2021 with investment budget of Baht 38.40 million)

   MLAT system is implemented to provide ground surveillance as required for high density traffic movements at Phuket and Chiang Mai Airports. Such MLAT installation requires an appropriate communication network infrastructure in order to support an efficient air traffic service. Suitable MLAT coverage areas were evaluated in accordance with airport development plans for these 2 Airports. In 2020, the details and technical specifications for procuring the equipment in line with the MLAT installation sites have been completed. The procurement and installation process will be completed in 2021.

3. **Strategic Work to Support ATM Activities under ASEAN Single Aviation Market Establishment Plan and Seamless ASEAN Sky Concept**

   (Implementing Years 2016-2021)

   As the work on ASEAN Single Aviation Market (ASAM) and Air Traffic Management (ATM) were prioritized as one of the top technical works, AEROTHAI has continuously participated in ASEAN Air Transportation Working Group (ATWG) meetings since 2009 as Thailand delegation's supporting representatives, who have played important roles in considering/proposing/executing in ATWG to support the work under the ASAM Roadmap. In 2018, AEROTHAI together with ASEAN Member States finished developing an ASEAN ATM Master Plan as part of the key activity under the ASEAN Transport Strategic Plan (ATSP) 2016-2025. Since 2018, AEROTHAI has taken proactive actions to support other important activities under ASEAN ATM Master Plan by attending meetings of ASEAN Air Transport Technical Cooperation Sub-Working Group (ATTC), ATM Strategic Planning Group (ATM SPG) and participating in ASEAN collaboration activities such as Enhanced ASEAN Regional Integration Support from the European Union (ARISE Plus) project. AEROTHAI also sent representatives to observe meetings of high level ASEAN as appropriate and continue to implement and/or support work of the Civil Aviation Authority of Thailand under the ASEAN Air Traffic Management Plan. In 2020, ASEAN Member States aspires to improve the plan to keep it up to date in order to respond to regional and global plans. Thailand plays an important role in improving Chapter 3 (Current Situation) and Chapter 5 (Development Programme) of the plan. The plan is expected to be adopted through the ASEAN Senior Transport Officials Meeting (STOM) Forum and the ASEAN Transport Ministers Meeting (ATM) by 2021 to promote the ASEAN Single Aviation Market.

4. **Acquisition and Installation of Aeronautical Information Management (AIM)**

(Implementing Years 2018-2021 with investment budget of Baht 59.05 million)

The Project is implemented to increase the efficiency in Aeronautical Information Management (AIM) from modern technology standards that focus on the use of electronic technology in accordance with Roadmap for the Transition from AIS (Aeronautical Information Services) to AIM by the International Civil Aviation Organization (ICAO). In 2019, the contract was signed and it is expected that the system installation and testing will be completed in 2021.

5. **Acquisition of Doppler Very High Frequency Omni-directional Range/Distance Measuring Equipment (DVOR/DME) at Lampang, Narathiwat, Phetchabun, Roi Et, Nakhon Si Thammarat, and Surat Thani Airports**

(Implementing Years 2017-2022 with investment budget of Baht 147.47 million)

DVOR/DME systems that have exceeded 15 years of usage are showing signs of degraded performance and need additional emergency corrective maintenance. AEROTHAI needs to acquire new DVOR/DME systems at Lampang, Narathiwat, Phetchabun, Roi Et, Nakhon Si Thammarat, and Surat Thani Airports in order to replace the existing aged systems. In 2018-2019, the procurement process has begun but there was no candidate who met the technical criteria. In 2020-2021, AEROTHAI has started a new procurement process and installation/test of the equipment is expected be completed in 2022.

6. **Construction of a New Office Building (AEROTHAI Complex) at Headquarters, Tung Mahamek**

(Implementing Years 2020-2025 with investment budget of Baht 1,097.41 million)

Due to the limitation of working space within the headquarters, Tung Mahamek, as well as the Company's future policy to increase the Country's competitiveness and capability both in personnel and innovation, the Company has planned to establish an ATM Professional Centre. This place will have spaces, equipment, and systems supporting the development of aviation personnel and research to meet international standards and to solve the Company's problems as well as developing working systems for the future. A new office building at Headquarters is needed to provide additional working space for the Company's staff. When the new Air Traffic Management Centre (ATMC) is in operation, working space has to be suitably allocated and rearranged according to international security standards and the Company's policy. In September 2020, AEROTHAI has procured contractor for the design of AEROTHAI Complex Building at Tung Mahamek Headquarters. The design work is expected to be completed in 2021 and contractor for building construction will be procured in 2022.

Important Investment Projects for the Next 3 Years

1. **Construction of the Second Air Traffic Management Centre**

(Implementing Years 2020-2024 with investment budget being considered)

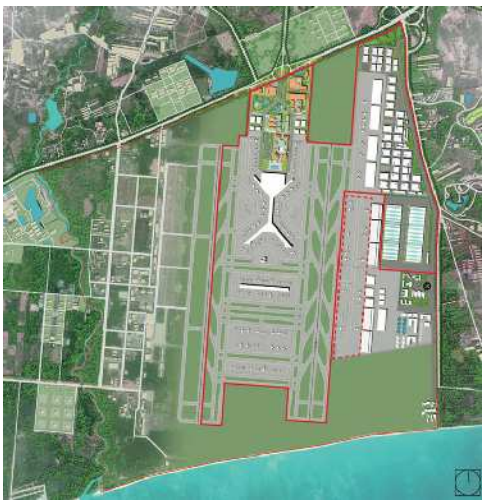
The Business Continuity Management (BCM) Policy by the Government is to enable the organization to operate its business continuously when affected by risks or threats from inside and outside the Company. AEROTHAI, as the Air Navigation Services Provider of Thailand, recognizes the importance and necessity of investing in systems/equipment for the air traffic control service with safety and efficiency even in times of threat or crisis. Therefore, AEROTHAI needs to consider establishing a secondary air traffic management facility independent of the current air traffic management facility under the Air Navigation Service Infrastructure to be the second air traffic management centre consisting:

1.1 Bangkok Area Control and Bangkok Approach Control

1.2 Bangkok Approach

1.3 Terminal Air Traffic Control at Suvarnabhumi and Don Mueang Airports.

In 2020, AEROTAHI is in the process of drafting the term of reference for the building design service of the 2nd Air Traffic Management Centre. It is expected that it can complete the contract for building design service provider in 2021 to estimate a budget for construction of the second air traffic management centre with systems/equipment.



2. The Air Navigation Services Provision at U-Tapao Airport

(Implementing Years 2020-2025 with investment budget of Baht 1,256.00 million)

On 30 October 2018, the Cabinet, at the 8/2018 Meeting, assigned AEROTHAI to provide air navigation services at U-Tapao Airport according to the recommendations of the Office of the Eastern Economic Corridor Committee and the Royal Thai Navy under the Development Project of U-Tapao Airport and Eastern Aviation City with the aim to develop U-Tapao airport to be the third major commercial international airport in Bangkok. Therefore, AEROTHAI has to carry out a project to prepare air navigation services at U-Tapao Airport aiming to start the air navigation services provision and related services in 2025. AEROTHAI is in the process of drafting a project details preparation for air navigation services at U-Tapao Airport to submit to the Ministry of Transport and Office of the National Economic and Social Development Council in 2021 then presentation to the Cabinet for project budget approval.

Important Role in the Global, Regional Forum and Others

1. SWIM in ASEAN Demonstration

AEROTHAI hosted System Wide Information Management (SWIM) in ASEAN Demonstration under SWIM in ASEAN Demonstration Project between 10-12 November 2019 at Mövenpick BDMS Wellness Resort Bangkok, Bangkok.

SWIM in ASEAN Demonstration is the project conceived under the cooperation framework between ASEAN and USA leading by Thailand and Singapore with the objectives to demonstrate the principles of SWIM, show its potential in operational benefits, and demonstrate a model of SWIM implementation for ASEAN and Asia-Pacific region. The scope of the Project includes not only ASEAN Member States but also the leading States/Administrations in Asia-Pacific region.

Progress/Achievements

This demonstration aims to showcase SWIM's value using the SWIM infrastructure designed and developed under the Project and through scenarios based on current and future operational concepts, which are of particular interest to our region. In addition to exhibiting the technical achievement obtained within this Project in enabling the seamless air traffic management system interoperability among aviation stakeholders, this demonstration marks the crucial milestone for SWIM development at global and regional levels.

Mr. Somnuk Rongthong, AEROTHAI President, and Mr. Tinnagorn Choowong, Executive Vice President (Operations) of AEROTHAI, participated in SWIM in ASEAN Demonstration

2. The Fourth Meeting of Air Traffic Flow Management Information Requirement Small Working Group (ATFM/IR/SWG/4)

AEROTHAI hosted the 4th Meeting of Air Traffic Flow Management Information Requirement Small Working Group (ATFM/IR/SWG/4) between 21–22 November 2019 at Courtyard by Marriott Hotel, Bangkok. ATFM/IR/SWG/4 was established by ICAO APAC ATFM Steering Group (ATFM/SG) to harmonize ATFM operational standards in Asia and Pacific Region especially between the operational standards from Distributed Multi-Nodal ATFM Project and ICAO North Asia Regional Harmonization Group (NARAGH) Project. The Meeting's outcomes will be reported to ATFM/SG to consider ATFM operational standards in Asia and Pacific Region.

Progress/Achievements

The Meeting encouraged the exchange of views regarding the adjustment in different ATFM operations of the two above-mentioned Projects in order to establish ATFM operational standards in the Asia and Pacific region. The ATFM operations that have been adjusted will be presented to ATFM/SG to be used in ICAO APAC ATFM Manual. This ATFM/IR/SWG/4 Meeting, therefore, has an important role in determine ATFM in the Asia and Pacific region.

3. Aviation Consultative Committee (ACC) (Thailand – Malaysia) Special Coordination Meeting

AEROTHAI hosted the ACC (Thailand – Malaysia) Special Coordination Meeting between 26-28 February 2020 at Proud Phuket Hotel, Phuket. AEROTHAI and Civil Aviation Authority of Malaysia (CAAM) have established Aviation Consultative Committee or ACC as a standing committee which meets every year or on special occasions. This floor serves to ensure mutual understanding and cooperation on Air Traffic Management (ATM) between the two neighboring countries. Pursuing Regional Seamless ATM, states/administrations in the region should be aware of all changes and developments, as well as cooperate with their neighbors to ensure smooth flow of traffic. This meeting paves the way for the Seamless ATM collaboration between Malaysia and Thailand.

Mrs. Sirikes Niemloy, Vice President (Air Traffic Management), a representative of AEROTHAI as a Co-Chair of Aviation Consultative Committee (ACC) Special Coordination Meeting.

Progress/Achievements

This Meeting serves to ensure mutual understanding and cooperation between Malaysia and Thailand to exchange their comments and suggestions for the related responsibilities, update the status on major Seamless ATM activities being planned, the use of current ATS Routes, Operational Procedures, engineering implementation, Surveillance Data Sharing and signing the reviewed Agreement of Special Air Traffic Services Coordination Procedure (ATSCP) as a continuous effort to improve ATM between the two FIRs.

Mr. Somnuk Rongthong, AEROTHAI President, presided over the Airspace Users - ANSP Meeting 2020.

Mr. Tinnagorn Choowong, Executive Vice President (Operations) of AEROTHAI, presented in the Airspace Users - ANSP Meeting 2020.

4. Airspace Users – ANSP Meeting

Airspace Users - ANSP Meeting is held twice a year during March and September of every year. The Meeting aims to provide Users of Air Navigation Services, offers significant opportunities for Airspace Users to meet Air Traffic Control Providers to share, and discuss the Joint Operation Work. This floor gives an opportunity for AEROTHAI to disseminate important projects and information undertaken during the year, including the development of various Air Traffic Services that are planned to be announced and implemented in the next year. There is also a session on the Report of the Results of the Annual Customers' Satisfaction Survey. In addition, it is a channel for reviewing the customer satisfaction survey results and for airspace users and air traffic controllers to develop relationship and express their opinions and recommendations which will be recorded as action items for further improvements of AEROTHAI's services to the highest satisfaction. It also creates platform to communicate important information to its users to acknowledge and to build relationship with its users both individual and organizational levels.

Progress/Achievements

AEROTHAI hosted the Airspace Users - ANSP Meeting on 18 February 2020 at Banyan Tree Hotel, Bangkok, on the theme of Digital Transformation. It was an opportunity to deliver AEROTHAI's implementations, plans, preparation for the digital era according to the Government's Thailand 4.0 policy. Also, AEROTHAI has presented progress reports on the development of various Air Traffic Services in the digital era such as High Intensity Runway Operations (HIRO) Project, Provincial Remote Virtual Tower Control System Project, Air Traffic Flow Management Performance Report for Asia-Pacific region, and the establishment of Airspace Management Cell for Civil-Military ATM Cooperation to airspace users and discussion for future improvement.

5. The Signing of Memorandums of Understanding (MoUs)

5.1 Signing Memorandum of Agreement between the Royal Thai Air Force and AEROTHAI for the year 2019

This Memorandum of Agreement creates a path for the Royal Thai Air Force (RTAF) and AEROTHAI to further work together in Operational Methodology of Aviation Practices, Technology and Human Resource Development. Both organizations aim at maximizing efficiency and safety, as well as the protection of the sovereignty of Thailand. RTAF and AEROTHAI also help support the development of commercial air navigation safety, in accordance with international standards. This Memorandum of Agreement is reviewed and signed once a year, in order to be consistent with current practices.

5.2 Signing Letter of Agreement (LOA) on Aeronautical Meteorology between Thai Meteorological Department and AEROTHAI in 2020.

To provide Aeronautical Meteorology Information Services in Thailand between AEROTHAI and Thai Meteorological Department (TMD). The main objectives of this LOA aim at safe and prompt information services and a consistent understanding of roles and responsibilities between the two organizations, in accordance with the requirements of the International Civil Aviation Organization (ICAO) and the Regulation of Civil Aviation Authority of Thailand on the Implementation of Joint Operating Agreements between Aeronautical Meteorological Service units and Air Navigation Service Provider, 2016 (B.E. 2559). This LOA is the revision of the LOA signed in 2018 in order to be consistent with current practices and services of the two organizations.

Air Chief Marshal Maanat Wongwat, RTAF Commander-in-Chief, and Mr. Somnuk Rongthong, AEROTHAI President, signed the Memorandum of Agreement on 26 December 2019 at the Royal Thai Air Force Headquarters.

Group Captain Somsak Khaosuwan, Director-General of TMD and Mr. Somnuk Rongtong, President of AEROTHAI signed the Letter of Agreement on Aeronautical Meteorology on 18 June 2020 at TMD Auditorium.

Company Operating Performance

Air Navigation Services

Air Traffic Service within Bangkok FIR

Type of flight	Traffic Movement (Fiscal Year)		Change	
	2019	2020	Increase (+) Decrease (-)	Increase (+) % Decrease (-) %
International Flights	510,451	252,760	(257,691)	(50.5)
Domestic Flights	427,255	301,708	(125,547)	(29.4)
Overfly Flights	108,035	62,437	(45,598)	(42.2)
Overall Flights	**1,045,741**	**616,905**	**(428,836)**	**(41.0)**

Traffic volume in Bangkok FIR in 2020 totaled at 616,905 flights, decrease of 41.0% from the previous year, which is decrease of 428,836 flights, equivalent to an average of 1,172 flights per day.

Airport Movements (Top Four Airports)

Airport Movements	Suvarnabhumi	Don Mueang	Phuket	Chiang Mai
Flight Type				
International	151,394	48,153	29,563	10,809
Domestic	59,158	134,694	30,938	40,350
Type of Operation				
S : Schedule	205,497	158,970	55,109	46,677
N : Non-Schedule	4,047	2,729	3,455	372
G : General	901	4,390	983	251
M : Military	8	15,624	686	2,429
X : Others	99	1,134	268	1,430
Overall Flights	210,552	182,847	60,501	51,159
Average per day	577	501	166	140
Changes percentage average per day (Fiscal Years 2020/2019)	**(44)**	**(37)**	**(48)**	**(39)**

Air Traffic Flow Management Service (ATFM Service)

Bangkok Air Traffic Flow Management Unit (Bangkok ATFMU) provides Air Traffic Flow Management (ATFM) service for domestic and international flights operating into constraint/ congested airports and airspace in Thailand and the Distributed Multi-Nodal ATFM Network (Southeast Asia, Southern China, Hong Kong and Macau).

In addition, Bangkok ATFMU provides ATFM service on behalf of Air Navigation Service Providers (ANSPs) involved for all fights planning to enter the Afghanistan airspace westbound during the busy night time period from South/Southeast Asia to Europe or from South Asia to North America using the Bay of Bengal Cooperative ATFM System (BOBCAT).

ATFM service is provided using systems developed in-house by AEROTHAI, with operations reported to ICAO Asia-Pacific ATFM Steering Group.

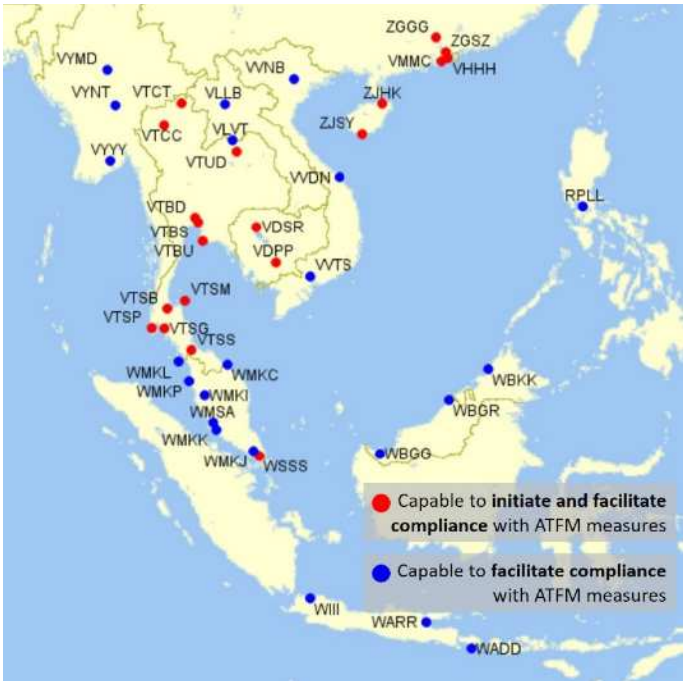
1. Asia-Pacific Cross-Border Distributed Multi-Nodal ATFM Network Collaboration Project (AMNAC)

AEROTHAI has been playing a joint leadership role in the Asia-Pacific Cross-Border Distributed Multi-Nodal ATFM Network Collaboration (AMNAC, new name of Distributed Multi-Nodal ATFM Network Project with ANSPs in China, Hong Kong, Singapore, Thailand, Australia and supported by other ASEAN Member States in developing ATFM service addressing international air traffic volume, also known as Cross-Border ATFM service. AEROTHAI joint leadership in the project is consistent with air traffic movement in Thailand, which consists of high proportion of international traffic, while some international airports such as Suvarnabhumi Airport services majority international traffic volume of approximately 80%.

Collaboration Project (AMNAC)

In the fiscal year 2020, the AMNAC project included 40 international airports supporting ATFM measures as depicted in the figure above, in addition to 26 domestic airports in Thailand (not depicted). The project is also working towards cross-border ATFM information exchange under System-Wide Information Management (SWIM) environment, which was featured as key operational scenarios of the SWIM in ASEAN Demonstration planned in November 2019 in Bangkok and Singapore.

AEROTHAI continued to provide ATFM service for constrained/ congested airports and airspace in Bangkok FIR, supporting full spectrum of planned and contingency events including military exercises, runway maintenance, flight checks and unplanned adverse situations. In addition, AEROTHAI provided ATFM service supporting ATM automation system transition activities under Thailand Modernization CNS/ATM System project, completing transition activities in February 2020.



List of Airports in the Asia-Pacific Distributed Cross-Border Multi-Nodal ATFM Network

Moreover, AEROTHAI has been supporting demand-capacity imbalance in neighboring countries within the Distributed Multi-Nodal ATFM Network and supporting air traffic flow restriction from other countries as required in various situations in accordance with ICAO expectations.

As the COVID-19 pandemic continues to spread globally, the need to activate ATFM measure continues to recede. However, exchange of Air Traffic Management/Air Traffic Flow Management (ATM/ATFM) Status Update continues to be required, especially in response to changing public health response and travel restrictions due to the COVID-19 pandemic. AMNAC project team expanded bi-weekly ATFM information exchange to cover all ATFM service providers in the Asia/Pacific region, publishing combined ATM/ATFM Status Updates on ICAO Asia/Pacific Regional Office's COVID-19 Business Continuity Planning website.

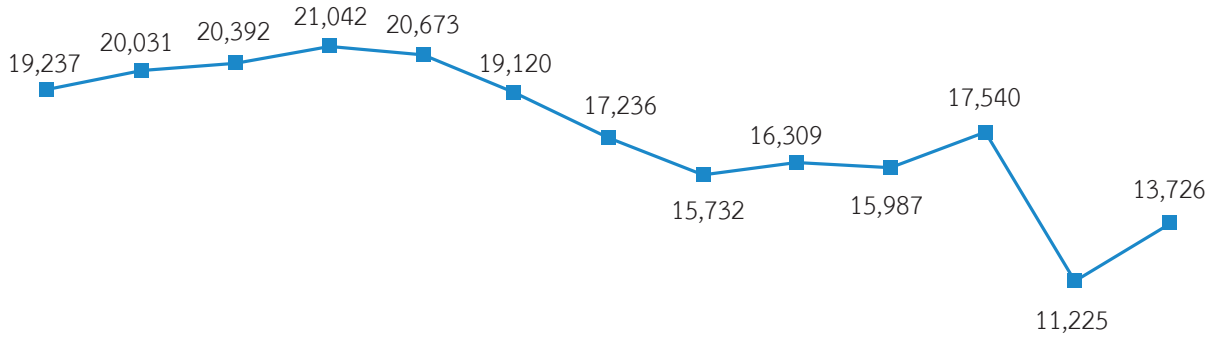
ATFM service provided help significantly reducing airborne holdings, greatly enhanced safety and efficiency of air traffic operations and improved operations predictability from all stakeholders' perspective.

2. Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT)

The Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT) was developed to streamline Air Traffic Flow Management operations for flights intending to transit the Afghanistan airspace westbound during the busy night time period. This is due to Afghanistan being key gateway for flights from South and Southeast Asia operating to Europe and flights from South Asia operating to North America.

AEROTHAI has been managing operations of the BOBCAT system through the Bangkok Air Traffic Flow Management Unit (Bangkok ATFMU) since 2007 with air traffic using BOBCAT ATFM service in each fiscal year as shown below:

Number of Flights Using BOBCAT ATFM Service per Fiscal Year



Fiscal Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Average Nightly Movement	53	55	56	58	56	52	47	43	45	44	48	50	38
Peak Nightly Movement	66	73	70	72	72	66	60	55	59	55	63	74	79

Based on data from the International Air Transport Association (IATA), it is estimated that since operational implementation of the ATFM procedure using the BOBCAT system to the end of fiscal year 2018, the airlines would have saved about 160 million kilograms of aviation fuel, which would translate into reduction of carbon dioxide emission reduction of about 660 million kilograms. This, in turns, assisted in cumulative airline cost savings of approximately US$ 160 million or Baht 5,000 million.

Throughout fiscal year 2020, westbound air traffic through Afghanistan airspace during BOBCAT operation hours increased by 22% when compared to fiscal year 2019. The change was influenced mainly by the Middle East airspace conflict in early 2020 and the COVID-19 pandemic later on in 2020.

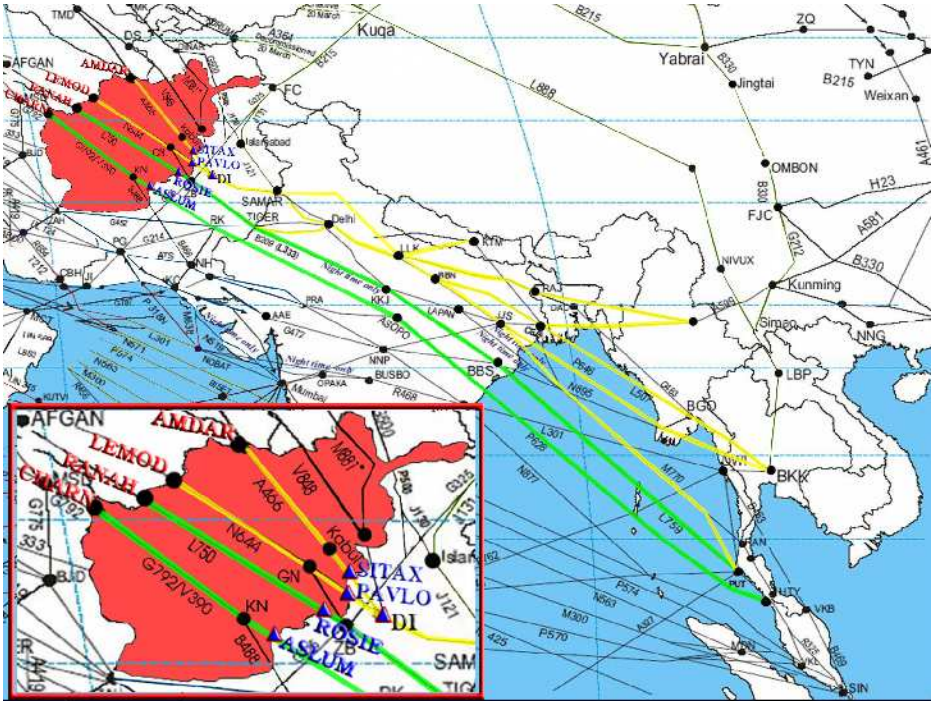
In January 2020, Middle East airspace conflict resulted in flights avoiding the Iraqi/Iranian airspace. Some traffic that would have otherwise routed via the Iraqi/Iranian airspace re-routed through the Afghan airspace. Consequently, the number of slot request in the BOBCAT system increased to 79 flights/night, the highest number of slot request since ATFM service using the BOBCAT system started operations.

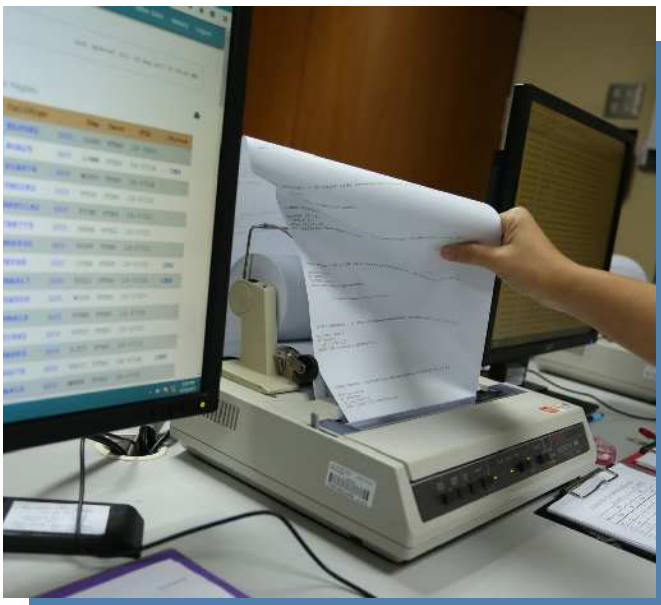
During the airspace conflict, AEROTHAI prepared additional contingency BOBCAT systems to support other overflight traffic flows through the Afghan airspace in response to request from the ICAO Asia/Pacific Regional Office, in case expansion of ATFM service was requested by Afghanistan.

Fortunately, as the conflict continues to thaw, in February 2020, the number of ATFM slot request per night continued to average at 70 flights/night, with maximum slot request of 78 flights/night. Nevertheless, no flight with BOBCAT ATFM slot continued into Iranian airspace in February 2020.

In March 2020, as the World Health Organization (WHO) declared COVID-19 pandemic, Europe/North America becomes epicenter of the pandemic and travel restrictions expand in those regions, the number of ATFM slot requests through Afghanistan started falling. In April 2020, an average of 5 flights/night requested ATFM slot through Afghanistan using the BOBCAT system, with maximum slot request of 11 flights/night.

Between May – September 2020, the number of ATFM slot requests through the Afghan airspace using the BOBCAT system continued to recover. In September 2020, an average of 26 flights/night requested ATFM slot through the BOBCAT system with maximum of 31 flights/night.





Aeronautical Communication Services

1. AEROTHAI provides aeronautical fixed services with automatic message switching capability for the exchange of messages among domestic and international aeronautical communication centres. The service is available 24 hours a day 7 days a week.

Bangkok Aeronautical Communication Centre is the main Aeronautical Communication Centre in Asia/Pacific Region for receiving, transmitting, and distributing aeronautical messages to all parties involved in Aeronautical Fixed Telecommunication Network (AFTN) and/or Aeronautical Telecommunication Network (ATN) followed ICAO Annex 10 Volume II.

2. The international circuits are directly connected through submarine cables, satellite and internet (through VPN service). Presently, AEROTHAI operates with direct circuit connections with 12 international aeronautical communication centres as follows:

Item	Circuit	Network	Signaling speed
1	Bangkok/Singapore	Submarine cable	64 Kbps
2	Bangkok/Hong Kong	Submarine cable	64 Kbps
3	Bangkok/Mumbai	Submarine cable	64 Kbps
4	Bangkok/Rome	Submarine cable	64 Kbps
5	Bangkok/Beijing	Submarine cable	64 Kbps
6	Bangkok/Kuala Lumpur	Satellite	32 Kbps
7	Bangkok/Phnom Penh	Satellite	64 Kbps
8	Bangkok/Yangon	Satellite	64 Kbps
9	Bangkok/Ho Chi Minh	Satellite	19.2 Kbps
10	Bangkok/Dhaka	Satellite	32 Kbps
11	Bangkok/Vientiane	Satellite	32 Kbps
12	Bangkok/Bhutan	Internet VPN	-

3. In the fiscal year 2020, 225,362,908 messages were handled by Bangkok Aeronautical Communication Centre. A total decrease of 18,990,322 messages or 7.77% in comparison to the last fiscal year.

Aeronautical Information Services (AIS)

AEROTHAI is responsible for the provision of Aeronautical Information Services such as flight plans, flight schedules, flight movement, aviation weather, Notice to Airmen (NOTAM) and others which are necessary for flight operations. The information is distributed to air navigation services providers, airlines, military airports and other government agencies in the Bangkok FIR and overseas. Details are as follows:

1. Notice to Airmen (NOTAM)
   - 1.1 NOTAMs are issued by AEROTHAI as the International NOTAM Office and are distributed through AFTN and/or ATN network according to ICAO Annex 15. NOTAM database provides NOTAM information through automatic request and reply service.
   - 1.2 During the fiscal year 2020, AEROTHAI processed a total of 16,465 NOTAMs which is a decrease of 2,292 NOTAMs or 12.22% in comparison to the last fiscal year.
2. Flight Plan and Air Traffic Service Messages
   - 2.1 AEROTHAI main responsibility includes the management of flight plan and air traffic service messages according to ICAO Document 4444.
   - 2.2 During the fiscal year 2020, AEROTHAI processed a total of 1,489,521 messages which are 787,328 Flight Plan messages.
3. Operational Meteorological (OPMET) Data Services

   AEROTHAI is a designated Regional OPMET Centre (ROC) as well as Regional OPMET Data Bank (RODB) according to ICAO Annex 3 and ROBEX Handbook.

Business Related Service

In the fiscal year 2020, AEROTHAI provided services in many projects in the fields of production, provision, installation, maintenance, survey, inspection, calibration, training for domestic and oversea organizations as follows:

1. Production, Provision and Corrective Maintenance Service

Twelve significant projects performed by AEROTHAI, were as follows:

- Provision, Installation and Improvement of Coastal radio system for the Naval Communications and Information Technology Department, Royal Thai Navy
- Provision of 3-Dimension Aerodrome Simulator for the Directorate of Communications and Electronics, Royal Thai Air Force
- Maintenance of Automatic Message Switching System (AMSS) for the Directorate of Communications and Electronics, Royal Thai Air Force
- Maintenance of Access Control for the Office of Election Commission of Thailand
- Maintenance of Voting Machine version IV for the Office of Election Commission of Thailand
- Provision of the Receiver Autonomous Integrity Monitoring (RAIM) Prediction Service for Vietnam Aeronautical Information Centre, Vietnam
- Provision of the Receiver Autonomous Integrity Monitoring (RAIM) Prediction Service for Partner Associates International Co., Ltd., Myanmar
- Supply, Delivery, Installation, and Commissioning of Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM), Meteorological Equipment & Other Related Goods and Services for Gautam Buddha Airport (GBA Project) for the Civil Aviation Authority of Nepal (CAAN), Nepal
- Provision of Relocating the Communication Satellite System for Thaicom Public Co., Ltd.
- Provision of Signal Light Gun for SAMART U-Trans Co., Ltd.
- Maintenance of Radio Communication System for PTT Public Co., Ltd. and walk-in maintenance of radio equipment for outside units
- Maintenance of Radio Communication System located along the gas pipeline for PTT Public Co., Ltd.

2. Flight Inspection Service

AEROTHAI provided flight inspection and validation service for various Navigation Aids: Differential Navigation Aids, Doppler Very High Frequency Omni Directional Range/Distance Measuring Equipment (DVOR/DME), Non Directional Beacon (NDB), Performance Based Navigation (PBN), Precision Approach Patch Indicator System (PAPI), Approach Light System (ALS) and Radio Navigation. Eleven projects inspected and validated by AEROTHAI were as follows:

- Flight inspection for PAPI at 9 airports: 6 airports of the Airports of Thailand Public Co., Ltd. and 3 airports of Bangkok Airways Public Co., Ltd. i.e. Suvarnabhumi, Don Mueang, Chiang Rai, Chiang Mai, Trat, Phuket, Samui, Sukhothai and Hat Yai.
- Flight Inspection for assessing the impact of structure of Phuket Airport building for Siam Land Flying Co., Ltd.
- Flight inspection for PAPI at Surat Thani Airport for S.N.K. LIGHT & COOL Co., Ltd.
- Flight inspection for PAPI at Phrae Airport for Axiomatic Co., Ltd.
- Flight Inspection for NDB (Commissioning Check) at Wing 4, Takhli Royal Thai Air Force Base for Siam Aviation Co., Ltd.

- Flight Inspection for ILS/DME at Wing 1 Nakhon Ratchasima for Unitech Associates Co., Ltd.
- Flight Inspection for ILS/DME at U-Tapao International Airport for Forth Public Co., Ltd.
- Flight Validation of PBN and related services for Lao Air Navigation Services (LANS), Laos
- Flight Inspection for ILS for CIT Lao Co., Ltd., Laos
- Flight Inspection and Validation at Different Airports in Cambodia for Cambodia Air Traffic Services Co., Ltd., Cambodia

3. Readiness Assessment for Implementation of Reduced Vertical Separation Minimum (RVSM) of ATC for Operation Service

AEROTHAI provided the service to 18 aircraft of 14 airlines and freight forwarders in 3 Countries, which are India, Pakistan, and the Philippines. Due to Corona Virus Disease 2019 (COVID–19) pandemic, the services have been suspended since March 2020 and AEROTHAI staff have not been allowed to travel abroad.

4. Test Equipment Calibration and Maintenance Service

AEROTHAI provided the service to 20 equipment for other 7 organizations such as CSPM Thailand Co., Ltd., Thai Aviation Service Limited, W&J Engineering Co., Ltd., Calibration Laboratory Co., Ltd., Suvarnabhumi Network Ltd., Part., Brilliant Performance Co., Ltd., and Deep Sea Navigation Co., Ltd. Moreover, AEROTHAI also provided the service to Cambodia Air Traffic Service Co., Ltd.

5. Rental of Communication Equipment Service for Airlines and Energy Sectors.

Furthermore, AEROTHAI was entrusted by aviation business sector and energy business sector to provide rental of Communication equipment service such as Trunked Radio, Conventional Radio, Air/Ground Radio and ATN Terminals & Printers to airlines and other aviation related agents at Suvarnabhumi Airport, Don Mueang International Airport, and all regional airports. For the fiscal year of 2020, total number of rental equipment amounted to 8,245 sets, a decrease of 3,761 sets or 31.32% compared with those of the previous fiscal year while the number of Digital Trunked Radio System (DTRS) was 2,730 sets, an increase of 109 sets or 4.16% compared with those of the fiscal year 2019.

6. Satellite Communication Services

AEROTHAI provided satellite communication services in order to support air traffic communication via voice and data to aviation organizations in 6 Countries namely: Bangladesh, Cambodia, Laos, Malaysia, Myanmar and Vietnam.

7. Airlines Operational Communication Services (AOC)

AEROTHAI installed remote ground stations (RGS) totaling 192 stations (150 ACARSs in 15 Countries and 42 VDLM2 in 7 Countries) to service airlines with a coverage of 15 Countries which are Australia, Brunei, Cambodia, India, Indonesia, Malaysia, Mongolia, Myanmar, New Zealand, Singapore, South Korea, Taiwan, Thailand, the Philippines, and Vietnam. AEROTHAI provided AOC service to 200 airlines. Number of aircraft amounted to 7,140 aircraft. Total number of aviation data was 134.85 million Kb., which was a decrease of 86.03 million Kb., or 38.95% from those of the last fiscal year because of the impact of COVID–19 pandemic on aviation industry in the region and worldwide since January 2020.

8. Air Situation Display/Ground Situation Display Service

AEROTHAI provided Air Situation Display/Ground Situation Display service for in-house use in order to strengthen the core business as a strategic arms to Aeronautical Information and Flight Data Management Centre and for other use pursuant to business objectives to other organizations, e.g. Bangkok Airways, Airports of Thailand PLC., Bangkok Aviation Center, and International Aviation College, Nakhon Phanom University.

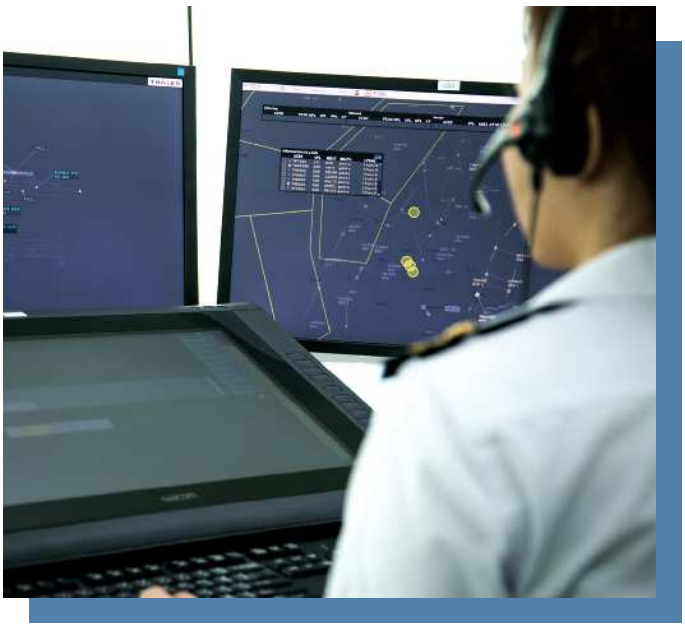
In the fiscal year 2020, AEROTHAI has conducted researches to develop new products, services, systems and technologies in order to support core business with the aim of developing personnel's potential and reducing expenditures on importing equipment from overseas as well as expanding the business opportunity by collaborating with other organizations.

Two products have been developed under the Research and Development of Products and Services as follows:

1. Job Tracking System (J-Track) is to send the Job Activity report via Digital Trunked Radio System (DTRS) to facilitate and manage the resource for the ground operators around the parking area. Utilizing the J-Track leads to the on-time service, the ground resource management efficiency, the increase of service effectiveness, and the decrease of miscommunication, congestion of voice channel and traffic. This system has been operated for Catering Service, Thai Airways International Public Co., Ltd.
2. High Intensity Airport Rotating Beacon is an electrical airport lighthouse to display the airport location for pilot to clearly see in the night time or poor visibility. The design of the Beacon, with its smaller design, is able to increase the brightness and contrast while reduce the loss of energy from the heat generated by conventional Halogen lamps.

Collaboration with other organizations in seeking the long-term business opportunities to ensure sustainable revenue is as follows:

1. Memorandum of Understanding with Entry Point North ATS Academy (EPN), Sweden, the high reputation organization in training service, was signed for providing CNS/ATM training courses for AEROTHAI staff and Air Navigation Service Provider in South East Asia and Asia Pacific region in March 2020.
2. Memorandum of Understanding with WM Simulator Co., Ltd., the expert in Simulator design and development, was signed for developing air traffic service simulator for domestic and international organizations in July 2020.



Human Resource Management

Human Resource Management and Quality of Work Life

Currently, AEROTHAI is facing challenges of changes from all directions such as ICAO's standards and recommended practices, Civil Aviation Authority of Thailand's regulations and Corona Virus Disease 2019 (COVID-19) pandemic. The ways of work life and everyday life have been changed to New Normal. The number of new generation has increased in the organization. Staff costs continued to rise while the number of flights tended to decrease. In addition, there has been technology disruption with work. AEROTHAI, therefore, had to make adjustment to preserve its sustainable growth in the long run. The Company continued to place high emphasis on strengthening the human capital's capabilities, so that the staff would have high agility in adapting themselves to work at their best in all conditions for AEROTHAI's maximum benefits.

In an attempt to upgrade the human resource management system according to State Enterprise Assessment Model (SE-AM), AEROTHAI needed to transform the working processes and enable HR staff to be proactive HR professionals. In the fiscal year 2020, AEROTHAI developed AEROTHAI HR Master Plan for the years 2021-2025, which helped indicate a clear direction for HR units going forward. The HR vision is to be proactive HR professionals in providing appropriate and cost-effective human capital management with an aim to help AEROTHAI attain higher efficiency and sustainable growth. Additionally, AEROTHAI developed Human Capital Management Working Manual to create better understanding company-wide and provide guidelines on the human capital management initiatives in accordance with State Enterprise Assessment Model (SE-AM), Chapter 6 Human Capital Management (HCM).

In the fiscal year 2020, AEROTHAI carried out implementations of development of human resource management systems in many dimensions as follows:

1. Installation and development of SAP Human Resource Information System (SAP-HRIS) as tool to support human resource management for maximum efficiency in performance, provide services to employees and be able to link with SAP accounting and finance.
2. Drafting a 10-year manpower plan (2021-2030) as framework for the preparation to deal with the changes in Thailand's future air navigation services environment and context. Various factors that may affect personnel from internal and external environments have been speculated. In addition, information has been collected from various units and used to set policy for the manpower management in 3 different scenarios.
3. Revising organizational culture under a new name of AEROTeam consisting of five main components: Accountability, Ethics, Result-Oriented, Operational Excellence, and Teamwork. AEROTHAI appointed a Culture Cultivation Committee and drafted the AEROTeam behaviour guidelines for personnel at all levels.
4. Changing the Employee Engagement Survey in a way that made it clearer and reduced the number of questions concerning engagement outcome as well as analysed and set priority to effectively handle the issues.
5. Issuing a new regulation relating to work-related travel expenses, mainly to make it up to date and clarify some unclear points.

Regarding quality of work life, due to COVID-19, AEROTHAI had to cut cost company-wide and suspended activities that required social gatherings. In the fiscal year 2020, there were major implementations as follows:

1. The Company made no new recruitment except those already agreed to hire and no replacement for retirees between 2020-2021.
2. The Board of Directors agreed in principle that the Company suspended the contribution to Staff Welfare Fund for 6 months (July-December 2020) as part of the reduction of expenditures to increase the Company's liquidity and the said measure did not cause any impact on the liquidity of the Staff Welfare Fund.
3. The Staff Welfare Committee agreed to set a limit for reimbursement of medical expenditures for COVID-19 tests for personnel who are in the risk group.
4. AEROTHAI encouraged the personnel to exercise by themselves by producing Healthy Channel – "Healthy Life after Working Hours," which is a website that offers all kinds of exercising videos for those who are interested.
5. AEROTHAI recognized the importance of saving environment and preventing global warming causes. The Company initiated the "Green Please" campaign that encourages less usage of plastics and wastes all across the organization.

Human Resource Development and Learning Promotion

The Company provided training, development and learning promotion for the Company's personnel in the areas of air navigation services, engineering and management to develop and promote personnel to have knowledge and competency according to the standards. This Included developing the potential of professional experts in the field according to the needs of the Company as well as developing and promoting a learning organization and an innovative organization. These have been implemented in accordance with the Corporate Plan for the years 2020-2024 to achieve the vision of "A Sustainable Quality Excellent Air Navigation Services Provider". There are two of the four strategic issues that are important to human resource development, which is the second strategic issue- Developing Employees Professionalism by developing and managing the Competency according to the IDP in accordance with the national aviation personnel development plan and the changes in aviation services. Personnel expertise have been improved by establishing development centre to focus on developing knowledge and advanced skills Including the development of operational training courses for certification from CAAT to support the establishment of training agencies in the future. And the third strategic issue - Becoming High Performance Organization (HPO) by having plans to promote/develop knowledge management (KM), research and innovation and a programme to develop and apply knowledge Innovation work. Summary of implementations are as follows:

Development

AEROTHAI has developed personnel by dividing into Leadership development and employee development as follows:

1. **Leadership Development:** divided into three position levels as follows:

1.1 Senior Executive Vice President and Vice President or equivalent: 3 courses

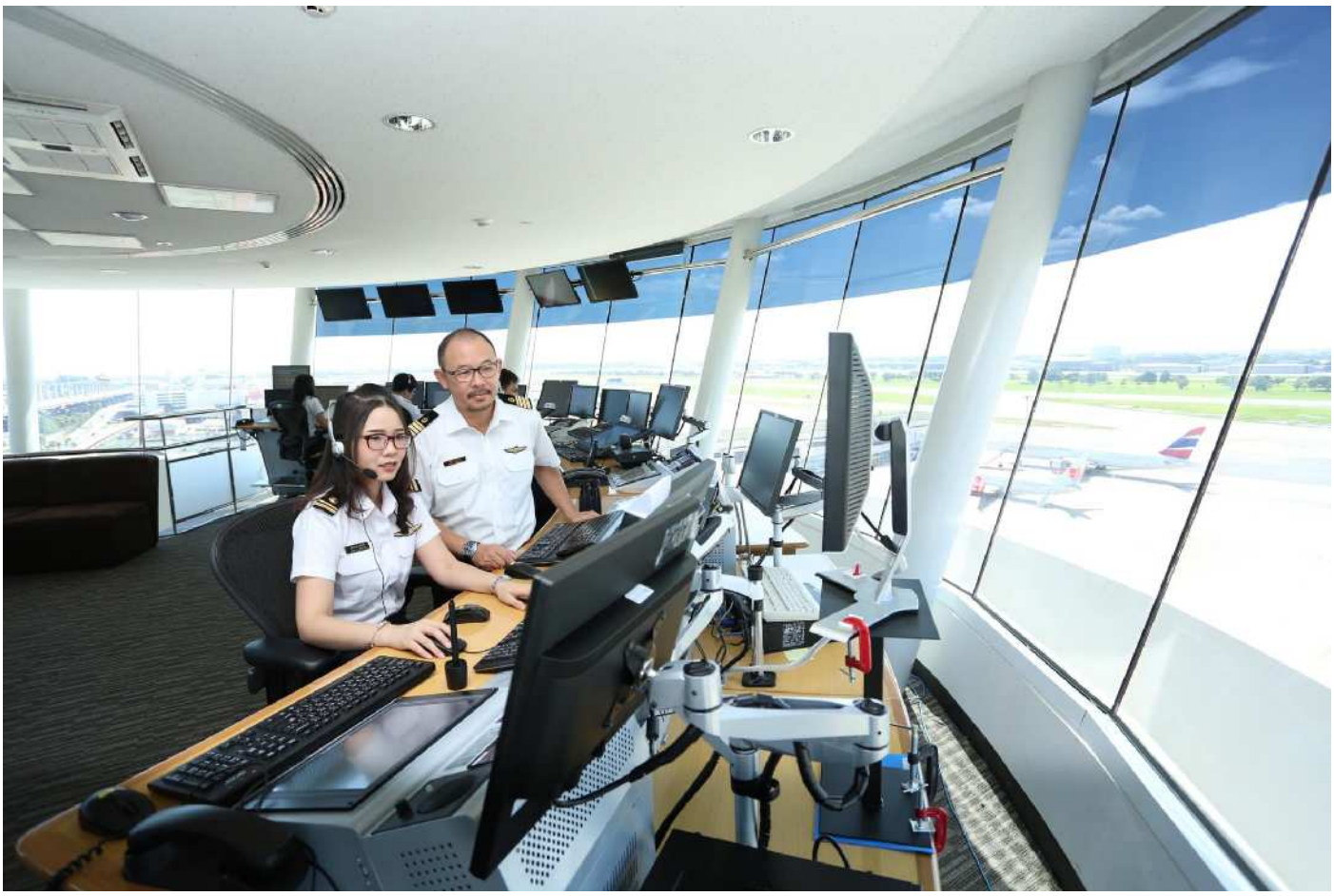
No.	Course Name	Number of Trainees (person)
1	National Defence College of Thailand (NDC)	1
2	Senior Executive of Anti-Corruption Strategy (NSO)	1
3	RTAF&CEO relationship	1

1.2 Senior Director or equivalent: 2 courses

No.	Course Name	Number of Trainees (person)
1	Air War College	1
2	Royal Thai Army War College	1

1.3 Director or equivalent: 3 courses

No.	Course Name	Number of Trainees (person)
1	Mid-Level Executive of the Transport	1
2	Managing of Human Resource Management (HRM)	24
3	Managing of Procurement and Inventory Control	30



2. Employee Development: divided into 3 areas, i.e. Operations, Engineering and Management

2.1 Human Resource Development: Operations

In the area of Human Resource Development: Air Traffic Services, AEROTHAI considered important factors affecting the development of operational personnel such as the Civil Aviation Authority of Thailand (CAAT) Announcement on the requirements of juristic persons type, the period of validation of the air operator certification and other duties of the air operator certification holder (2019), the CAAT Rule on Manual of Standards - Aeronautical Information Services (2020), the CAAT Rule on Manual of Standards - Air Traffic Management Services: Air Traffic Services (2020), the CAAT Regulation No. 17 on Air Navigation Services for Air Traffic Management: Air Traffic Services Standards and the CAAT Regulation No. 20 on Aeronautical Information Services Standards as inputs to identify the staff training needs.

AEROTHAI has developed staff's working potential to make sure that they can perform their tasks according to the CAAT's air traffic services standards (Manual of Standards). The Company has submitted 5 curriculums for CAAT to certify and provided the training courses for air traffic controllers as indicated in the table below.

Course Name	Number of Trainees (person)
1. Aerodrome Control Rating	31
2. Approach Control Procedural Rating	6
3. Approach Control Surveillance Rating	7
4. Area Control Procedural Rating	18
5. Area Control Surveillance Rating	18

AEROTHAI has developed staff competency by conducting training courses which provide the air traffic controllers with the necessary skills and knowledge to a level of competence in accordance with the CAAT Manual of Standards. AEROTHAI set a target that the number of personnel passed rating and received licences must be 100% of the number of personnel participated in the test. The table below shows the number of staff who achieved ATC licences and rating during the fiscal years 2018-2020.

Centre	Year 2018	Year 2019	Year 2020
Provincial Approach Air Traffic Control Centre	29	13	18
Bangkok Area Air Traffic Control Centre	10	15	17
Bangkok Terminal Air Traffic Control Centre	-	-	14
Number of staff	39	28	49
Number of staff achieved ATC licence/rating	39	28	49
Success Rate Percentage	100	100	100

Furthermore, AEROTHAI has developed training courses in accordance with a Unit Training Plan (UTP) which serves as a guideline for each unit in order to raise and maintain the quality of service and standards. In 2020, the Company provided training course as follows:

Course Name	Number of Trainees (person)
ISO 9001:2015 Introduction & Internal Auditor	30

Regarding Continuation Training (Conversion), AEROTHAI has developed air traffic control personnel for the new system and technology under the Thailand Modernization CNS/ATM Systems (TMCS) Project in accordance with TMCS Transition Roadmap and the new system has completely been commissioned . The Company has arranged a training course for the staff as follows:

Course Name	Number of Trainees (person)
TMCS Refresher Training for Bangkok Area Air Traffic Control Centre	16

In addition, AEROTHAI has to comply with the National Civil Aviation Security Training Program under the scrutiny of CAAT. After the Company's personnel passed and received instructor certificates, they can provide Specialized Training courses for air traffic controllers as indicated in the table below.

Course Name	Number of Trainees (person)
Specialized Training	
• Bangkok Area Air Traffic Control Centre	303
• Bangkok Terminal Air Traffic Control Centre	331
• Provincial Approach Air Traffic Control Centre	78
• Provincial Air Traffic Control Centres - 9 Centres	343

Due to the Coronavirus (COVID-19) pandemic, AEROTHAI's training and development policy has shifted from classroom training to online training. The Company has arranged 3 online courses for its staff (Operations, Engineering, Support and Business) and an online aviation English course for air traffic controllers to maintain their English skills and meet ICAO standards as follows:

Course Name	Number of Trainees (person)
1. ATC for Non-ATC	81
2. What really are AEROTHAI Standards	124
3. English Class Online for Pre-Intermediate (8), Intermediate (8) and Upper Intermediate (1)	258
4. Aviation English Class Online for Air Traffic Controller	89

2.2 Human Resource Development: Engineer

To comply with the Manual of Standards Communication, Navigation and Surveillance of the CAAT (CAAT-ANS-MOSCNS) Revision 01, 3 May 2019 and the ICAO Training Manual for Engineering Personnel Development as specified in the ICAO Doc.7192 Part E2, 2011, AEROTHAI together with EPN (Entry Point North), Sweden, has organized the On-the-Job-Training Instructor (OJTI) and Assessor courses to relevant engineers in the fiscal years 2019-2020. But due to the COVID-19 pandemic occurring around the world, AEROTHAI was unable to organize training courses with EPN. However, AEROTHAI has organized other internal engineering training courses via the Zoom Conference Application.

In addition, in the fiscal year 2020, AEROTHAI first launched five training courses on the Learning Management System (LMS). These 5 courses are Digital Fundamental Course, IP Cloud Network (Part 1) Course, SAP Fiori Tutorial - Employee Self-Service (ESS), CNS/ATM Technologies Disruption 2020 and Digital Voice Recorder (NEXLOG 740), and more courses will be opened on the LMS in the future.

2.3 Human Resource Development: Management

The Company has developed employee to be capable of both Employee Core Competency and Functional Competency by developing the AEROTHAI Competency Management System Development and Training Roadmap to prepare for the next capability assessment system.

However, even when the organization is affected by the COVID-19 situation, the Company still put great emphasis on learning and development. Therefore, continuous development is provided through online and AEROTHAI has arranged 8 courses as follows:

No.	Course name	Number of Trainees (person)
1	CNS/ATM Technology Disruption 2020	100
2	Official Letter Writing	131
3	ATC For Non ATC	202
4	What really are AEROTHAI Standards	124
5	English for Daily Life	171
6	English Class online (Pre-Intermediate, Intermediate, Upper Intermediate)	258
7	English Class online for Air Traffic Controller	89
8	Chinese	31

Learning Promotion

AEROTHAI has encouraged staff to use their knowledge ability and experience for work processes improvement, knowledge management and innovation by collecting and storing important knowledge through Knowledge Management Process in order to improve work systems that create value for the organization. Moreover, AEROTHAI has established standards and good practices in Knowledge Management to be able to develop the organization towards excellence, sustainability and add value to stakeholders.

In 2020, AEROTHAI has revised KM Master Plan for the years 2020–2024 and defined KM Structure with roles and responsibilities that focus on participation from staff of all levels to be a framework for implementing AEROTHAI knowledge management process. In this year AEROTHAI has collected and stored core knowledge as follows:

1. Knowledge in organization level 1 issue called "Thailand Modernized CNS/ATM Systems (TMCS) Lesson Learned" that will be learning point for future projects.
2. Knowledge from executive 2 issues are
   2.1 What really are AEROTHAI Standards? What are Aviation Standards?
   2.2 ATC for Non ATC
3. Operational knowledge, which identified and managed by departments according to AEROTHAI KM process, are 56 issues that have been collected and stored through department website and KM AEROTHAI website.

AEROTHAI has continued to put emphasis on internal innovation promotion. AEROTHAI has focused on developing ideas and innovation according to the demand of the Company. There are 14 innovations entered the competition for AEROTHAI INNOVATION AWARD 2020 as follows:

No.	Category	Quantity
1	AEROTHAI Driven Innovation Award	4
2	AEROTHAI Value Adding Innovation Award	10

The selected AEROTHAI's innovations were proposed to the National Research Council of Thailand (NRCT) for the Invention Award, including participation in competitions and exhibitions on an international stage. The results can be summarized as follows:

1. The NRCT Invention Award: "Honorable Mention Award" in IT and Communication Science Branch from TopSky ATC Datasets Tool Box.
2. The International Trade Fair-Ideas, Inventions and New Products (iENA 2019): Silver Medal in Basic electronic circuitry Branch and Special Prize (Gold Medal from Ministry of Science and Higher Education of the Russian Federation) from the Selectable Threshold RF Field Strength Protection Device.

In addition, AEROTHAI provided staff and external applicants scholarships to study in prestigious institutions, both in Thailand and abroad from Bachelor Degrees up to Doctoral Degrees in Air Traffic Management, Communications, Navigation & Surveillance Technologies, Information Management and Related Field in Aviation as well as training scholarships especially Safety & Standards, Training Instructors, Strategic Planning, Aviation Law and Aviation Financial. The training will help the staff to work with the new System with safety and efficiency according to international standards. Additionally, the Company also permitted study leave both full-time and part-time for its staff to undertake self-funded further education so as to greater increase the qualifications and quality of personnel for the Company.

Information Technology Development

AEROTHAI, as a state enterprise under the Ministry of Transport, has continued to develop the digital technology of the organization by focusing on creating value added to the mission of the organization, both in the support of information systems for air navigation services (Communications, Navigation and Surveillance/Air Traffic Management: CNS/ATM) and the development of information systems for administrative work (Back-Office). The development can respond to recent Government's policies and guidelines as well as the criteria of State Enterprises Assessment Model (SE-AM) by establishing a digital technology policy, making a digital action plan as a master plan for implementing through various projects and tasks of digital development. This implementation involved cooperation of personnel of all sectors and at all levels as well as initiating digital technology projects and the task to impel the digital policy for promotion of the use of digital technology in organization and transform it to a digital organization that provides the highest quality and sustainable air navigation services.

AEROTHAI's digital technology development in 2020 focused on seven major topics as follows:

1. **Digital Governance:** providing supervision, formulation of standards, practices or rules in order to use appropriate digital technology as well as developing digital action plan and annual action plan in line with the Government's policy of Thailand 4.0 and other relevant laws.
2. **Digital Transformation:** providing digital technology by applied it to all parts of the organization in order to reduce workload by leveraging automation together with effective project management and quality management for example:
   - 2.1 Installed Aerodrome Simulator System at Suvarnabhumi Airport, Don Mueang International Airport and 8 Provincial Air Traffic Control Centres.
   - 2.2 Installed an air traffic control system for remote airport area at Hat Yai Airport.
   - 2.3 Developed Multi-FIR ATFM Phase 2.
   - 2.4 Developed ATC Clearance operating procedures in digital format (Digital Departure Clearance) at Suvarnabhumi Airport and Don Mueang International Airport.
   - 2.5 Developed a SWIM-Enabled Application(s) that integrated weather information and forecast data to support air traffic mobility management.
   - 2.6 Developed a system for designing electronic work schedules (E-Schedule: Electronic Schedule Design).
   - 2.7 Developed an electronic mass transit system (E-Transport: Electronic Transport).
   - 2.8 Developed an information system to support human resources (HRIS).
   - 2.9 Installed a digital document system for sending and receiving paperless document, of which notifications can be signed through a mobile device.
   - 2.10 Developed an engineering maintenance system (E-Maintenance: Electronic Engineering Maintenance).
   - 2.11 Developed an information system to follow up on projects in the part of rental equipment.
   - 2.12 Developed an information service system to measure flight efficiency (Flight Efficiency).
   - 2.13 Developed a website system to provide information for all stakeholders.
3. **Digital Integration:** providing a management of information integration by joint operations linkages between all stakeholders such as
   - 3.1 Providing an Integrated Flight Information Management System (iFIMS) for exchange of flight information between STAT and Airports of Thailand PLC (AOT).
   - 3.2 Developing cooperation in managing and connecting air traffic flow management through the ATFM Platform with ANSP in Asia.
4. **Digital Data Governance and Big Data Management:** providing data management and use of big data in accordance with the principles of Government in Data Governance and Personal Data Protection in order to obtain and use information of organization divisions correctly, completely and up to date with quality, efficiency and security such as:
   - 4.1 Installed Aeronautical Information Management System (AIM).
   - 4.2 Developed an information system in the form of IWXXM version 3.0.

4.3 Installed a central database service system and a data warehouse system (Master Data Service and Data Warehouse) to manage central data for every work system and information support for decision making.

4.4 Developed a Single-Sign-On (SSO) system for providing account management services for operation systems.

4.5 Improved the database system used for data storage.

4.6 Updated the data set for the TopSky Tower System to support the Suvarnabhumi Airport development in Phase 2 and support Runway 3.

5. **Digital Information and Cyber Security:** providing management of information security and cyber security in accordance with international standards and consistent with Thailand's national plan and related laws such as

5.1 Set up a Network Infrastructure and Network Security Operation Centre for surveillance of threats and monitor attacks through the network.

5.2 Installed DHCP (Dynamic Host Configuration Protocol) system for ICT work at Thung Mahamek Headquarters, Suvarnabhumi Airport, Don Mueang International Airport and nine Provincial Air Traffic Control Centres.

5.3 Installed an ICT Network Security System for wired and wireless networks in order to cover all areas throughout the organization.

5.4 Developed a Security Information and Event Management (SIEM) System.

5.5 Developed a Security Management System for information and communication technology systems to pass ISO/IEC 27001 and related Thai Cybersecurity Act.

6. **Digital Continuity Management:** providing the development of digital infrastructure in order to continuously support the organization's operations and improve the business continuity plan as well as alliance digital risk management and emergency response plans with the organization's BCM (Business Continuity Management) plan, such as

6.1 Improved the communication network system (Modern Network Infrastructure) for connecting various systems/devices at four Provincial Air Traffic Control Centres.

6.2 Improved Network Monitor and Management System.

6.3 Developed a System Monitor and Control device to support the work of the Engineering Supervisors.

6.4 Developed a Business Continuity Management System (BCM) for applying for the ISO 22301:2012 certificate.

7. **Digital Resource Optimization Management:** providing management of digital technology resources, both in terms of personnel, process and technology, for maximum benefit and efficiency with reasonable cost and environment friendly as well as developing digital skills for personnel at all levels to be ready and able to use digital technology consistent with Government's policies such as

7.1 Developed or improved computers and other peripherals.

7.2 Installed a digital document system (Salaban) for sending and receiving paperless or notifications can be signed through a mobile device. This also supported the reduction of paper consumption and supported the use of technology in the management of the organization in order to reduce the cost of the organization for managing internal documents.

7.3 Provided computer equipment for replacement of the expired devices to reduce maintenance cost and improve the Information Rental Communication Service (iRCS) system programme.

7.4 Developed knowledge exchange through digital technology, by communicating and publicizing knowledge technological changes and warn of cyber threats, etc., which could affect the digital experience of all employees as well as creating forms of awareness-raising including cyber drills and how to deal with cyber threats appropriately.

Performance on Investment Expenditure

Since the Government has a policy for the state enterprises to set the target for investment expenditure at not less than 95% of the approved budget, in 2020, AEROTHAI's accumulated investment expenditure was Baht 894.43 million which was 93% compared to the approved budget of Baht 961.50 million, which was less than the approved budget at Baht 67.07 million. However, after adjusting the conditions as set by the Ministry of Finances guidelines (for example: the target could be adjusted if the actual expenditure was lower than the approved budget), AEROTHAI's investment expenditure was 100% of the approved budget.

Performance Appraisal

AEROTHAI performance appraisal was done through performance agreement of state enterprise's operation with the Ministry of Finance with State Enterprise Policy Office (SEPO) as regulatory body. The Government recognizes the importance of creating added value to enable State Enterprises to become more efficient, thereby increasing the competitiveness edge of the enterprise and the creation of added value to the property of the State. The State Enterprise Performance Appraisal (SEPA) is a tool which consists of 3 parts: (1) the assessment and evaluation of Systems and Processes for the 6-categories of corporate management (Leadership, Organizational Strategic Planning, Customer and Market Focus, Measurement/Analysis/ Management of Knowledge, Personnel Focus, and Operations Focus) (2) Strategic Mission and (3) the organization's performance results of its operations. AEROTHAI yielded an overall performance appraisal of 4.4319 in the fiscal year 2019.

SEPA's Performance Appraisal	Fiscal Year 2019		
	Process/System	Strategic Mission	Result
Weight	30	20	50
Weighted Result	1.2150	1.000	2.2169
Total		4.4319	

In the fiscal year 2020, SEPO has developed a new performance appraisal system by using the State Enterprise Assessment Model (SE-AM). The outcome of the performance appraisal is still pending.

Company's Credit Rating

In the fiscal year 2020, TRIS Rating Company Limited (TRIS Rating) affirmed the company rating of Aeronautical Radio of Thailand Ltd. (AEROTHAI) at "AAA" with a "Stable" rating outlook. The rating reflects the assessment on AEROTHAI's status as a government-related entity (GRE), integrally linked to the government and the view of an almost certain likelihood that AEROTHAI would receive timely and sufficient support from the Thai Government in the event of financial stress. This also includes the significant role of AEROTHAI in Thailand's aviation industry as the main national Air Navigation Services Provider assigned by the Government with good performance in safety.

The "stable" outlook reflects TRIS Rating's expectation that AEROTHAI will maintain its status as a GRE, integrally linked to the government, and its important role to the Government as the main provider of air navigation services in the Country. A rating downgrade could occur if AEROTHAI's linkage to the Government, or its importance to the Government has changed, to the degree that it changes the view concerning the likelihood of the Government providing timely and sufficient support to the Company in times of financial stress.

Highlighted Activities

Global and Regional Cooperation

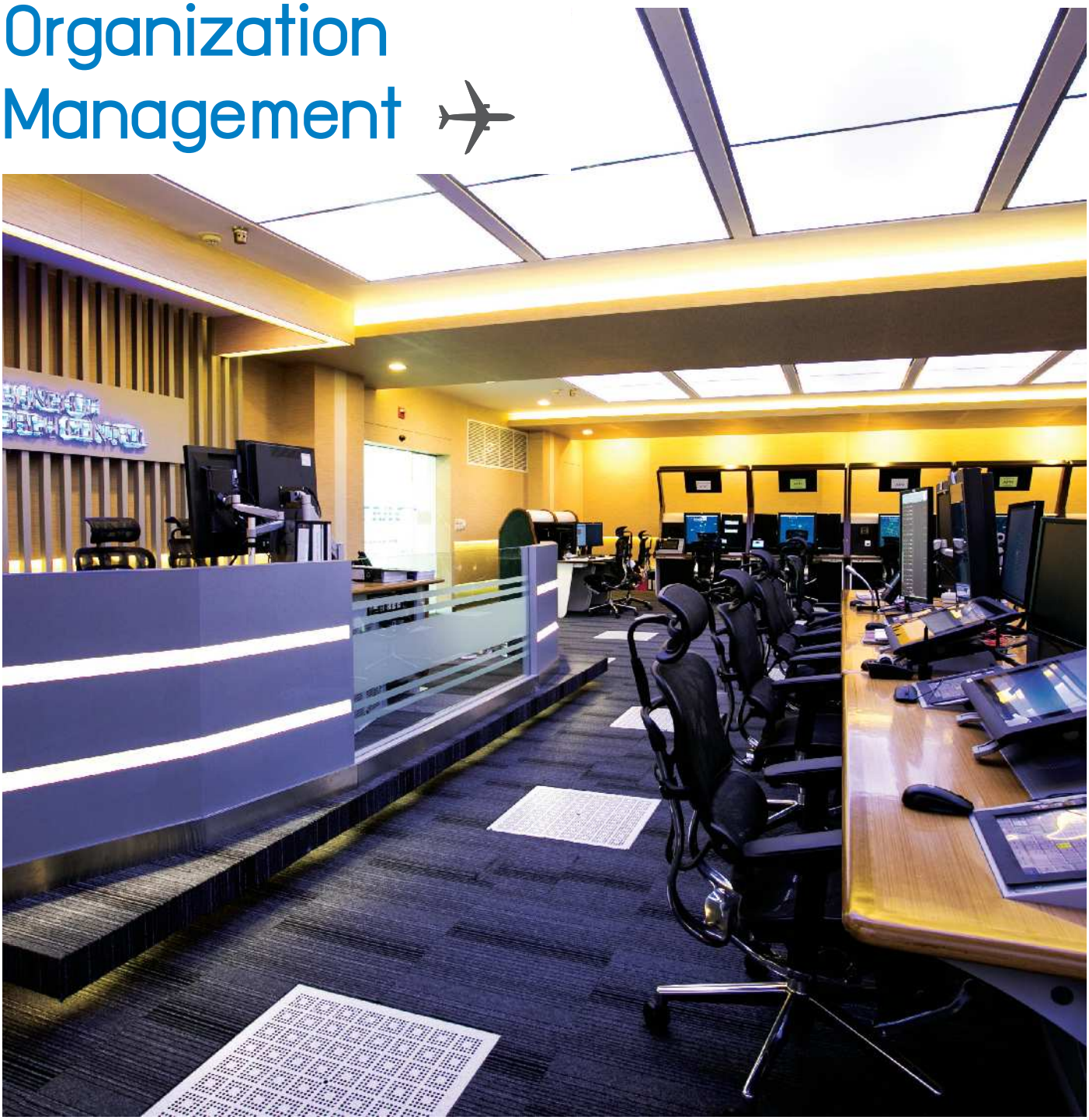
1. **Cross-border Air Traffic Flow Management (Cross-border ATFM)**
    - AEROTHAI has actively supported International Civil Aviation Organization (ICAO) at both global and regional levels. Particularly, AEROTHAI is a member of ICAO Air Traffic Management Operations Panel (ATMOPSP) which is the global body responsible for developing the global ATFM standards and related guidance materials. At the regional level, aiming at continuously pushing forward ATFM implementation in the Asia/Pacific region, under the umbrella of ICAO Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), AEROTHAI keeps contributing to ATFM Steering Group (ATFM SG), especially in developing and maintaining the Asia/Pacific Framework for Collaborative ATFM. Additionally, AEROTHAI plays an important role in Asia/Pacific ATFM Information Requirement Small Working Group (ATFM-IR SWG) tasked to develop both operational and technical specifications with the objective to realize the harmonization of ATFM services and support systems across the ATFM implementation groups in the Asia/Pacific region.
    - AEROTHAI plays the leading role in the Asia/Pacific Cross-Border Multi-Nodal ATFM Collaboration (formerly known as Distributed Multi-Nodal ATFM Network Project) which involves Air Navigation Service Providers (ANSPs) of another 10 States/Administrations in Asia/Pacific region, i.e. Singapore, Hong Kong, Australia, Cambodia, Malaysia, Myanmar, Indonesia, Vietnam, the Philippines, and Lao PDR, as well as airlines and international organizations. This project is one of the collaborative ATFM projects participated by the highest number of aviation stakeholders in the region. Since 2018, AEROTHAI together with participating ANSPs have made a number of achievements, including the operational service provision in various events affecting airport capacity and airspace capacity. Furthermore, with the need for a single-point of information access enabling by the effective information sharing platform among stakeholders, Technical Sub-Group of the project has been thus established and tasked to develop an Interface

Control Document (ICD) that will define the ATFM system-to-system information linkage, while keeping in view the requirements from airspace users and future development towards System-Wide Information Management (SWIM) framework. In 2019-2020, the ICD, which was developed by Technical Sub-Group to provide the technical specifications for cross-border ATFM data exchange using Aeronautical Fixed Telecommunication Network/Air Traffic Service Message Handling System (AFTN/AMHS), so-called the AFTN/AMHS-based ICD, was adopted by the bodies under the APANPIRG and published on the ICAO Asia/Pacific Regional Office website as a technical guidance material for Asia/Pacific States/Administrations in the implementation of cross-border ATFM communication

2. **System-Wide Information Management (SWIM)**
   - Under the cooperation framework between ASEAN and USA, in 2019 AEROTHAI together with Civil Aviation Authority of Singapore (CAAS) successfully led the conduct of the SWIM in ASEAN Demonstration to showcase the operational benefits enabled by SWIM and, importantly, to demonstrate a model of SWIM implementation for ASEAN and Asia/Pacific region. As SWIM is an integral part of ICAO's Global Air Navigation Plan, particularly the ASBUs, and is considered as a crucial building block of Seamless ASEAN Sky and future ATM operational concepts such as Flight and Flow Information for a Collaborative Environment (FF-ICE), Trajectory-Based Operation (TBO), this demonstration was also aimed at providing an opportunity for ASEAN Member States (AMSs) and States/Administrations in Asia/Pacific region to obtain a firsthand experience on SWIM implementation. The scope of this demonstration included ANSPs, meteorological (MET) authority, and airlines from 13 Asia/Pacific States/Administrations as well as International Air Transport Association (IATA). Namely, except AEROTHAI and CAAS who were the co-lead of this demonstration, another 12 ANSPs/MET authority of 11 States/Administrations, i.e. USA, Malaysia, Myanmar, Lao PDR, Cambodia, Indonesia, the Philippines, Vietnam, Hong Kong, Japan, and Australia, took part in the demonstration.
   - AEROTHAI is the active member of ICAO Asia/Pacific SWIM Task Force which is tasked by the APANPIRG to develop SWIM implementation plan and related requirements for the Asia/Pacific region. In 2019, the SWIM implementation framework developed by AEROTHAI, CAAS, and Federal Aviation Administration (FAA) was adopted by the bodies under the APANPIRG to be Philosophy and Roadmap for Asia/Pacific SWIM Implementation. Furthermore, the flight information exchange model (FIXM version 4.1 Extension) developed by AEROTHAI to support the ATFM information exchange for cross-border ATFM operations and ATFM/A-CDM (Airport-Collaborative Decision Making) integration in SWIM environment was adopted by the APANPIRG to be the Asia/Pacific FXIM version 4.1 Extension for use by Asia/Pacific States/Administrations. This Asia/Pacific FIXM Extension was also uploaded to the ICAO Asia/Pacific Regional Office website. Moreover, the Asia/Pacific FIXM Extension was forwarded to the FIXM Change Control Board (CCB) for review and it was published on the FIXM official website (www.fixm.aero) for use by other stakeholders as well.

3. **The Sixth Edition of ICAO Global Air Navigation Plan**
   In 2017–2019, AEROTHAI was one of the members of the ICAO's ASBU Panel Project Team responsible for drafting the sixth edition of ICAO's Global Air Navigation Plan (GANP) which was adopted by the 40th Session of the ICAO Assembly in 2019.

Organization Management



Risk Management and Internal Control

AEROTHAI has implemented Corporate Risk Management (CRM) and Internal Control in accordance with the Risk Management and Internal Control Guidelines and Procedures, 2012 as outlined by the State Enterprise Policy Office (SEPO), the Standards and Guidelines for Internal Control of Government's Agencies, 2018, and the Standards and Guidelines for Risk Management of Government's Agencies, 2019, both of the later set by the Ministry of Finance. The guidelines and procedures are based on the concept developed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In the fiscal year 2020, AEROTHAI has carried out risk management undertakings according to its Risk Management and Internal Control Master Plan 2019-2020 in the following areas:

1. Strategic Risk: AEROTHAI's managed strategic risks by using the target of investment expenditure set out and the accomplishment of projects under its corporate plan. In the area of investment expenditure, there are risks to be managed by project management and accelerating budget disbursements with low risk. Regarding radio frequency interference, there are low risks in radio frequency interference that can be mitigated by using reserved frequencies. Thus, AEROTHAI's strategic risk is relatively low.

2. Operational Risk: Operational risks focuses on the safe and efficient air navigation services, the availability of equipment and systems, and the capability of personnel and manpower. Overall, operational risks is at an acceptable level between low to relatively low; these risks include 1) limitation on personnel capability, 2) the ability of technology/equipment system to support user needs (Communications, Navigation, Surveillance and Data-Network), and 3) imbalance of traffic demand and airspace capacity. Risk management measures need to be monitored and reviewed. Additional measures of short, medium, and long-term may need to be issued for ongoing operational improvements in the fiscal year 2020.

3. Financial Risk: AEROTHAI continuously monitors risks arising from external factors affecting air traffic demand and income. In the fiscal year 2020, air traffic level is lower than projection due to the effect of the COVID-19 pandemic. To mitigate financial risks, AEROTHAI has continually evaluated and monitored the events that might impact its financial status and prepare mitigation measures in all dimensions. As the Company had accumulated income-over-expenditure, AEROTHAI's financial status in 2020 was not affected, however the impact may take its toll in the years 2021-2023. Even though the current financial risk profile is at an acceptable level, AEROTHAI continues to put emphasis on cost control measures in order to create financial liquidity in the future.

4. Compliance Risk: AEROTHAI acts on the good governance concept and related legislations/laws, notably in the following three dimensions:

1. Corporate Governance (CG) - reviewing performance audit results, complaints, and findings related to CG concept;
2. General Legislations/Laws - reviewing litigation and litigation compensation;
3. Aviation laws - reviewing performance audit results, complaints, and findings related to aviation laws.

According to the three risks criteria, the result of risk assessment is at low level.

Business Continuity Management (BCM)

AEROTHAI has implemented Business Continuity Management (BCM) under the Business Continuity Management (BCM) project with the aim to apply for the certification of ISO 22301:2012 standards.

On 3 September 2019, AEROTHAI successfully received the ISO 22301:2012 certificate for the three central ATC Centres (Tung Mahamek, Don Mueang, Suvarnabhumi) under the scope of Air Traffic Services (ATS) and Aeronautical Information Services (AIS) from United Registrar of Systems (Thailand) Limited (URS).

In the fiscal year 2020, AEROTHAI still maintains BCM system standard (The first Surveillance Audit) covering the three central ATC Centres (Tung Mahamek, Don Mueang, Suvarnabhumi).

BOARD OF DIRECTORS

Article 33 of the Company's Articles of Association stipulates that the Company's Board of Directors consists of not less than three Directors and Article 39 stipulates the nomination of Directors by both A and B shareholders as follows:

(1) The Thai Government shall be entitled to nominate Directors of the Company and the Thai Government's nominees shall be appointed Directors. One of these Directors, as nominated by the Thai Government, shall be the Chairman of the Board of Directors of the Company.

(2) The holders of B shares shall be entitled to nominate two Directors and these nominees shall be appointed Directors.

At the ordinary general meeting in every subsequent year, one third of the Directors must retire from office. A retiring Director is eligible for re-election. A Director can be appointed only by a general meeting. If a vacancy occurs in the Board of Directors otherwise than by rotation it may be filled by the remaining Directors, but any person so appointed shall retain his office during such time only as the vacating Director was entitled to retain the same.

THE BOARD OF DIRECTORS IN THE FISCAL YEAR 2020

As of 30 September 2020 in the fiscal year 2020, the Board of Directors consisted of the following 6 Directors:

1. Air Chief Marshal Siwakiat Jayema

Chairman

(Appointed as the Director and Vice Chairman on 30 April 2017 and appointed as Chairman on 24 January 2018)

Age: 63

Position: Retired Officer, Ministry of Defence

Education:

- Armed Forces Academies Preparatory School (Class of 16)
- Royal Thai Air Force Academy School (Class of 23)
- Air Force Staff School (Class of 35)
- Joint War College (Class of 38)
- Master of Business Administration, Kasetsart University

Work Experiences:

- Director of Thai Airways International Public Company Limited
- Acting President, Thai Airways International Public Company Limited
- Deputy Permanent Secretary for Defence
- Assistant Air Command of Staff
- Deputy Chief of Air Staff
- Assistant Chief of Air Staff

Training:

- Diploma, National Defence College (Class of 51), The National Defence Course
- Diploma, Joint State - Private Sector Course (Class of 21), National Defence Studies Institute
- Director Certification Program (DCP) (Class of 227), Thai Institute of Directors Association
- Executive Course (Class of 24), Capital Market Academy
- Political course of government in the monarchy for senior executives (Class of 21)
- Role of the Chairman Program (RCP) (Class of 41), Thai Institute of Directors Association
- Corporate Governance in Digital Era Course, Fiscal Policy Research Institute Foundation
- Corporate Governance for Directors and Senior Executives of Regulator (Class of 19), State Enterprises and Public Organizations of Public Director Institute
- The Executive Program in Energy Literacy for a Sustainable Future (Class of 13), Thailand Energy Academy

Fields of Competence:

- Organization Management
- Transportation and Air Transport
- Security

Other Positions:

- Advisor, Defence Technology Institute

2. Mr. Lavaron Sangsnit

Vice Chairman

(Appointed as the Director on 1 December 2018 and appointed as Vice Chairman on 1 July 2019)

Age: 53

Position: Director General, Fiscal Policy office, Ministry of Finance

Education:

- Bachelor of Economics, Chulalongkorn University
- Master of Economics (Policy and Planning), Northeastern University, USA

Work Experiences:

- Inspector General, Ministry of Finance
- Financial Policy Advisor, Fiscal Policy Office
- Deputy Director-General, Fiscal Policy Office

Training:

- Diploma, National Defence College (Class of 58), The National Defence Course
- Top Executive Program (Class of 25), Capital Market Academy (CMA)
- The Executive Program in Energy Literacy for a Sustainable Future (Class of 12), Thailand Energy Academy

Fields of Competence:

- Organization Management
- Economics and finance

Other Positions:

- Director of Bank of Thailand
- Director of Tobacco Authority of Thailand
- Director of Krung Thai Asset Management Public Company Limited
- Name listed in the Directors' Pool of State Owned Enterprise in Economics, Finance (Financial and Budget)

3. Mr. Puttipong Prasarttong-Osoth

Director

(Appointed on 17 March 2015, resigned on 23 January 2018 and reappointed on 17 April 2018)

Age: 55

Position: Vice Chairman of the Board of Directors/Chief Executive Officer (CEO) and President, Bangkok Airways Public Company Limited

Education:

- Bachelor of Commerce and Accountancy, Chulalongkorn University

Work Experiences:

- Senior Vice President Operations, Bangkok Airways Company Limited
- Vice President Operations, Bangkok Airways Company Limited

Training:

- SASIN Senior Executive Program, SASIN Graduate Institute of Business Administration of Chulalongkorn University
- Diploma, Joint State - Private Sector Course (Class of 24), National Defence Studies Institute (Class of 25)
- The Program for Senior Executives on Justice Administration (Batch 13), Judicial Training Institute
- Certificate of Commercial Pilot Licence
- Director Accreditation Program (DAP) (Class of 100), Thai Institute of Directors Association
- Director Certification Program (DCP) (Class of 241), Thai Institute of Directors Association
- Boards That Make a Difference (BMD) (Class of 9), Thai Institute of Directors Association

Fields of Competence:

- Organization Management
- Transportation and Air Transport

Other Positions:

- Chairman of Bangkok Air Catering Company Limited
- Chairman of Bangkok Air Catering Samui Company Limited
- Chairman of Bangkok Air Catering Phuket Company Limited
- Chairman of Bangkok Air Catering Chiang Mai Company Limited
- Chairman of BAC Gourmet House Company Limited
- Chairman of Gourmet Primo Company Limited
- Chairman of Bangkok International Airport Flight Services Company Limited
- Chairman of Bangkok Airways Ground Services Company Limited
- Chairman of Bangkok Dusit Medical Services Public Company Limited
- Director of WFS-PG Cargo Company Limited
- Director of Sahakol Estate Company Limited
- Director of Bangkok Media and Broadcasting Company Limited
- Director of Fuel Pipeline Transportation Company Limited
- Director of Bangkok Airways Holding Company Limited
- Director of More Than Free Company Limited
- Director of Bangkok Aviation Fuel Services Public Company Limited
- Pilot of Airbus 319/320 fleet, Bangkok Airways Public Company Limited
- Advisor, Bangkok Christian College Alumni Association
- Senior Advisor, Nakorn Ratchasima's Municipality

4. Mrs. Phongsaward Guyaroonsuith

Director

(Appointed on 31 October 2016, resigned and reappointed on 23 January 2019)

Age: 53

Position: • Deputy Secretary-General of the Council of State, Office of the Council of State
• Councillor of State of the 2nd Committee

Education:

- Bachelor of Laws, Thammasat University

Work Experiences:

- Permanent Law Councillor
- Director, Bureau of Administrative Law

Training:

- Executive Development Program (EDP 1) (Class of 82), Office of the Civil Service Commission
- Senior Executive Law Program (Class of 5), Office of the Supreme Court
- Ministry Spokesman Course, Office of the Prime Minister
- Advanced Budget Management Program (Class of 6), Budget Bureau

Fields of Competence:

- Laws

Other Positions:

- Director of Expressway Authority of Thailand
- Name listed in the Directors' Pool of State Owned Enterprise in Politics and Governance (Governance), Laws (Administrative Law) and Security (Security Laws and Government Administration)

5. Professor Dr. Amorn Pimanmas

Director

(Appointed on 23 January 2018)

Age: 47

Position: Professor of Department of Civil Engineering, Kasetsart University

Education:

- Bachelor of Civil Engineering (First Class Honor) Chulalongkorn University
- Master of Civil Engineering, University of Tokyo, Japan
- Master of Management, College of Management, Mahidol University
- Doctor of Civil Engineering, University of Tokyo, Japan

Work Experiences:

- President of Thai Structural Engineers Association
- President of Thai Building Information Modeling Association
- Member of Academic Council, Rajamangala University of Technology Phra Nakhon
- Director of the Mass Rapid Transit Authority of Thailand Honorary
- Director of Thai Technical Volunteer Foundation

Training:

- Director Certification Program (DCP) (Class of 276), Thai Institute of Directors Association
- Risk Management Program for Corporate Leaders (RCL) (Class of 16), Thai Institute of Directors Association
- Strategic Board Master Class (SBM) (Class of 6), Thai Institute of Directors Association
- Financial Statement for Directors (FSD) (Class of 39), Thai Institute of Directors Association

- Advanced Audit Committee Program (AACP) (Class of 34), Thai Institute of Directors Association
- IT Governance and Cyber Resilience Program (ITG) (Class of 13), Thai Institute of Directors Association

Fields of Competence:

- Organization Management
- Civil Engineering
- Data Analysis

Other Positions:

- Name listed in the Directors' Pool of State Owned Enterprise in Transport and Transportation, Engineering and Information technology

6. Mr. Somnuk Rongthong

Director

(Appointed on 26 September 2018, resigned and reappointed on 23 January 2019)

Age: 59

Position: President, Aeronautical Radio of Thailand Limited

Education:

- Bachelor of Electrical Engineering, Kasetsart University

Work Experiences:

- Executive Vice President, Aeronautical Radio of Thailand Limited
- Vice President (Air Traffic Services Engineering), Aeronautical Radio of Thailand Limited

Training:

- Diploma, Joint State - Private Sector Course (Class of 26), National Defence Studies Institute (Class of 56)
- Air War College (Class of 36)
- Advanced Management Program, Wharton School, University of Pennsylvania, USA

Fields of Competence:

- Organization Management
- Engineering
- Information Technology

Other Positions:

- Name listed in the Directors' Pool of State Owned Enterprise in Information technology, Organization Management and Engineering

The Board of Directors had no connected transactions. In addition, they did not hold any shares or held not more than 10 percent of all voting shares of the Company.

ROLES AND RESPONSIBILITY OF BOARD OF DIRECTORS

The Board of Directors set the policies and oversaw the Company's operations. They also played an important part to set up the strategic plan for organization development in accordance with State Enterprise's practices and the Company's vision stated that "A Sustainable Quality Excellent Air Navigation Service Provider". The Board of Directors appointed knowledgeable and experienced Directors to Sub-Committees for screening any necessary matters as follows:

1. The Executive Committee
2. The Audit Committee
3. The Risk Management Committee
4. The Remuneration Committee
5. The Corporate Governance and Corporate Social Responsibility Committee
6. The Legal Committee

The Company scheduled the Board of Directors' meetings in advance throughout the year. The meeting was held at least once a month to oversee and monitor the Company's operations. Extra meetings would be called for if necessary as shown in the Annual Report so that the Directors would carry out their duties appropriately. The meeting invitation letters and agenda in the form of document and information systems of the Boards of Directors were provided to the Board of Directors 5 days prior to the meeting.

The minutes of the meetings were recorded in writing and kept available for Directors and relevant persons to inspect. In addition, the minutes of the Board of Directors' Meetings were submitted to A Shareholders (the Ministry of Finance and the Ministry of Transport) and summary of the minutes distributed to B Shareholders (Member Airlines) for acknowledgement and also available on website for shareholders.

The Evaluation of Board of Directors

To be in line with the Good Corporate Governance practice, the Board of Directors did their evaluation to monitor themselves for better performing their duties. This evaluation also assisted them in setting the Company's direction and supervising the management properly. The evaluation was conducted every six months and in the fiscal year 2020, the evaluation form of the committee has been improved to be suitable for the current performance of the Board of Directors and to have guidelines in line with the New State Enterprise Performance Assessment Manual for the year 2020 of the State Enterprise Policy Office. There are 2 forms:

1. The Self Assessment according to good practice has given importance to the six assessment criteria: 1) outstanding in knowledge and ability 2) independence 3) mission preparedness 4) attention to duties and responsibilities 5) performance of duties in the committee and 6) vision of creating added value to the business in the long run. Which the assessment results are at an excellent level.
2. The Board Evaluation consists of six topics: 1) Structure and qualifications of the committee 2) Roles, duties and responsibilities of the committee 3) Committee practice 4) Committee communication 5) Committee relationship with the management and 6) preparation and conduct of meetings. Which the assessment results are at an excellent level.

Which can summarize the assessment results as follows:

Category of Evaluation	First Evaluation (October 2019 – March 2020)		Second Evaluation (April – September 2020)	
	Point	Level	Point	Level
Self Assessment	148.50	Excellent	148.80	Excellent
Board Evaluation	179.00	Excellent	178.80	Excellent

The Board of Directors' Knowledge and Skills Development

The Company realized the importance of the Board of Directors' competency development, which contributed to the Company highest efficiency and productivity as well as being in line with the Good Corporate Governance practices. The Board of Directors participated in training and seminars on courses related to role and function organized by the Thai Institute of Directors Association. In addition, The Boards of Directors has continuously participated in the Company's activities, for example: Corporate Social Responsibility (CSR), site visits to the Air Traffic Control Centres for better understanding of the Company's functions. The Board of Directors also made overseas familiarization trips to observe aviation related operations in order to gain experiences for the benefits of air navigation services provision to accommodate new technology and the increase of flight volume in the future.

The Orientation for the New Directors

The Company organizes an orientation for the Company's directors. Newly appointed and present corporate information and lectures that are beneficial to the performance of duties of the Company's directors. And guided tour of the company's main mission the information presented to the directors is as follows:

1. The Company's information consisting of the booklet of the Company's memorandum of association, general information (Company's background and status, shareholders, policies, vision, values, responsibilities in air navigation services and business units), organization chart, personnel, air transport situation and the Company's performance and financial statements, Corporate Plan, significant projects.
2. Board of Directors' handbook consisting of the names of the Board of Directors and its composition, their authorization and duties, terms, Board meeting and its allowances, Sub-Committee and their authorization and duties, information of independent directors, the evaluation, the application to be member airlines, agreement between the Ministry of Transport and the Company, the asset account submission under the Organic Act on Anti-Corruption B.E. 2561 and relevant laws, regulations and the Acts including a booklet of information system application for the Board of Directors.
3. The Board of Directors and Sub-Committee appointment letters.

Connected Transactions of the Board of Directors with the Company

In the fiscal year 2020, the Company reported that the Board of Directors had no connected transactions as well as not holding any shares in any companies or holding stocks (shares) in the proportion of equal to or more than 10% of the total voting shares of the Company.

As for the procurement/hiring contracts with the Company at the amount of over Baht 100 million, there were no contractors that were associated with the Board of Directors either as the Management or shareholders.

AUTHORIZED DIRECTORS

In the fiscal year 2020, Authorized Director of the Company, included 4 Authorized Directors, two out of the following four Authorized Directors could co-sign and affix the Company seal to bind the Company as follows:

1. Air Chief Marshal Siwakiat Jayema
2. Mr. Lavaron Sangsnit
3. Mr. Puttipong Prasarttong-Osoth
4. Mr. Somnuk Rongthong

THE SECRETARY TO THE BOARD OF DIRECTORS

In the fiscal year 2020, members of the Secretary to Board of Directors were as follows:

1.	Mr. Somnuk	Rongthong	Secretary President
2.	Mr. Tinnagorn	Choowong	Assistant Secretary Executive Vice President (Operations)
3.	Mr. Sukluer	Chiawarcheep	Assistant Secretary Executive Vice President (Policy and Human Resources)
4.	Mrs. Thaniya	Suntharasantic	Assistant Secretary Vice President (Office of the President)

The Board of Directors' Attendance

In the fiscal year 2020, the Board of Directors held 14 meetings with attendance details as follows:

Name		Number of Attendances
Air Chief Marshal Siwakiat	Jayema[1/]	14/14
Mr. Lavaron	Sangsnit[2/]	14/14
Mr. Puttipong	Prasarttong-Osoth[3/]	13/14
Mrs. Phongsaward	Guyaroonsuith[4/]	13/14
Professor Dr. Amorn	Pimanmas[5/]	14/14
Mr. Somnuk	Rongthong[6/]	14/14

(The absent attendants were due to other engagement)

Remarks:

1/ Appointed as the Director and Vice Chairman on 30 April 2017 and appointed as Chairman on 24 January 2018

2/ Appointed as the Director on 1 December 2018 and appointed as Vice Chairman on 1 July 2019

3/ Appointed on 17 March 2015, resigned on 23 January 2018 and reappointed on 17 April 2018

4/ Appointed on 31 October 2016, resigned and reappointed on 23 January 2019

5/ Appointed on 23 January 2019

6/ Appointed on 26 September 2018, resigned and reappointed on 23 January 2019

The Executive Committee

The Executive Committee consisted of not less than three members and not more than five members. In the fiscal year 2020, the Executive Committee consisted of:

1.	Mr. Lavaron	Sangsnit	Chairman
2.	Mr. Puttipong	Prasarttong-Osoth	Member
3.	Mrs. Phongsaward	Guyaroonsuith	Member
4.	Mr. Somnuk	Rongthong	Member and Secretary
5.	Mr. Tinnagorn	Choowong	Assistant Secretary
6.	Mr. Sukluer	Chiawarcheep	Assistant Secretary
7.	Mrs. Thaniya	Suntharasantic	Assistant Secretary

Responsibilities

The Executive Committee was appointed according to Article 42 fourth paragraph of the Company's Articles of Association which stipulates that "In order to facilitate and expedite the conduct of the Company and to supervise the management of the Company more closely the Board of Directors shall set up an Executive Committee of not less than three nor more than five persons".

The Executive Committee's Attendance

In the fiscal year 2020, the Executive Committee held 12 meetings with attendance details as follows:

Name		Number of Attendances
Mr. Lavaron	Sangsnit	12/12
Mr. Puttipong	Prasarttong-Osoth	11/12
Mrs. Phongsaward	Guyaroonsuith	6/12
Mr. Somnuk	Rongthong	12/12

(The absent attendants were due to other engagement.)

The Corporate Governance and Corporate Social Responsibility Committee

In the fiscal year 2020, the Corporate Governance and Corporate Social Responsibility Committee consisted of:

1.	Air Chief Marshal Siwakiat	Jayema	Chairman
2.	Mr. Lavaron	Sangsnit	Member
3.	Mr. Puttipong	Prasarttong-Osoth	Member
4.	Mrs. Phongsaward	Guyaroonsuith	Member
5.	Professor Dr. Amorn	Pimanmas[5/]	Member
6.	Mr. Somnuk	Rongthong	Member
7.	Vice President (Office of the President)		Secretary
8.	Mr. Marnoch	Sawatdee	Assistant Secretary

Responsibilities

To set the Corporate Governance and Corporate Social Responsibility policy and practices, pre-consider and give the suggestion, report on compliance with the Corporate Governance and Corporate Social Responsibility Plan including monitoring and evaluating the Corporate Governance and Corporate Social Responsibility practices.

The Legal Committee

In the fiscal year 2020, the Legal Committee consisted of:

1.	Mrs. Phongsaward	Guyaroonsuith	Chairman
2.	Miss Chunhachit	Sungmai	Member
3.	Miss Nathsinee	Yuttidhammadamrong	Member
4.	Mr. Somnuk	Rongthong	Member
5.	Dr. Abhijai	Chandrasen	Legal Advisor
6.	Vice President (Office of the President)		Secretary
7.	Senior Director, General Administration Bureau		Assistant Secretary

Responsibilities

To consider and give suggestion regarding Laws, regulations and contract as requested by the Company or assigned by the Board of Directors.

In the fiscal year 2020, there was no appointment Audit Committee, Risk Management Committee and Remuneration Committee. Since there are only 6 Directors from a total of 11 Directors, the number of qualified members is insufficient. Therefore, such committee could not be appointed.

The Independent Directors

In the fiscal year 2020, the list of independent directors has not yet been announced. Because the directors who have qualifications as independent directors has not reached the specified amount.

The Independent Directors have performed their duty in line with a principle of "Independence" which is defined as "a key to foster the Directors' responsibilities. A certain number of the Independent Directors should be comprised of the Board of Directors and they can make suggestions or reports with consideration of their duties and responsibilities independently and justly without direct or indirect benefits or advantages in that case and without considering any benefits relating to properties or positions. In addition, the Independent Directors are not under any influence from people, groups or situations that would result in the Company and shareholders incurring damage or loss of appropriate benefits due to act or omission of act."

Remuneration Rate for the Board of Directors and Committees

The Company is a state enterprise that has to abide by the Cabinet's resolution regarding remuneration of the Board of Directors, which includes a fixed amount of remuneration, meeting remuneration, etc. as set by the Ministry of Finance.

Remuneration Rate for the Board of Directors and Committees Divided into Groups in the fiscal year 2020.

No.	Committee	Total (Baht)
1	The Board of Directors	840,000.00
2	The Executive Committee	560,000.00
3	The Corporate Governance and Corporate Social Responsibility	690,000.00
4	The Legal Committee	212,000.00
	Total	2,302,000.00

Remuneration Rate for the Board of Directors and Committees Divided individually in the fiscal year 2020

No.	Committee		Total (Baht)
1	Air Chief Marshal Siwakiat	Jayema	690,000.00
2	Mr. Lavaron	Sangsnit	635,000.00
3	Mr. Puttipong	Prasarttong-Osoth	570,000.00
4	Mrs. Phongsaward	Guyaroonsuith	565,000.00
5	Professor Dr. Amorn	Pimanmas	480,000.00
6	Mr. Somnuk	Rongthong	600,000.00
7	Ms. Nathsinee	Yuttidhammadamrong	39,000.00
8	Ms. Chunhachit	Sungmai	39,000.00
	Total		3,618,000.00

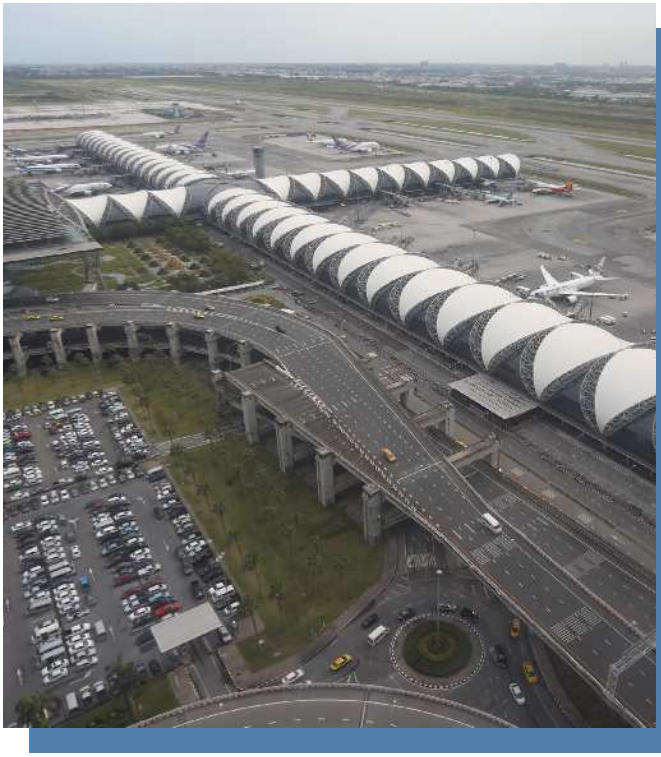
The Labour Relations Committee

In the fiscal year 2020, (October 2019 - September 2020), there were 14 meetings with attendance details as follows:

				Number of Meeting
1.	Mr. Somnuk	Rongthong	Chairman	14
2.	Mr. Sukluer	Chiawarcheep	Member (Employer)	13
3.	Mrs. Sirikes	Niemloy	Member (Employer)	13
4.	Mr. Channarong	Chuacharoen	Member (Employer)	12
5.	Mr. Chamnan	Ruechai	Member (Employer)	12
6.	Mrs. Chidkamol	Soonthornsit	Member (Employer)	14
7.	Mrs. Thaniya	Suntharasantic	Member (Employer)	12
8.	Mr. Chana	Tadtasai	Member (Employer)	14
9.	Mr. Niwat	Lekdee	Member (Employer)	1
10.	Mrs. Kleawthong	Lapthananon	Member (Employer)	14
11.	Mrs. Pornwalai	Visalteerakorn	Member and Secretary	14
12.	Mr. Matee	Khamhaeng	Member (Employee)	14
13.	Mrs. Kasamaporn	Sawatdichai	Member (Employee)	9
14.	Mr. Nirut	Puttstit	Member (Employee)	14
15.	Mr. Kant	Teekanuntaporn	Member (Employee)	11
16.	Mr. Ulan	Siribunyarit	Member (Employee)	13
17.	FS1 Chaiyant	Changrangkarn	Member (Employee)	3
18.	Mr. Akasak	Phothong	Member (Employee)	14
19.	Mr. Sudkhate	Wiengsri	Member (Employee)	14
20.	Mr. Sangsit	Prasomtong	Member (Employee)	12
21.	Mr. Sapol	Singhadara	Member (Employee)	12

Remarks:

1. AEROTHAI replaced Management member Order 9 and Order 11, Effectively on October 30, 2019
2. Union member Order 20 got appointed on February 27, 2020
3. AEROTHAI replaced Management member Order 14 with Order 18, Effectively on May 27, 2020



President's Compensation and Benefits

The President's Remuneration Committee, consisting of AEROTHAI board members and a representative of State Enterprise Policy Office (SEPO), sets the President's Compensation and Benefits as well as the President's annual performance evaluation criteria based on the Thai cabinet resolution on June 13, 2000 and June 22, 2004. The President's Remuneration Committee will propose the President's Compensation and Benefits along with a draft of the President's employment contract to AEROTHAI Board Committee and Ministry of Finance for a final approval.

Annually, AEROTHAI Board Committee evaluates the President's performance according to the performance criteria and evaluation methods set at the beginning of each year. The President's three main key performance indicators (KPIs) consist of 1) projects supporting AEROTHAI's strategies, 2) projects in addition to President's strategic annual plan, and 3) President's leadership.

AEROTHAI Management's Compensation

AEROTHAI set the salary structure for our employees and contracted staff based on the leading organizations' pay rates and compensation surveys whose responsibilities are comparable.

For our management and employees' semi-annual performance evaluation and salary adjustment, the Remuneration Committee evaluates each individual's work performance compared to his/her annual job assignment and the bureau's goal expectations.

Fiscal Year	Number (person)	Salary and Other Income (million baht)
2018	5	37.25
2019	6	44.62
2020	6	39.98

As of September 30, 2020

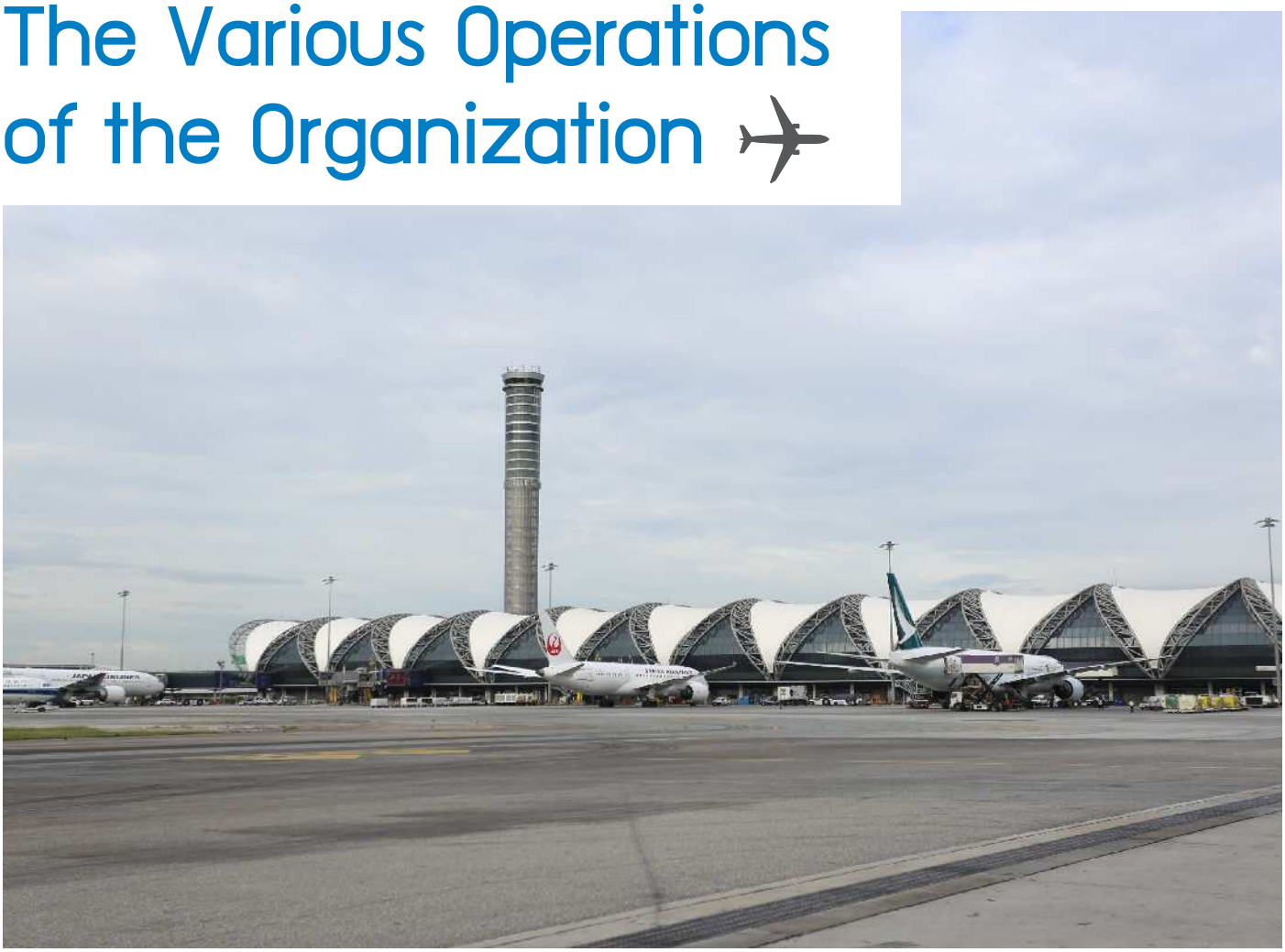
Remarks:

1. Other compensations for AEROTHAI top executives include position allowance, license allowance, lump sum payment instead of car provision, annual special allowance
2. Annual special allowace was paid in October 2019

Conflict of Interest Policy

In the fiscal year 2020, AEROTHAI has continued Guidelines on Appropriate Internal Control Measures for Juristic Persons to Prevent Bribery of State Officials, Foreign Public Officials and Agents of Public International Organizations of NACC's announcement. By definition Ways to Prevent Bribery by the Management and Staff who have a duty to comply with the National Anti-Corruption Law, giving or receiving bribes, risk analysis was rated a very Low risk in conflict of interests Leading to Appropriate Internal Control in five Guidelines such as conflict of interest annual report, conflict of interest seminars, promotion of conduct to be followed according to the Code of Ethics, conflict of interest complaint management and disclosure of Management and Staff's wrongdoing on AEROTHAI's Website.

The Various Operations of the Organization



Operation Report of Sustainable Development (Corporate Governance: CG) 2020

Corporate Governance for AEROTHAI's sustainable development

The corporate governance for AEROTHAI's sustainable development is supervised by the Committee of Corporate Governance and Corporate Social Responsibility. The Committee's responsibilities consist of both identifying corporate governance and social responsibility policy and recommending management in 2019 SEPO's principles and guidelines on corporate governance for State-Owned Enterprise in accordance with the corporate strategy of AEROTHAI's Master Plan (2020-2024) deployment.

The Corporate Governance and Corporate Social Responsibility Committee

The Committee's authorizations are as follows: imposing policy and guidelines on corporate governance and corporate social responsibility, considering, recommending and monitoring corporate governance plan in accordance with Master Plan of corporate social responsibility. In addition, the Committee monitors and assesses the performance of corporate governance and social responsibility.

AEROTHAI's Policy on Corporate Governance and Social Responsibility

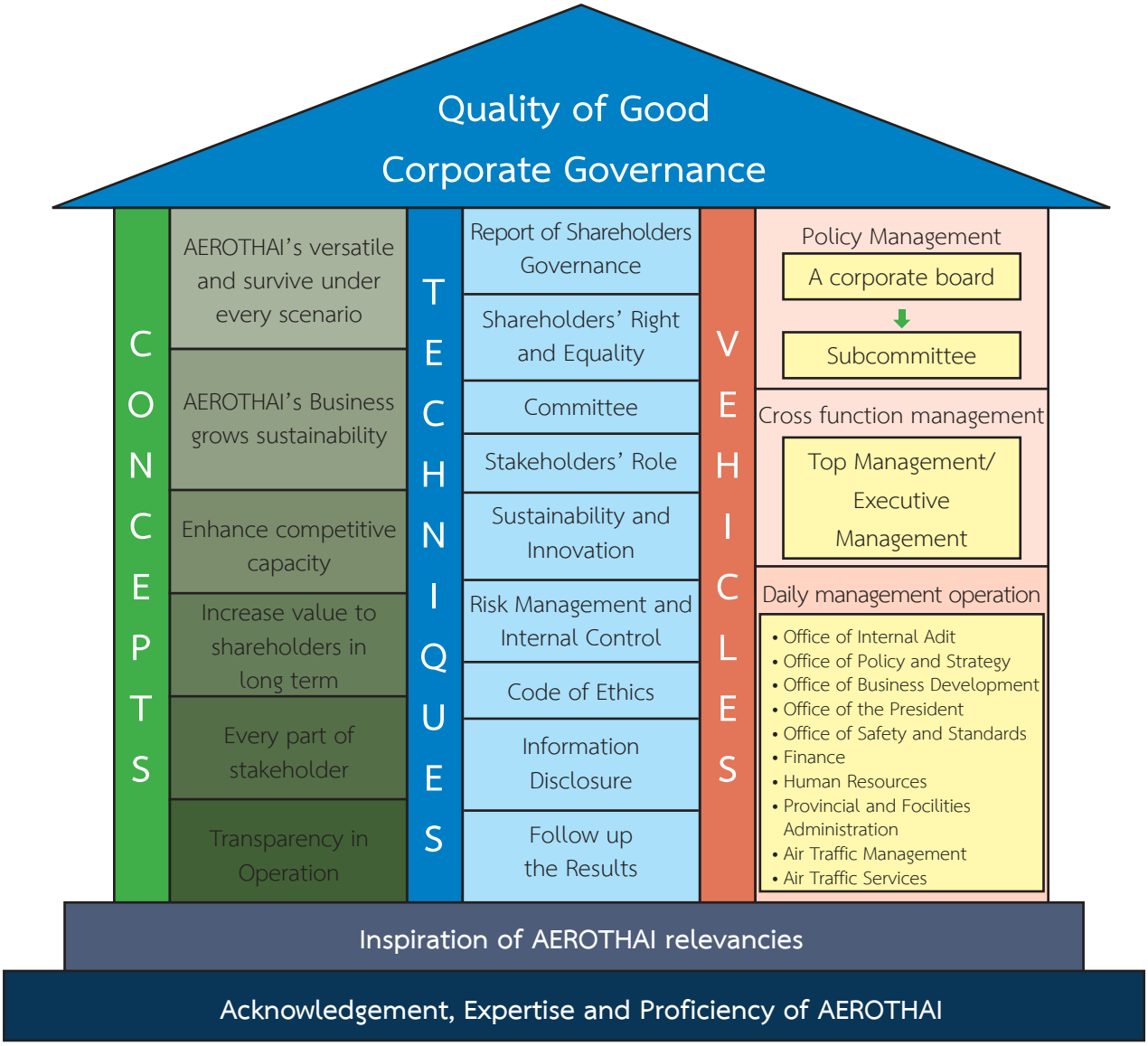
Aeronautical Radio of Thailand Ltd. strictly adheres to administration under principles and guidelines on corporate governance with international standards while realizing the sustainable air navigation services and air traffic services as well as national interests.

The Organization of Corporate Governance for AEROTHAI's Sustainable Development

Adhering to good corporate governance, 2019 SEPO's principles and guidelines on corporate governance for State-Owned Enterprise, AEROTHAI establishes the qualified Corporate Governance Structure as a guideline as follows:

Governance Outcome

1. Competitiveness and performance with long-term perspective
2. Ethical and responsible business
3. Good corporate citizenship
4. Corporate resilience



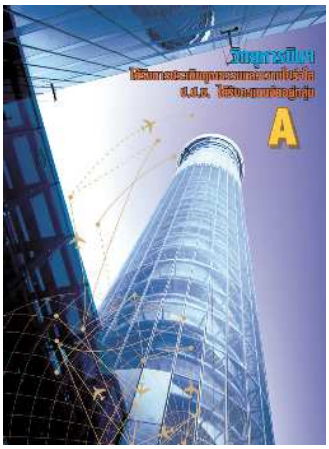
In compliance with the 2019 SEPO's principles and guidelines of corporate governance, the corporate governance structure provides top executives for policy management functioning as the Board of Directors and Committees which impose policy and direction of administration with cross functional management. TM/EM; Top Management/Executive Management Meeting's responsibility consist of implementing corporate governance policy and reporting the impact to the corporate board through daily management. Office of Internal Audit, Office of Policy and Strategy, Office of Business Development, Office of the President, Office of Safety and Standards, Finance, Human Resources, Provincial and Facilities Administration, Air Traffic Management and Air Traffic Services Engineering are the leaders in standard and criteria in corporate governance and leadership implementation as well as the coordinators with every part of organization in driving master plan for corporate governance and social responsibility. Furthermore, the outcome are integrated to increase corporate operation transparently with long-term value increasing to shareholders dependent on every sector of stakeholders through competitive capacity and sustainable development with agility.

AEROTHAI's Anti-Corruption

AEROTHAI drafted an Operation Plan for anti-corruption in line with the National Anti-Corruption Strategy and set criteria for corruption prevention as follows:

1. Publicize the information
2. Convince stakeholders to participate in the operations
3. Strengthen the transparency in procurement
4. Handle complaints of corruption
5. Prevent bribery
6. Prevent conflicts of interest
7. Monitor discretion
8. Promotion of internal and external communications

The Company enhanced the cultivation of employees' awareness of moral ethic and Integrity as well as encouraged operation-working climate focusing on organizational value implied to establish Moral Promotion Centre. Moreover, the Company also enhanced the coordination and cooperation in prevention and suppressing of corruption with external agencies like the National Counter Corruption Commission, Bureau of Corruption Suppression in State Enterprise, State Enterprise Policy Office, Ministry of Transport, State Enterprise organizations and other public sectors through participating in other activities. The Example are 2020 Idol Model of Ministry of Transport, 2020 Anti-Corruption Day, 2020 Declaration of Intent of Morality Organization, 2020 Volunteer Spirit of Ministry of Transport.



Assessment of Integrity and Transparency of AEROTHAI's Operations

Integrity and transparency of AEROTHAI's operations is assessed by the National Counter Corruption Commission with excellent score level for 6 years. The Company has accelerated an integrity and transparency operation for sustainable conveyance. In 2014 AEROTHAI improved handling complaints systematically. In 2015 the knowledge transfer of anti-corruption was set throughout the corporate. In 2016 AEROTHAI supported integrity in Human Resource Management. In 2017 it constructed the procedure of check and balance for independent agencies. In 2018 AEROTHAI increased the channel of communications and public promotion in integrity and transparency throughout every target. In 2019 it established the system of integrity and transparency management by assigning ITA Ambassador to communicate Integrity and Transparency Assessment with every stakeholder. ITA Administration functioned as the monitor of the whole ITA Assessment completely and In 2020 it established the system of integrity and transparency publication on internal and external AEROTHAI website completely. ITA Approver represents the top management's responsibility in ITA Assessment to drive Integrity and Transparency operation sustainably.

The Acceleration of AEROTHAI's Moral Organization Sustainably

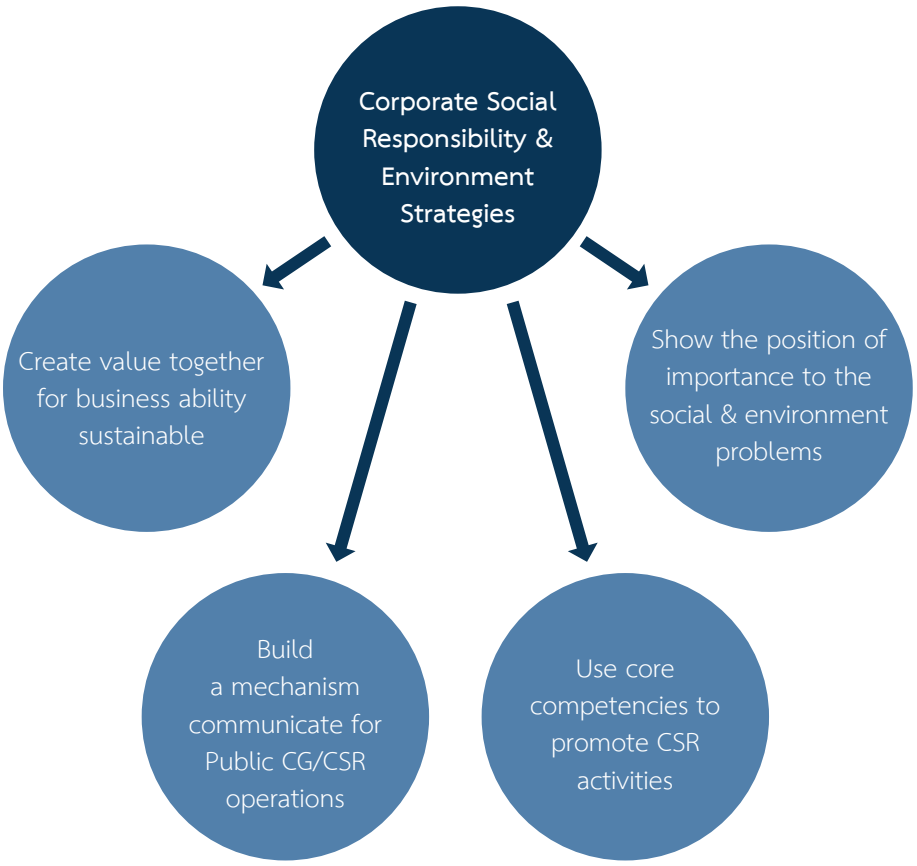
AEROTHAI set guidelines of accelerating moral organization throughout the corporate under the acceleration plan of Integrity Promotion conforming with Ministry of Culture's framework in promoting and improving of moral organization. The Company's culture dimension is used to produce social value and increase the national economic value.

The Company aligned the organization's operations to be moral organization by imposing the promotion and development working plan according to the model of the Ministry of Culture's moral organization under the National Master Plan in Moral Promotion Issue 1 (2016-2021), by including it in the Company's Corporate Plan, 2020-2024. The framework and implementation of promotion and development of moral organization can be divided into 3 phases. The first phase in 2020, operations lead to Moral Promotion Organization, the second phase in 2021, operations lead to be Moral Organization and the third phase in 2022, operations lead to the sustainable Moral Model Organization.

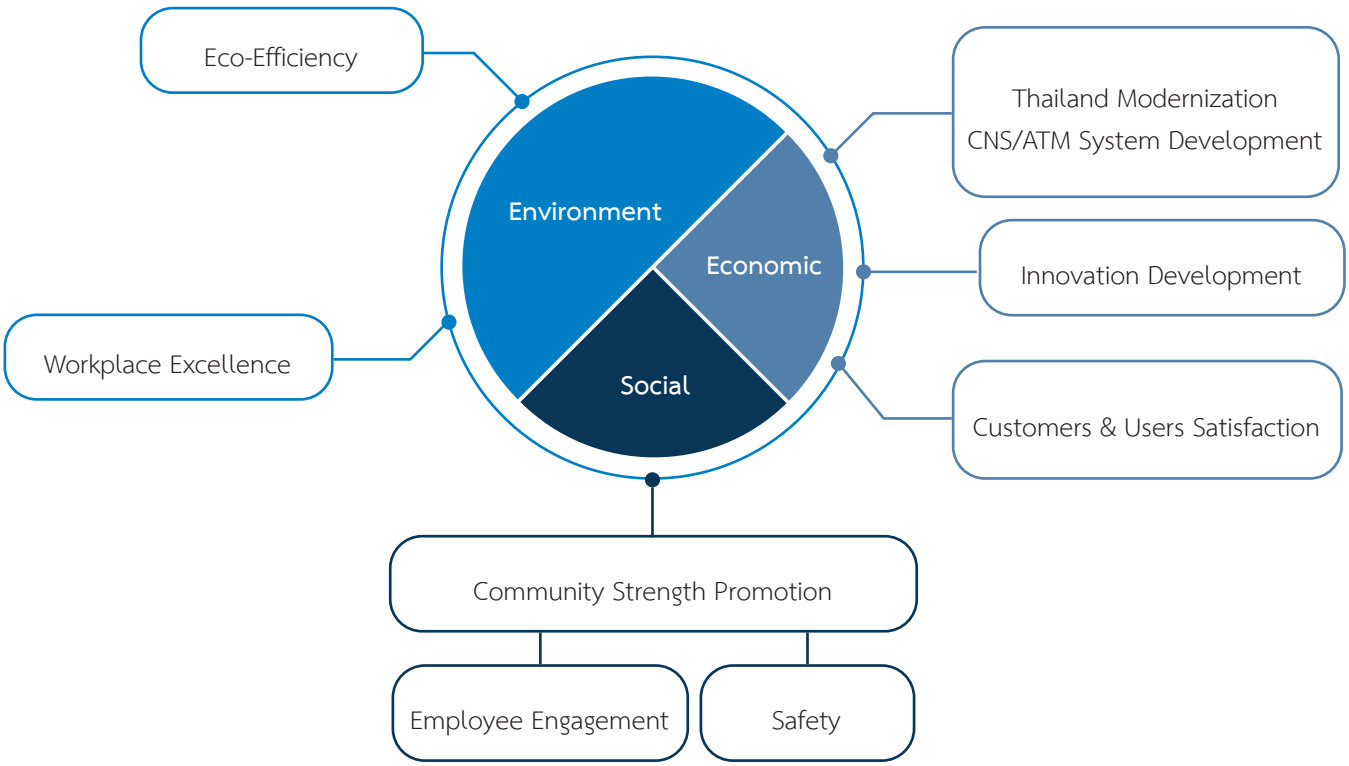
Report of Sustainable Development in 2020

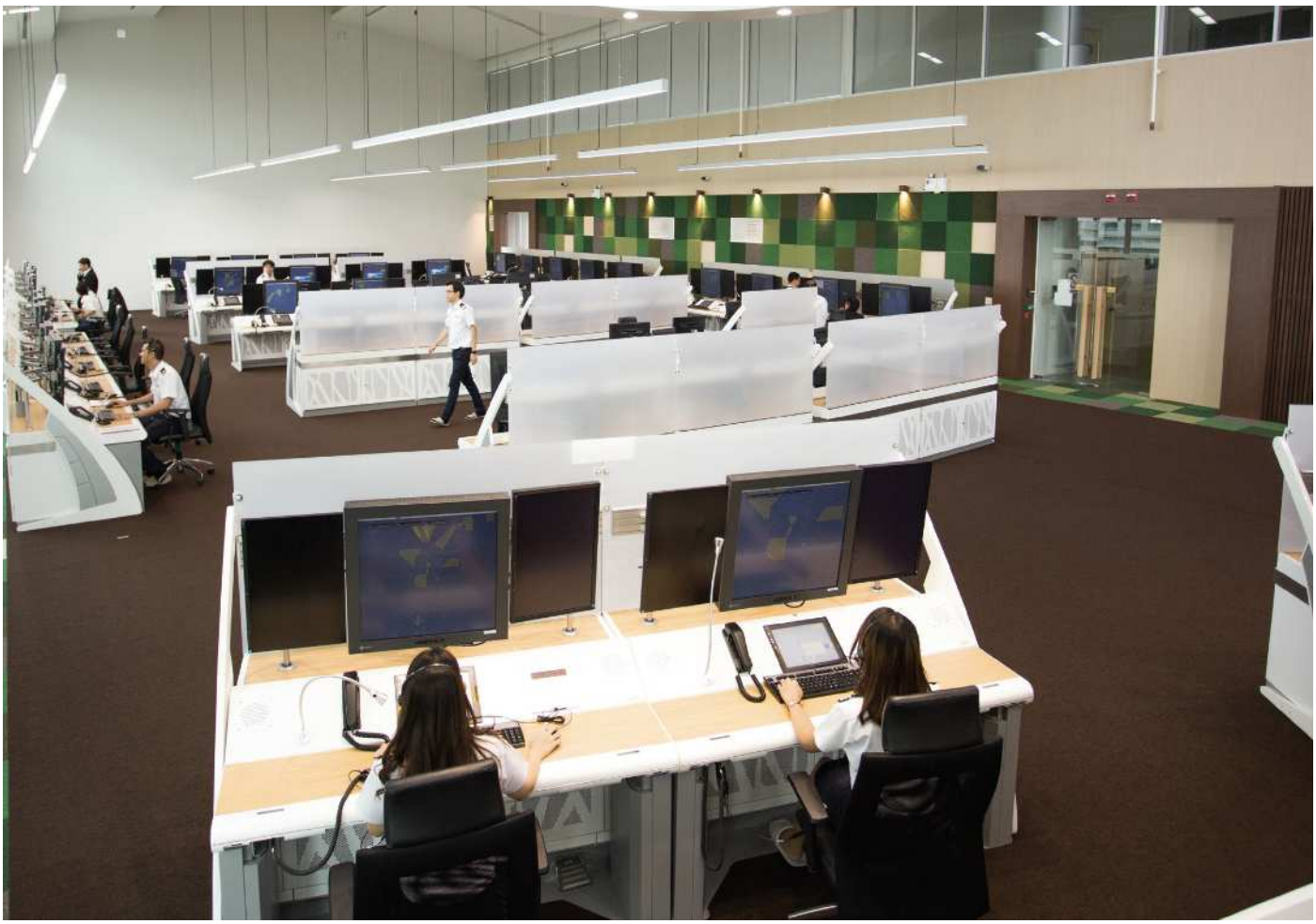
AEROTHAI Sustainable Development

Sustainable Development Policy: "Aeronautical Radio of Thailand Limited administers its functions to enhance service quality in providing air navigation services and other related services as assigned in order to promote balance of the sustainable economic, social and environmental development." The objective of this policy is to stimulate awareness of sustainable development towards society by promoting co-operation, unity and stakeholders' responsibility consciousness covering economics, society and environment under the Social and Environmental Responsibilities Master Plan as the Company's core process. This is concurrently implemented with promotion of acceptance of reliabilities and trust from all groups of stakeholders in line with the Strategy and Corporate Governance and Corporate Social Responsibility Policy by the Corporate Governance and Corporate Social Responsibility Committee and the Company's Management.



In the fiscal year 2020, the Company implemented CSR in Process under the Master Plan by ranking sustainable development in line with the Global Reporting Initiative, GRI Standards Issue and Sustainability Development. There were 8 major issues as follows:





Operations Development for Economic Sustainability

Thailand Modernization CNS/ATM System

Since 2017, the Company has emphasized the preparation to accommodate the rapid growth of aviation industry. It aimed to develop the capacity of the air navigation service system both of air traffic management and air traffic engineering which were the major factors to support economic growth, tourist industry and the Country's logistic system. In the fiscal year 2020, Thailand Modernization CNS/ATM Systems (TMCS) was installed and commissioned throughout the Country with the following objectives:

1. Increase the capacity to accommodate the increase of flight volume.
2. Increase the efficiency and safety of the provision of air navigation service.
3. Increase the role as the hub of air transportation and air navigation in the ASEAN Region.

TMCS is the air transportation infrastructure that increases the efficiency and safety of the provision of air navigation service with new technology and operation procedures. It is comprised of 2 main systems which are TOPSKY ATC and TOPSKY TOWER. It increases flight safety with automatic alert system. The System has been developed to efficiently link with all units in the Country and other countries. In addition, Ground-based technology has been changed to Satellite-based technology to reach the capacity according to the new Global Air Navigation Plan which includes Air Traffic Management System (ATM), Voice Communication Control System (VCCS), Digital Video Recorder (DVR) as well as Uninterruptible Power Supply (UPS). All units in the Country are efficiently connected including those in Tung Mahamek, Chiang Mai, Hat Yai, Phuket, Phitsanulok and all control towers to accommodate the growth of air traffic volume in all areas. The services have been changed from Semi-Automation to Fully Automation with the capacity to accommodate the Country's air traffic volume and competitiveness in the next 7-10 years.

Innovation Development

Promote innovation culture by encouraging the Company's employees to conduct research and innovation development to create innovation to support the Company's operations of air navigation services, aviation engineering and organization management.

The Company put emphasis on the development of innovations in all aspects to improve the air navigation services (core business) and related services as well as organization management. It assigned specific units to take responsibility of the research and development in the organization structure. The Company has a policy to promote research, development and innovation with various intense promotion guidelines. Since 2006, the Company's employees have been encouraged to enter their innovations for competitions to win innovation awards. High level management have participated by being members of the Promotion of Research, Development and Innovation Committee and Sub-Committee with continued budget allocation. Furthermore, experts from other organizations have been invited to be advisers to the Committee. Those experts are knowledgeable, competent, highly-skilled and being recognized of their specific expertise at the national level. They provide advice for the implementation of the research, development and innovation for the benefits of the Company's functions and the Country's aviation industry so that the promotion of innovations will be systematically and sustainably developed.

In addition, it is clearly set in the goal of the Corporate Plan to push for creation of innovations and concrete plans have been drafted to promote innovations. The implementation has been integrated with plans of related Departments to push for organization innovations by the Departments responsible for human resources continuing to arrange for knowledge management. Furthermore, guidelines for promotion of research, development and innovations have been drafted by recapping from organization strategy and policy. Plans/projects and activities have been systematically set with integration of innovations with working systems/plans of the Company. Alliance has been formed with other organizations. This shows the cycle of the Company's continuous development of innovations. In the fiscal year 2020, the Company selected certain innovations to enter competitions in the organization and at national and international levels.

AEROTHAI's Innovations that won National/International Awards in 2020

National Research Council of Thailand's Award

Toolbox, TopSky-ATC Datasets received award in the IT Technology and Communication Science Category, Inventions for the fiscal year 2020. AEROTHAI has procured a new air traffic management system under the Thailand Modernization CNS/ATM Systems (TMCS) Project. In order that the TMCS can operate accurately according to ICAO's standards and correspond to the work of air traffic controllers, datasets are needed. It takes a lot of procedures and time to modify datasets of all units nationwide and errors may occur during the process. The Air Traffic Surveillance Systems Engineering Department has solved the problem by compiling Bash Shell Scripts or Datasets Toolbox to facilitate the procedures, reduce time consuming and errors.

Award from the International Trade Fair-Ideas, Inventions and New Products (iENA 2019), Nuremberg, Federal Republic of Germany.

The Selectable Threshold Voice Delay Measurement received 2 awards, Basic Electronic Circuitry and Special Prize, gold medal, from the Ministry of Science and Higher Education of the Russian Federation. This equipment has been developed to prevent damages to the radio frequency receivers causing by too high RF field strength from transmitters. When the transmitters send out radio frequency, spurious frequency often occurs which causes damages or reduces sensibility for the signal receiving of the monitoring equipment. This equipment can prevent the monitoring equipment by measuring the RF field strength for radio frequency receivers and select threshold value for bypassing signal suitable for each equipment.

AEROTHAI Innovations Competition in 2020: There were 14 innovations selected as follows:

Innovation Category	Prize
Innovations that motivate organization's performance (4 innovations)	
1. Intelligent Departure Enhancement Program (IDEP), Suvarnabhumi Airport and Don Mueang International Airport	First Gold
2. Electronic Ground Planning Board (E-GND Planning Board)	Second Gold
3. MSAW Elevation Profile	First Silver
4. Thai Civil Military Air Traffic Management Coordination System	Second Silver
Innovations that increase organization's value (10 innovations)	
5. Minimal Commands for TopSky-ATC	First Gold
6. The TopSky Tools (Just one click anytime to check status)	Second Gold
7. Video Recording Equipment for Air Traffic Service Surveillance System	First Silver
8. The Selectable Threshold Voice Delay Measurement	First Silver
9. RVSM Risk Assessment Software for RVSM Airspace	Second Silver
10. Job Tracking System on DTRS WAP Application	Third Silver
11. Real-time IAQ Monitoring	First Bronze
12. Search Engine and Sharing Centre	Second Bronze
13. Semi-Automatic Security Risk Assessment	Third Bronze
14. Log DE (Daily Report & Flight Information Data Collection)	Fourth Bronze

AEROTHAI INNOVATION

นิทรรศการ
ผลงานนวัตกรรม
และแนวคิดสร้างสรรค์ บวท.
ประจำปี 2563

สภาพภูมิประเทศ สำหรับการแจ้งเตือน MSAW

MSAW Elevation Profile

ประเภทของการประกวด
รางวัลผลงานนวัตกรรมเพื่อการขับเคลื่อนองค์กร

รายละเอียดโดยย่อ

เพื่อให้ระบบ MSAW พร้อมใช้งานให้ทันกำหนดการแก้ไข Finding โดยใช้โปรแกรม Quantum GIS (QGIS) ซึ่งจัดอยู่ในกลุ่มของซอฟต์แวร์รหัสเปิด (Free and Open Software) มาใช้ในการจัดทำข้อมูลสภาพภูมิประเทศในรูปแบบ Global Digital Elevation Model 2 (GDEM2) ของ NASA พร้อมกับการใช้ Bash Shell Script สร้างแผนที่ เพื่อเพิ่มความสะดวกและรวดเร็วในการปรับแต่งสภาพภูมิประเทศ โดยอ้างอิงข้อมูล Approach Chart ร่วมกับ ATC เพื่อให้การแจ้งเตือนมีความเหมาะสมและถูกต้องแม่นยำมากขึ้น

ประโยชน์ของผลงาน

การจัดทำสภาพภูมิประเทศสำหรับการแจ้งเตือน MSAW โดยไม่มีค่าใช้จ่าย และเพิ่มประสิทธิภาพในการแจ้งเตือน MSAW ให้เหมาะสมกับการทำงานของ ATC มากที่สุด โดยการใช้ Shell Script เพื่อเพิ่มความรวดเร็วและลด Human Error ในการวาด MSAW MAP ควบคู่กับการแก้ไขปรับปรุงข้อมูลสภาพภูมิประเทศ รวมถึงค่า Parameters ต่างๆ ระหว่างฝ่ายปฏิบัติการและฝ่ายวิศวกรรมเพื่อให้การควบคุมการจราจรทางอากาศมีประสิทธิภาพและความปลอดภัยสูงสุด

วัตถุประสงค์ในการดำเนินการ

- จัดทำข้อมูลสภาพภูมิประเทศในรูปแบบ Global Digital Elevation Model 2 (GDEM2) สำหรับการแจ้งเตือน MSAW
- ลดระยะเวลาในการจัดทำแผนที่สภาพภูมิประเทศ สำหรับการปรับแต่งสภาพภูมิประเทศให้การแจ้งเตือนมีความเหมาะสมและถูกต้องแม่นยำมากขึ้น
- ประหยัดค่าใช้จ่ายในการจัดทำข้อมูลสภาพภูมิประเทศ

ภาพผลงาน

ทีมผู้วิจัย สังกัด วต.บว.

1. นายอดิศักดิ์ กิจยโกศ
2. นางสาวพิมพ์ณดา วุฒิเสรีลักษณ์
3. นางสาวพิรญาณ์ วิริยะอัครเดชา

goodinnovation
BETTER LIFE, BEST FUTURE
AEROTHAI INNOVATION

AEROTHAI INNOVATION

นิทรรศการ
ผลงานนวัตกรรม
และแนวคิดสร้างสรรค์ บวท.
ประจำปี 2563

ระบบประสานงานบริหารจราจรทางอากาศระหว่างทหารและพลเรือน

THAI CIVIL MILITARY AIR TRAFFIC MANAGEMENT COORDINATION SYSTEM

ประเภทของการประกวด

รางวัลผลงานนวัตกรรมเพื่อการขับเคลื่อนองค์กร

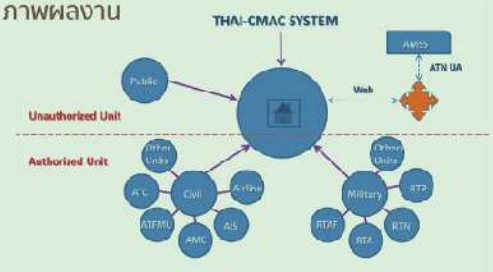
รายละเอียดโดยย่อ

ตามประกาศ "คำสั่งคณะกรรมการการบินพลเรือน" ที่ 6/2561 ได้มีคำสั่งให้จัดตั้งศูนย์บริหารห้วงอากาศ (Airspace Management Cell) โดยมีวัตถุประสงค์หลักเพื่อกำหนดนโยบายและกลไกขับเคลื่อนในระดับสูง ในการใช้ประโยชน์ห้วงอากาศร่วมกันระหว่างฝ่ายความมั่นคงและพลเรือน โดยนำแนวคิดการบริหารจัดการ แบบยืดหยุ่น (Flexible Use of Airspace – FUA) มาใช้ในการพัฒนาระบบห้วงอากาศของประเทศเพื่อรองรับการเจริญเติบโตของปริมาณการขนส่งทางอากาศที่มีแนวโน้มเพิ่มขึ้นอย่างต่อเนื่อง โดยให้มีส่งเสริมการวิจัย การพัฒนาเทคโนโลยี และกระบวนการบริหารจัดการห้วงอากาศของประเทศ และพิจารณาการบริหารจัดการห้วงอากาศแบบพลวัต (Dynamic Airspace Management) จึงเป็นที่มาของการพัฒนาโปรแกรมระบบ THAI CMAC ที่สามารถแก้ปัญหาต่าง ๆ ในการบริหารจัดการห้วงอากาศแบบพลวัตได้อย่างเหมาะสมกับการใช้ทรัพยากรห้วงอากาศชาติ ให้เกิดประโยชน์สูงสุดต่อไป

วัตถุประสงค์ในการดำเนินการ

- เพื่อพัฒนาระบบประสานงานบริหารจราจรทางอากาศระหว่างทหาร และพลเรือน (THAI CMAC System) สำหรับการบริหารจัดการห้วงอากาศ
- เพื่อสนับสนุนแผนกลยุทธ์และแผนพัฒนาระบบการบินขององค์การการบินพลเรือนระหว่างประเทศ (Aviation System Block Upgrades – ASBUs)
- เพื่อสนับสนุนการใช้ห้วงอากาศร่วมกันระหว่างทหารและพลเรือนอย่างคล่องตัวและมีประสิทธิภาพ โดยใช้ระบบ THAI CMAC สำหรับการปฏิบัติงานของเจ้าหน้าที่ที่ปฏิบัติงานภายใน Airspace Management Cell (AMC) และสำหรับผู้ที่เป็นตัวแทนศูนย์ที่ไปประสานงานระหว่างการฝึกนอกหน่วยงาน

ภาพผลงาน



ประโยชน์ของผลงาน

- สามารถนำมาใช้การบริหารจัดการห้วงอากาศ ด้วยระบบ Thai CMAC และประหยัดค่าใช้จ่ายและงบประมาณ ในการจัดซื้อจัดหาและติดตั้งระบบบริหารจัดการห้วงอากาศจากต่างประเทศ
- เพิ่มประสิทธิภาพและอำนวยความสะดวกในการปฏิบัติงาน
- ใช้เป็นแหล่งศูนย์การเผยแพร่ จัดเก็บ จัดการ และนำไปใช้กับหน่วยงานต่าง ๆ ที่เกี่ยวข้องได้อย่างมีประสิทธิผลมากยิ่งขึ้น
- มีหน่วยงานหลักในการบริหารห้วงอากาศแบบคล่องตัว (Flexible Use of Airspace) และมีการใช้ห้วงอากาศร่วมกันระหว่างทหารและพลเรือนอย่างมีประสิทธิภาพ
- ช่วยให้เกิดความสัมพันธ์ที่ดีและการประสานงานกันอย่างใกล้ชิดระหว่างทหารและพลเรือน
- สนองนโยบายการจัดตั้งศูนย์บริหารจัดการห้วงอากาศแห่งประเทศไทย (Airspace Management Cell – Thailand : AMC Thailand)

ทีมผู้วิจัย

1. นายบัญชา ถึงบัวหลวง	สังกัด ศห.บจ.
2. นายกวีศักดิ์ กาญจนสุวรรณ	สังกัด ศห.บจ.
3. นายอลงกรณ์ สุริเย	สังกัด ศห.บจ.
4. นายคม พรมสุทธิกุล	สังกัด นบ.
5. นายกวิช เนาวรัตน์กุลชัย	สังกัด วว.สว.
6. นายกณกวัต เขมาวาศน์	สังกัด วว.สว.

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ประจำปี 2563

อุปกรณ์วัดความหน่วงของสัญญาณเสียงแบบสามารถเลือกค่าเทรสโฮลด์ได้

The Selectable Threshold Voice Delay Measurement

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

ผลงานชิ้นนี้เป็นการสร้างอุปกรณ์ที่ช่วยวัดค่าความหน่วงของสัญญาณเสียงระหว่าง 2 สัญญาณ โดยไม่ส่งผลกระทบต่อการให้บริการระบบสื่อสาร โดยวัดจาก Roundtrip Delay อุปกรณ์ช่วยลดระยะเวลาและความซับซ้อนของการวัดค่าความหน่วง โดยใช้ Microcontroller ร่วมกับ Sensor และวงจรไฟฟ้าที่ออกแบบเอง ซึ่งสามารถลดระยะเวลาการทำงานจาก 15 นาที เหลือไม่ถึง 1 นาที

วัตถุประสงค์ในการดำเนินการ

- สร้างอุปกรณ์ที่สามารถวัดและแสดงค่าหน่วงเวลาได้ทันที
- ลดความซับซ้อนในการทำงาน

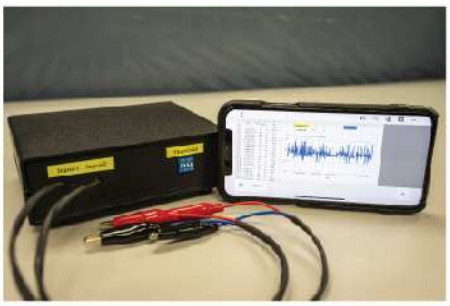
ประโยชน์ของผลงาน

- ช่วยลดระยะเวลาการหาค่าความหน่วงของสัญญาณเสียง
- ช่วยลดขั้นตอนการหาค่าความหน่วงของสัญญาณเสียง
- สามารถประยุกต์ใช้ได้กับอุปกรณ์ทุกประเภท
- ต้นทุนต่ำ

ทีมผู้วิจัย สังกัด วส.บว.

1. นายพงษ์ภูมิ กันลิกรี
2. นายภาณุวัฒน์ บูชารัตนกุล
3. นายธนากฤต นันทาทอง
4. นายไพรัชฎ ช่วยเมฆ
5. นายอลงกรณ์ ปรัชญนาวิน
6. นายขวัญชัย นวไพบูลย์
7. นายอาสาฬห์ มณีจันทร์

ภาพผลงาน



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ประจำปี 2563

อุปกรณ์บันทึกหน้าจอแสดงผล ระบบติดตามอากาศยาน สำหรับการบริการจราจรทางอากาศ

Video Recording Equipment for Air Traffic Service Surveillance System

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

เป็นอุปกรณ์สำหรับบันทึกหน้าจอแสดงผลการทำงานของเจ้าหน้าที่ควบคุมจราจรทางอากาศ ที่แสดงผลบนจอ CWP (Control Working Position) ความละเอียดหน้าจอแสดงผล 2048 x 2048 พิกเซล ซึ่งอุปกรณ์สามารถบันทึก ควบคุม สั่งงาน การป้อนข้อมูลต่าง ๆ ของเจ้าหน้าที่ควบคุมจราจรทางอากาศ และสามารถนำมาเปิดดูข้อมูลวีดีโอย้อนหลัง (Video Playback) ได้ในระยะเวลา 6 เดือน เป็นอย่างน้อย เพื่อใช้ในการสอบสวนสาเหตุต่าง ๆ และยังสามารถทำการขยาย (Zoom) เฉพาะตำแหน่งที่สนใจในวีดีโอย้อนหลังได้

วัตถุประสงค์ในการดำเนินการ

- บันทึกหน้าจอแสดงผลระบบติดตามอากาศยาน เพื่อนำมาตรวจสอบสาเหตุของข้อขัดข้องที่เกิดขึ้น
- บันทึกหน้าจอแสดงผลระบบติดตามอากาศยาน เพื่อนำมาตรวจสอบการใช้งานจอแสดงผล (Human Machine Interface) ของเจ้าหน้าที่ควบคุมจราจรทางอากาศ ว่าสามารถใช้งาน Function ต่าง ๆ ได้ถูกต้องหรือไม่
- บันทึกหน้าจอแสดงผลระบบติดตามอากาศยาน เพื่อนำมาตรวจสอบการทำงานของระบบเรดาร์ได้สะดวก รวดเร็ว และสามารถนำวิดีโอดังกล่าวมาจัดทำเป็นสื่อการเรียนรู้เพื่อทำความเข้าใจหลักการของการควบคุมจราจรทางอากาศมากขึ้น

ประโยชน์ของผลงาน

- สามารถตรวจสอบสาเหตุข้อขัดข้อง ตำแหน่งจอแสดงผลของเจ้าหน้าที่ควบคุมจราจรทางอากาศ และ เจ้าหน้าที่ Flight Data Operation (FDO) ที่เกิดจากระบบ หรือเกิดจากการใช้งาน และนำไปแก้ไขข้อขัดข้องดังกล่าว
- เพิ่มประสิทธิภาพ ในการควบคุมจราจรทางอากาศ และการแก้ปัญหาระบบ รวมทั้งเป็นการป้องกันการเกิดอุบัติการ หรืออุบัติเหตุ ที่อาจจะเกิดขึ้น

ทีมผู้วิจัย สังกัด วต.บว.

1. นายสุทพ อินทร์ศร
2. นายสุพล กันสทร์
3. นายธนกฤต พรหมมี

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รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รางวัลระดับ Gold 1

อุปกรณ์วัดความหน่วงของสัญญาณเสียงแบบสามารถเลือกค่าเทรสโฮลด์ได้

The Selectable Threshold Voice Delay Measurement

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

ผลงานชิ้นนี้เป็นการสร้างอุปกรณ์ที่ช่วยวัดค่าความหน่วงของสัญญาณเสียงระหว่าง 2 สัญญาณ โดยไม่ส่งผลกระทบต่อการให้บริการระบบสื่อสาร โดยวัดจาก Roundtrip Delay อุปกรณ์ช่วยลดระยะเวลาและความซับซ้อนของการวัดค่าความหน่วง โดยใช้ Microcontroller ร่วมกับ Sensor และวงจรไฟฟ้าที่ออกแบบเอง ซึ่งสามารถลดระยะเวลาการทำงานจาก 15 นาที เหลือไม่ถึง 1 นาที

ทีมผู้วิจัย สังกัด วล.บว.

1. นายพงษ์ภูมิ กันลิกรี
2. นายภาณุวัฒน์ บูชารัตนกุล
3. นายธนากฤต นันทาทอง
4. นายไพรัชฎ ช่วยเมฆ
5. นายอลงกรณ์ ปรัชญนาวิน
6. นายขวัญชัย นวไพบูลย์
7. นายอาสาฬห์ มณีจันทร์

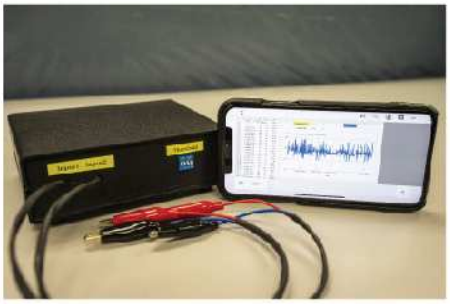
วัตถุประสงค์ในการดำเนินการ

- สร้างอุปกรณ์ที่สามารถวัดและแสดงค่าหน่วงเวลาได้ทันที
- ลดความซับซ้อนในการทำงาน

ประโยชน์ของผลงาน

- ช่วยลดระยะเวลาการหาค่าความหน่วงของสัญญาณเสียง
- ช่วยลดขั้นตอนการหาค่าความหน่วงของสัญญาณเสียง
- สามารถประยุกต์ใช้ได้กับอุปกรณ์ทุกประเภท
- ต้นทุนต่ำ

ภาพผลงาน



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โปรแกรมคำนวณความเสี่ยง และประมวลผลข้อมูลความปลอดภัย ใน RVSM Airspace

RVSM Risk Assessment Software

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

โปรแกรมนี้ออกแบบมาเพื่อสนับสนุนงานด้านความปลอดภัยใน RVSM Airspace ในภูมิภาคเอเชีย โดยเป็นการออกแบบโปรแกรมวิเคราะห์และประมวลผลข้อมูลแทนมนุษย์ ทำให้ประหยัดเวลาและเพิ่มความถูกต้อง นอกจากนี้เนื่องจากโปรแกรมนี้ช่วยให้ประหยัดเวลาการทำงาน ทำให้หน่วยงาน Monitoring Agency for Asia Region (MAAR) สามารถจัดทำรายงานความปลอดภัย (Safety Report) ที่มีความละเอียด และความถี่มากขึ้นได้ เพื่อเป็นการกระตุ้นให้ประเทศต่าง ๆ ในภูมิภาครับรู้สถานการณ์ความเสี่ยงและแก้ไขปัญหาได้ทันท่วงที

วัตถุประสงค์ในการดำเนินการ

- เพื่อพัฒนาซอฟแวร์คำนวณความเสี่ยงและประมวลผลข้อมูลความปลอดภัยใน RVSM Airspace โดยมุ่งหวังให้ลดเวลาในการทำงาน (time) และลดความผิดพลาด (เพิ่ม quality) ทำให้การทำงานมีประสิทธิภาพ (efficiency) มากขึ้น
- เพื่อลดขั้นตอน ลดความผิดพลาดและเพิ่มประสิทธิภาพในการทำงาน

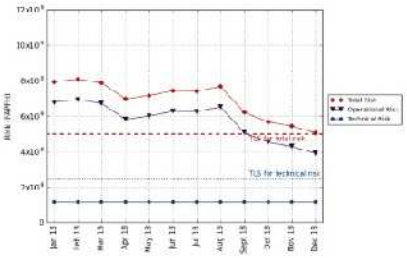
ประโยชน์ของผลงาน

- ลดขั้นตอนและเวลาในการปฏิบัติงาน
- เพิ่มความละเอียดในการคำนวณความเสี่ยงและวิเคราะห์ความเสี่ยง ซึ่งมีผลต่อการกระตุ้นให้ stakeholders ตื่นตัวด้านความปลอดภัย
- ลดความผิดพลาดที่เกิดจาก Human Error

ทีมผู้วิจัย สังกัด คป.มป.

1. นางสาวนัทธมน ถาวรพิทักษ์
2. นางสาวลายฝน อบรมสุข
3. นายดลสกุษฎ์ สมแสง
4. นางสาวรินธิดา จรเทศ
5. นายพลกฤษณ์ เศวตสุดธร
6. นางสาวจันทิมา ศรีเดียเพ็ชร
7. นายรักสิต สุนทรมาลัย

ภาพผลงาน



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นิทรรศการ
ผลงานนวัตกรรม
และแนวคิดสร้างสรรค์ บวท.
ประจำปี 2563

ระบบติดตามงานผ่าน WAP Application บนระบบวิทยุสื่อสาร Digital Trunked Radio System (DTRS)

Job Tracking System on DTRS WAP Application : JTrack

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

ระบบ JTrack เป็นระบบส่งข้อมูลเพื่อรายงานสถานะงาน (Job Activity) ผ่านวิทยุสื่อสารระบบ Digital Trunked radio System (DTRS) โดยจะเริ่มนำไปใช้กับฝ่ายโภชนาการ บริษัท การบินไทย จำกัด (มหาชน) ในการรายงานการส่งอาหารไปยังเครื่องบิน ข้อมูลนี้จะเชื่อมต่อกับระบบ Ground Operation Control Center (GOCC) ของ บริษัท การบินไทยฯ โดยอัตโนมัติ ซึ่งจะเป็นการลดข้อผิดพลาดและเพิ่มประสิทธิภาพในการให้บริการภาคพื้นดิน (Ground Service) และจะทำให้การบริหารจัดการเที่ยวบินเป็นไปตามเวลาที่กำหนด

วัตถุประสงค์ในการดำเนินการ

- ลดขั้นตอนการทำงาน และเพิ่มประสิทธิภาพในการทำงานของหน่วยงาน GOCC บริษัท การบินไทยฯ
- เพิ่มมูลค่าให้ระบบ DTRS โดยการพัฒนาบริการใหม่ ๆ บนระบบ DTRS
- เป็นต้นแบบและสามารถนำไปประยุกต์เพื่อใช้งานกับหน่วยงานอื่น ๆ ที่ใช้งานวิทยุสื่อสารระบบ DTRS ได้

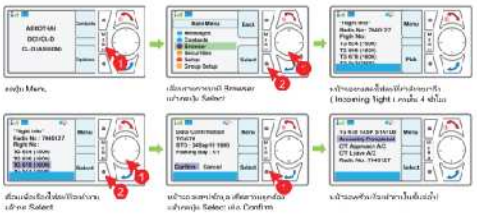
ประโยชน์ของผลงาน

- ทำให้เกิดความร่วมมือระหว่างหน่วยงานในการสร้างนวัตกรรมที่สามารถนำไปประยุกต์ใช้งานให้เกิดประโยชน์กับภารกิจของ บวท. และเป็นประโยชน์กับอุตสาหกรรมการบินของประเทศด้วย
- ลดความผิดพลาดในการสื่อสาร เพิ่มประสิทธิภาพการให้บริการภาคพื้นดินของ บริษัท การบินไทยฯและยังสามารถเก็บข้อมูลการให้บริการภาคพื้นดินเพื่อนำมาวิเคราะห์และพัฒนาการทำงาน รวมถึงสามารถประหยัดงบประมาณให้กับ บริษัท การบินไทยฯ ได้อีกด้วย
- บริษัท การบินไทยฯ ซึ่งเป็นผู้ให้บริการหลักในการให้บริการภาคพื้นดินที่สนามบินสุวรรณภูมิ สามารถให้บริการได้อย่างมีประสิทธิภาพ ทำให้สามารถนำเครื่องบินขึ้นบินได้ตามตารางการบิน (On-time Departures) ส่งผลให้สายการบินได้รับความน่าเชื่อถือจากผู้ใช้บริการ รวมถึงช่วยลดความคับคั่งของการจราจรภาคพื้นดิน ณ ท่าอากาศยานสุวรรณภูมิ ซึ่งจะทำให้เกิดประโยชน์ กับอุตสาหกรรมการบินโดยรวมด้วย
- สร้างความเชื่อมั่น เชื่อถือ และไว้ใจ (Brand Loyalty) ในการใช้งานวิทยุสื่อสารระบบ DTRS ของ บริษัทฯ

ทีมผู้วิจัย สังกัด บส.วบ.

1. นายอภิชัย อินทุโสมา
2. นายอรรถพร สิงห์คีรี
3. นายณัฐวุฒิ จำปาลา
4. นายพรเทพ ทยาเลิศบวร
5. นายจักรกฤษณ์ ดุวานนท์
6. นางสาวภัทรอร นามพันธุ์นาย
7. นางสาวเจษฎ์สุดา สุทธิสำแดง

ภาพผลงาน



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รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รางวัลระดับ Bronze 1

ระบบตรวจวัดคุณภาพอากาศแบบ Real-time

Real-time IAQ Monitoring

ประเภทของการประกวด : รางวัลผลงานนวัตกรรมที่สร้างคุณค่าเพิ่มให้องค์กร

รายละเอียดโดยย่อ

เป็นอุปกรณ์ตรวจสอบและจัดเก็บข้อมูลคุณภาพอากาศต่าง ๆ เช่น Temperature, Humidity, PM 2.5, Co2 ในพื้นที่ตลอด 24 ชั่วโมง ผ่านระบบ Wireless Networks SCADA ทำให้การตรวจสอบคุณภาพอากาศและปรับปรุงคุณภาพอากาศในพื้นที่ทำได้อย่างมีประสิทธิภาพ ติดตั้งง่ายลดต้นทุน แก้ปัญหาคุณภาพอากาศได้ตรงจุด

วัตถุประสงค์ในการดำเนินการ

- เพื่อตรวจสอบและจัดเก็บข้อมูลคุณภาพอากาศ ได้แก่ Temperature, Humidity, PM2.5, CO2 นำมาเป็นข้อมูลในการบริหารจัดการปรับปรุงคุณภาพให้มีประสิทธิภาพ
- เพื่อบริหารต้นทุนในการปรับปรุงคุณภาพอากาศ
- เพื่อนำองค์ความรู้ด้าน Sensor และการปรับปรุงคุณภาพอากาศมาขอรับการรับรอง RESET Standard certification เป็นการสร้าง Value ให้แก่องค์กร

ประโยชน์ของผลงาน

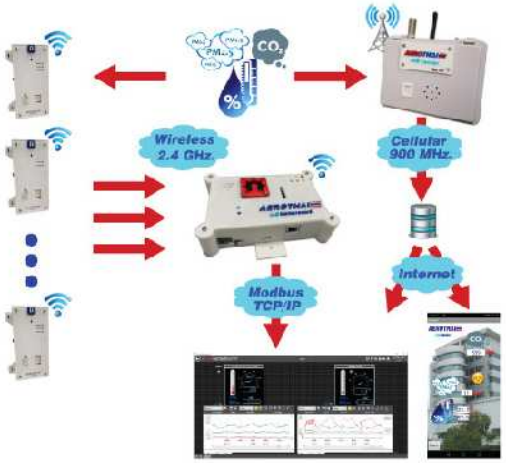
ประโยชน์ของผลงานนี้ต่อการกิจของบริษัทฯ หรือผลเชิงพาณิชย์/ผลต่อสังคม

- ตรวจสอบคุณภาพอากาศได้รวดเร็วและมีประสิทธิภาพ
- ติดตั้งง่ายใช้งานง่ายสะดวกในการเคลื่อนย้าย
- ได้ข้อมูลแบบ Real-time ทำให้สามารถนำข้อมูลมาปรับปรุงคุณภาพอากาศได้อย่างมีประสิทธิภาพ
- ลดต้นทุนการจัดซื้อจัดจ้าง

ทีมผู้วิจัย สังกัด อส.ศป.

1. นายสุรพันธุ์ บุญญานุภาพพงศ์
2. นายชาญณรงค์ ศักดิ์สิริสกุล
3. นายนฤเดช สุจินพรัม

ภาพผลงาน



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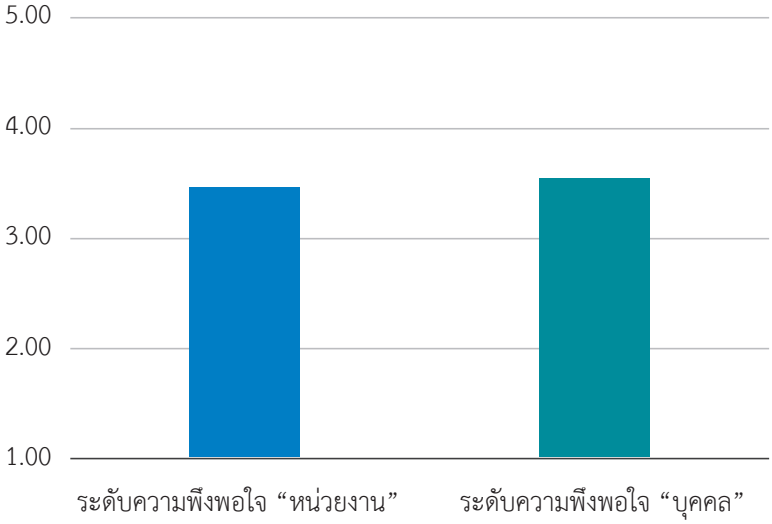
Users' Satisfaction

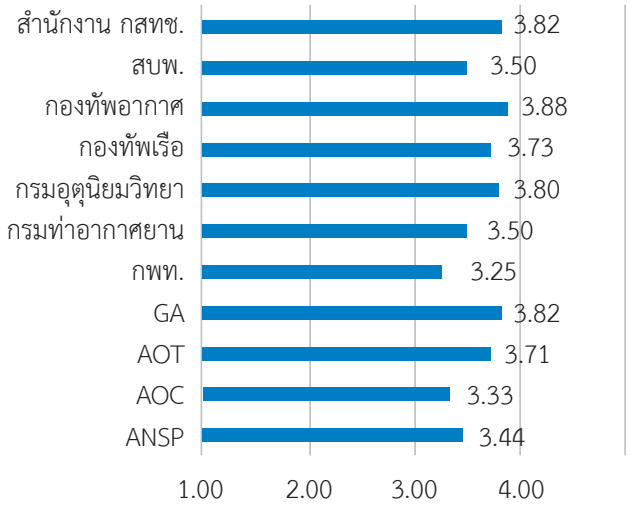
The Company has annually conducted users' satisfaction survey to assess users'/stakeholders' satisfaction, dissatisfaction, requirements and expectation by receiving feedback from major customers and stakeholders with the following objectives:

- To provide users and stakeholders with channels to communicate their satisfaction, dissatisfaction, expectations and requirements to the Company from their point of view.
- To use suggestions and recommendations for the improvement of services, and services provision procedures. This information will be used to reduce users' dissatisfaction and draft stakeholders' relations management plan.
- To use the study results for the improvement of communications with related units so that they can improve their services.
- To prioritize the improvement process for operations and services provision by using suggestions of dissatisfaction and expectations from major stakeholders' management.

In the fiscal year 2020, the Company did not carry out the users' satisfaction survey due to COVID-19 pandemic. However, the Company continues to improve/develop its services by basing on the 2019 survey result.

Stakeholders' Satisfaction Survey





Summary of stakeholders' satisfaction survey covering 6 aspects:

1) Benefits from receiving important IT information,
2) Listening to suggestions and/or requirements of stakeholders and suitably taking actions according to said suggestions/ requirements for joint benefits,
3) Stakeholders are invited to participate in all related activities organized by AEROTHAI,
4) Stakeholders are allowed to take part in any events/activities arranged by AEROTHAI at suitable levels,
5) Benefits/achievements which stakeholders gain from participating in AEROTHAI's activities,
6) Cooperation from AEROTHAI to participate in activities arranged by stakeholders. Average points were 3.91 in 2019, 3.71 in 2018 and 3.70 in 2017. It can be seen that the survey results in the past 3 years have continued to increase.

Facility Visit by Senate Transport Committee

On 1 July 2020, Mr. Somnuk Rongthong, President and the Management welcomed General Yodyut Boonyathikarn, Chairman of the Commission, Senate Transport Committee and members of the Committee to visit the Company at its head office. They were briefed on AEROTHAI's functions and views on impacts of Corona Virus Disease (COVID-19) pandemic on volume of air traffic and financial status as well as strategy to reduce impacts were exchanged.

Deputy Minister of Transport Visited and Inspected the Preparation of Airport Opening at Betong, Songkhla

Mr. Thaworn Senneam, Deputy Minister of Transport, and party visited and inspected the preparation of airport opening at Betong, Songkhla between 10-11 September 2020. The airport is a new airport which is the 29th airport of the Department of Airports. The party inspected the preparation for the provision of services according to the Government's policy to stimulate the economy in the south both investments and tourism and increase the capability of air transportation. It is one of the international aviation strategies to support the free ASEAN. The Prime Minister and Government have seen the importance of the local development in the southern border provinces. AEROTHAI has constructed the control tower and installed communications system, air navigation system as well as personnel to work at the control tower. Air traffic controllers have been trained and received licences from the Civil Aviation Authority of Thailand. AEROTHAI is prepared to provide air navigation services for the safety of all flights flying to/from Betong Airport.

Deputy Minister of Transport Visited and Listened to Report of the Progress on Air Navigation Services Provision at U-tapao Airport

On 24 August 2020, Mr. Thaworn Senneam, Deputy Minister of Transport, and party visited and listened to report of the progress on AEROTHAI's air navigation services provision at U-tapao Airport. AEROTHAI has been assigned by the Government to provide air navigation services under the Development of U-Tapao Airport and Eastern Aviation City. Mr. Somnuk Rongthong, President, Mr. Tinnagorn Choowong, Executive Vice President (Operations) and Mr. Suttipong Kongpool, Executive Vice President (Safety and Standards), acknowledged the Government's policy and reported the responsibility scope of AEROTHAI, project implementation plan, progress as well as any problems in order to make long-term preparation for the growth of air transportation of the Country. The venue for the event was arranged at Naval Aviation Division, Rayong.

Signing Letter of Agreement Between Aeronautical Radio of Thailand Limited (AEROTHAI) and the Meteorological Department (TMD)

On Thursday 18 June 2020, Mr. Somnuk Rongthong, President and Group Captain Somsak Khaosuwan, Director-General, signed the Letter of Agreement (LOA) for aeronautical meteorological cooperation for the safety and speed of flight management witnessed by Mr. Nuttawat Supanundha, Executive Vice President (Engineering) and Miss Kornrawee Sitthichivapak, Deputy Director-General for Operations. The event took place at the Conference Room, Meteorological Department, Sukhumvit Road, Bang Na District, Bangkok. The signing of this 2020 Letter of Agreement is the revision of the 2016 Letter of Agreement in line with the International Civil Aviation Organization's (ICAO) standards and recommended practices on Agreement between Air Traffic Services Authorities and Meteorological Authorities. Major objectives are as follows:

- In order that AEROTHAI's aeronautical meteorological operations and air traffic control operations are provided according to standards and safe for all flights by providing accurate, speedy, precise, in time and useful aeronautical meteorological information to make flight plan and manage flights for air traffic management and flights.
- AEROTHAI has continued to cooperate with TMD to enhance safety and flexibility in air traffic management by TMD providing weather forecast and alert of bad weather or any abrupt change of weather which may cause hazards to en route flight operations, especially in the areas where aircraft are ascending or descending and approach areas. AEROTHAI's personnel and TMD's officers have continued to cooperate and integrate their operations at all airports nationwide.
- To raise the standards of the Country's aeronautical meteorological industry to be in line with the International Civil Aviation Organization's guidelines for International Aviation Development Plan.
- To exchange information, connect related systems and equipment, provide personnel to share knowledge which has increased the efficiency of co-working. This includes the cooperation of aeronautical meteorological development to support international aeronautical meteorological technology which is beneficial to the national aviation system. This is a major cooperation of the Country to drive the operations and enhance clear benefit with maximum objective of aviation development according to ICAO's standards based on the safety of passengers.

Sustainable Social Development

Taking Care of Society and Community

In the fiscal year 2020, the Company followed the Master Plan relating to the Corporate Social Responsibility to enhance the safety recognition and change of social behaviour. AEROTHAI realized the importance of human resource development, caring for society and community in many dimensions, promoting development for sustainability to encourage society and community to be aware that some activities and cultures may have impacts on the aviation safety of the Country at the community level and the youth.

- **Community Innovation**

  The Company promoted innovation culture so that the Company's personnel could carry out research and develop innovation for the strength of communities. This would benefit the communities around the Company and airports by utilizing the Company's core competencies which were standards and skills in provision of air navigation services recognized by the aviation industry and the expertise in technology and air traffic innovation of the Company's personnel. Such communities were as follows:

  - Communities around the airports, near the approach or flight path which were affected by AEROTHAI's services.
  - Communities that caused impacts on AEROTHAI's services such as communities that launched rockets, sky lanterns, drones and the communities that operated radio services around the airports, near the approach or flight path.
  - Other social communities: to create opportunities and encourage people in the communities to realize that they could work by not creating any pollution to the environment which was the way to display corporate social responsibility as a well managed organization.

High level management have participated by being members of the Promotion of Research, Development and Innovation Committee and Sub-Committee with continued budget allocation. Furthermore, experts from other organizations have been invited to be advisers to the Committee. Those experts are knowledgeable, competent, highly-skilled and being recognized of their specific expertise at a national level. The Company promoted community innovation to be developed systematically and sustainably by pushing the communities to create innovation that could be used and expanded to benefit the communities especially to increase income to targeted communities which would enhance cooperation and good alliance between targeted communities and AEROTHAI.

- **Community Innovations that received awards in 2019 and expanded to benefit the community in 2020**

Rice Seeding Machine Modified Version for Water

On 20 August 2020, AEROTHAI delivered 15 sets of Rice Seeding Machine Modified for Water to the Rice Department to promote and support the use of machine in rice sowing. These machines were community innovation by AEROTHAI that has been patented with the Department of Intellectual Property. Mr. Kajon Raoprasert, Deputy Director-General, Rice Department received the machines while Mr. Sukluer Chiawarcheep, Executive Vice President (Policy and Human Resources), delivered the machines.

The Rice Seeding Machine won the first prize in the community agriculture category of the 2015 Community Innovation Project of Phitsanulok Air Traffic Control Centre and best award of the 2016 Innovations Expansion Project (Community Relations). It is well known and many governmental agencies and farmers have used these machines to cut production costs in agriculture and increase produce by using complete innovation. Farmers have been educated from ground preparation through harvest and process for sale. The farmers in Bang Rakam, Phitsanulok were interested and used the machines to expand their organic rice fields in 2018. The 105 Hom Mali rice was sowed in Mr. Anake Tinwongyae's 6 rais rice field. Thereafter in 2019 the innovation was introduced to Sufficiency Economy Mixed Farm Fields Learning Centre, Kong Krailat, Sukhothai and Phitsanulok Food Safety Project, Phrom Phiram, Phitsanulok. The result of development of said innovation has benefited the communities and farmers according to AEROTHAI's Corporate Social and Environmental Responsibility Policy.

Solar Cell Blue Swimming Crabs Bank

On 6 March 2018, the Cabinet approved the expansion of Blue Swimming Crabs Bank in order to "return the blue swimming crabs to the Thai sea" to coastal community by using research and innovation knowledge from the National Research Council of Thailand. This Blue Swimming Crabs Bank has been supported by many organizations, e.g. Government Savings Bank, Department of Fisheries, Thailand Post, etc.

AEROTHAI's innovator at Surat Thani Air Traffic Control Centre has seen the benefit of the Blue Swimming Crabs Bank so he extended this project for the maximum benefit of the community by proposing "Solar Cell Blue Swimming Crabs Bank" with the following concepts:

- To support the Government's Policy according to the Cabinet's resolution to support the expansion of Blue Swimming Crabs Bank to "return the blue swimming crabs to the Thai sea".
- To propose new way to make contribution to community by increasing the number of Blue Swimming Crabs, create sustainable career and income to community. It also built cooperation between the community and AEROTHAI.

Solar Cell Blue Swimming Crabs Bank Project: The innovator improved the process by using solar cells to generate electricity to feed the Blue Swimming Crabs Bank with standby system in case of emergency when the sky was dark or it rained. When the solar cells could not charge the battery, the power supply would be lower than set standards, there would be voice alert and inventor would switch the power supply system to use the power supply from the Provincial Electricity system. If there was a power outage from the Provincial Electricity Authority then standby power supply system could be used. This was a guarantee that the mother crabs and baby crabs in the hatchery tank continued to be supplied with oxygen. The results of the innovation development to extend the Blue Swimming Crabs Bank Project to the community were as follows:

- The Blue Swimming Crabs Bank did not have any electricity expenditure.
- Use alternative energy to reduce global warming.
- Solar cell system and standby system built confidence and increase the survival rate for the baby crabs and mother crabs.

The innovator has cooperated with the Pumriang Bay Conservation Group to develop this innovation so that it could be widely used as the location of Lampho Community, Pumriang, Chaiya District, Surat Thani was the learning centre for students and teachers from all over the Country. The project was expanded to other communities in Surat Thani, Ranong, Chumphon, Trang and Phetchaburi. Apart from alternative energy, the prominent point of this innovation was that AEROTHAI's innovator, Acting Sub Lieutenant Somnuek Chuaykong has extended the project by establishing "Return Blue Swimming Crabs to the Thai Sea Truth Group". He received full cooperation from the community with Mr. Sutham Abmanee, member of the community being the chairman of the Group and Acting Sub Lieutenant Somnuek Chuaykong, General Administrative Assistant Manager (Provincial Centre), Surat Thani Air Traffic Control Centre being member and secretary.

Return Blue Swimming Crabs to the Thai Sea Truth Group
It has been registered with the National Farmers Federation according to Item 20(4) of the National Farmers Federation Act, B.E. 2553 since 23 December 2019.

The Return Blue Swimming Crabs to the Thai Sea Truth Group has the objectives of creating conservative consciousness, sustainability of the Blue Swimming Crabs Bank and increasing the number of Blue Swimming Crabs in the sea (as the survival rate has increased). This would increase security and income for the fishermen. The main objective of the Group was "Create members' consciousness to return black egg shell mother crabs to the sea" as agreed by members of the Group.

The success of the Solar Cell Blue Swimming Crabs Bank was that members have donated mother crabs with baby crabs to release to the sea (not keeping mother crabs for sale). During a period of 6 months (June-December 2019), it could bring in income of Baht 20-30 million to the community. The development of Solar Cell Blue Swimming Crabs Bank and establishment of Truth Group has support and develop the strength of farmers and farmers' organizations by solving the problems of agricultural produce and sale, promoting and developing farmers' occupations including cooperation, promotion and providing support to the National Farmers Federation.

- **AEROTHAI Safe Airspace from Dangerous Factors**

  The Company has been pushing for the resolutions to solve the problems of sky lanterns launching and rockets firing by going to meet people in the communities, educate them with the knowledge and understanding that sky lanterns launching and rockets firing were flight hazards. The Company sought cooperation from the general public or organizers to submit letters to ask permission to launch rockets to Government Units for flight safety during the Rocket Festival (Boon Bang Fai) which is the major annual festival for the Thai people. AEROTHAI has continued to cooperate with 4 other organizations to reach the communities and society as follows:

  - The Civil Aviation Authority of Thailand (CAAT)
  - Department of Provincial Administration, Ministry of Interior
  - Geo-Informatics and Space Technology Development Agency (GISTDA)
  - Aeronautical Radio of Thailand Limited

Flight Hazards Factors

During normal situation, the hazards of sky lanterns launching or other community's activities were flight hazards factors. It was necessary that related organizations must continue to organize campaigns to the communities to make them realize the hazards of sky lanterns launching. However, in 2020 due to Corona Virus Disease (COVID-19) pandemic, AEROTHAI and related organizations did not carry out any campaign to the communities.

In 2020, AEROTHAI reviewed its Corporate Plan, 2021-2025 and set projects to be implemented after the world has recovered from Corona Virus Disease (COVID-19) pandemic. Risk management plan was set for flight hazards factors by manage problems and control the risks from flight hazards factors (rockets, sky lanterns, RPAS) as well as risk management from flight hazards factors and watch over new flight hazards factors.

- **Volunteer Activities**

Ministry of Transport Volunteer Activity for Public Benefits

On 16 August 2020, Mr. Tinnagorn Choowong, Executive Vice President (Operations) participated in the volunteer activity "Good Deed for the Nation, Region and Monarchy" under the Ministry of Transport's Volunteer Activity for Public Benefits presided by Mr. Saksayam Chidchob, Minister of Transport. The activity included Pha Pa Samakkee and Ministry of Transport's Volunteer Activity for Public Benefits in recognition of His Majesty the King's concerns of the well-being of his subjects. His Majesty has uncompromising resolution to make the Country secure, the people happy and carry on, maintain and extend the Royal Projects with the aim of all the subjects being united and participating in public activities that benefit the communities without anything in return. The activity was organized at Wat Nang Nong Worawihan, Bangkok.

- **Nan Fah Thai Foundation's Activities**

Nan Fah Thai Foundation helped the Communities to fight COVID-19

On 22 May 2020, AEROTHAI organized Nan Fah Thai Foundation's activity to help the community to fight COVID-19 by making contribution to the community affected by the Corona Virus Disease pandemic. The Company's Management and employees have donated some money together with the fund from Nan Fah Thai Foundation amounting to Baht 218,354.- and purchased consumer goods to make survival bags and distributed them to 460 families in the community in front of Thammasat Association near AEROTHAI's head office. These people were affected by the Corona Virus Disease (COVID-19) pandemic. Mr. Somnuk Rongthong, President with the Management, Nan Fah Thai Foundation's members as well as volunteers from AEROTHAI's employees and representatives from nearby organizations gave out the survival bags at the 80th Anniversary Commemoration Park.

Happiness Sharing Cabinet

AEROTHAI and Nan Fah Thai Foundation have set up happiness sharing cabinet to help and ease the troubles of people around the Company's office, who have been affected by the Corona Virus Disease (COVID-19) pandemic. Consumer goods had been put in the happiness sharing cabinet at the Immigration Bureau, Suan Plu since June 2020 till September 2020 with donation from the Management and employees to procure the consumer goods.

Human Resource Development

- **Human Resource Management**

  AEROTHAI realized that "Humans" were considered essential resources so it had the human resources management policy in line with the National Strategy for Human Resources Development Plan to accommodate Thailand 4.0, the Good Corporate Government Policy, principles and guidelines for the state enterprises' appraisal, ISO 26000 international standards, state human resources management policy as well as visions and corporate plan. AEROTHAI has set human resources policy by dividing into:

  - Policy on structure management and manpower with systematic procedures and guidelines in line with the Company's functions and direction.
  - Policy on recruitment and selection of personnel by recruiting, selecting, and appointing personnel from outside and inside the Company with systematic procedures and guidelines, transparency and fairness in line with manpower plan, career path and succession plan.
  - Policy on remuneration and benefits management by stressing remuneration and benefits management with systematic procedures and guidelines in line with their qualifications and responsibilities, industry's environment, laws and the Company's performance.
  - Policy on performance management by stressing performance management with systematic, transparent and fair procedures, principles and guidelines in line with their performance.
  - Policy on learning and development by stressing human resources development with systematic procedures and guidelines in line with individual career development as well as information technology management and knowledge management to create innovations which would support AEROTHAI to sustainably grow.
  - Policy on environment management by stressing workplace environment management with systematic procedures and guidelines in line with laws and increase personnel's quality of life. The Company also put emphasis on promotion of ethics, morals, organization's culture and labour relations with procedures according to state policy guidelines and the Company's vision and mission.
  - Policy on human resources information technology management by stressing human resources management with complete and advanced information technology tools and systems in lie with all aspects of human resources management and development environments and goals.

- **Employee Engagement**

  AEROTHAI conducted employee engagement survey with the results continued to rise for 2017-2020. The result of the employee engagement in 2020 was 77.9%.

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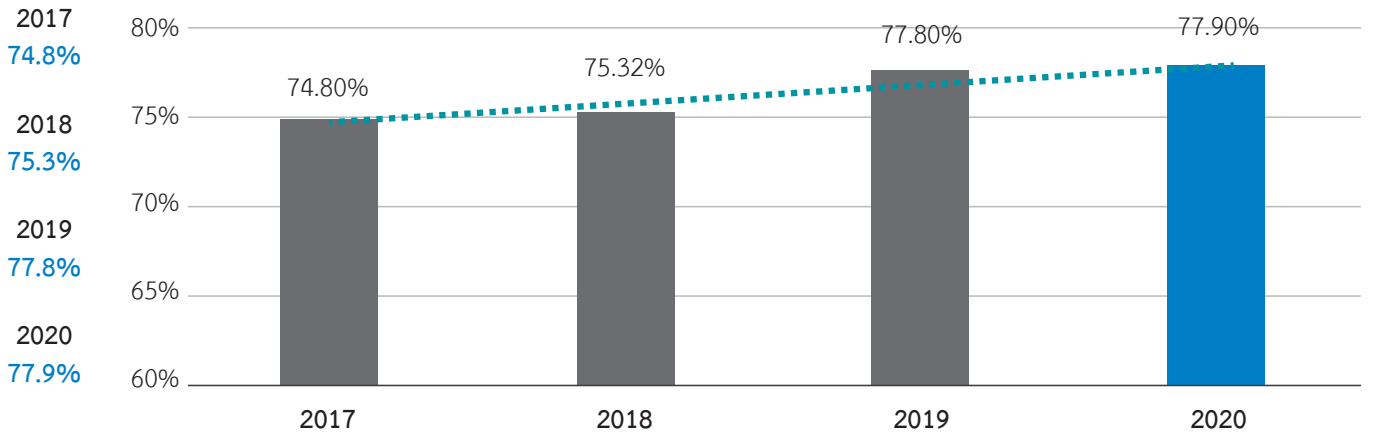


Sustainable Economic and Environmental Development

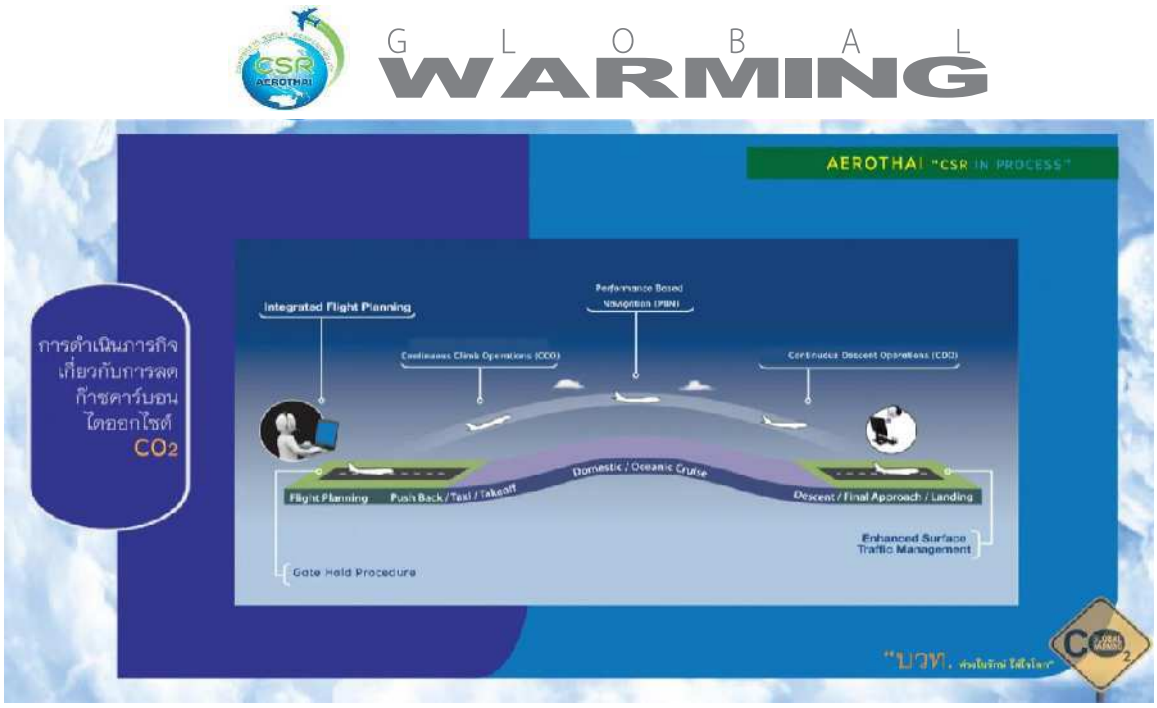
- **Greenhouse Effect Management**

  In the fiscal year 2020, AEROTHAI has continued to drive its environmental implementation to increase its efficiency in accordance with the policy on management of environment, energy and sustainable changes of the organization. The Company has created sustainable value to the business by setting environmental indicator for Carbon Emission from the deficiency of Air Traffic Management System (ATM). The implementation was corresponding to the strategic objective "To develop adequate capacity for future demand and upgrade the efficiency of aviation system." This was the Corporate Social Responsibility (CSR) that responded to the strategic objective and Corporate Plan regarding core business. It was CSR-in-process (Responsive) that continued to provide air navigation services to reduce carbon emission which would reduce negative impacts and fulfilled stakeholders' requirements. The commission of Thailand Modernization CNS/ATM System (TMCS) in 2020 increased the capacity of air navigation service system and reduce greenhouse effect. The Company also implemented Gate Hold Procedures and established Unidirectional Parallel Routes and ad hoc routes.

- **Airspace Management**

  AEROTHAI utilized its 2 core competencies, i.e. standards and skills in provision of air navigation services recognized by aviation industry and expertise in air traffic control services technology and innovations, to develop its core business of air navigation services to reduce air and noise pollution as well as global warming. This was to display its corporate social and environmental responsibilities in CSR-in-process by establishing Conditional Route (CDR), Ground Delay Program (CTOT), Continuous Descent Operations (CDO) and other ways of airspace management to increase flight efficiency and be environment friendly.

Different Types of Flight Procedures to Reduce Carbon (CO_2) Emission



Overall Operations to Reduce Carbon Emission

Significant Types of Flight Procedures that Reduce Carbon Emission

BOBCAT (Bay of Bengal Cooperative Air Traffic Flow Management Advisory System)

- Reduce fuel consumption for flights over 10 million kilograms.
- Reduce costs for airlines over US$ 110 million per year (Baht 4 billion).
- AEROTHAI has continued to develop BOBCAT to maintain efficiency and up to date in order the increase flexibility of air traffic flow management for flights from Southeast Asia Region flying through Afghanistan (Kabul Flight Information Region: Kabul FIR to other regions in Europe.

Continuous Descent Operations (CDO)

- Reduce 1-2 minutes of flying time per flight.
- Each flight could save 120-200 kg fuel per minute.
- Reduce carbon emission 380-630 kg per minute per flight.

Performance-Based Navigation (PBN)

- Save fuel consumption for airlines.
- Less carbon emission to the atmosphere, reduce creation of air and noise pollutions to the atmosphere.

Implementation of plans/projects to support CSR-in-Process to reduce carbon emission or greenhouse gas has continued to be carried out in many forms according to the capacity of various systems which were changed according to the aviation technology.

- **Occupational Safety and Work Environment**

  AEROTHAI realized the importance of the improvement/maintenance of all working buildings around the Country and applied the assessment criteria to participate in the competition for best establishment on occupational safety and work environment at the national level. The assessment criteria was set according to the regulations and laws on safety by the Department of Labour Protection and Welfare. In the fiscal year 2020, AEROTHAI has continued to carry out occupational safety and work environment implementation by implanting it in routine operations and completely following guidelines and laws in 3 parts which caused AEROTHAI to receive national awards from the selection of outstanding enterprise on occupational safety and work environment every year.

  AEROTHAI has drafted policy and manuals relating to occupational safety and work environment and published important information for learning, e.g. dust protection, Corona Virus Disease (COVID-19) pandemic protection, etc.

  AEROTHAI continued to receive awards of outstanding enterprise on occupational safety and work environment as it has carried out the plans, projects, routine operations, drafting policy and manuals for occupational safety and work environment. Activities relating to occupational safety and work environment were organized in all AEROTHAI's office every year. In the fiscal year 2020, the following activities were organized:

  1. Fire drill for 2020.
  2. Measurement of light intensity, noise level and air quality in workplace.
  3. Participation in competitions of outstanding enterprise on occupational safety and work environment.

Outstanding Enterprise on Occupational Safety and Work Environment

Before 2020		
Type of Awards	Workplace that Received Awards	Number of Years that Received Awards
National Outstanding Enterprise for over 10 years, consecutively	1. Head Office, Tung Mahamek	13
	2. Phitsanulok Air Traffic Control Centre	13
	3. Surat Thani Air Traffic Control Centre	12
	4. Hat Yai Air Traffic Control Centre	12
	5. Chiang Mai Air Traffic Control Centre	11
	6. Ubon Ratchathani Air Traffic Control Centre	11
	7. Nakhon Ratchasima Air Traffic Service Engineering Operations Centre	11
	8. Suvarnabhumi Airport Office	11
National Outstanding Enterprise (Gold) for 1-4 years, consecutively	1. Udon Thani Air Traffic Control Centre	3
	2. Phuket Air Traffic Control Centre	2
Provincial Outstanding Enterprise for the first year entry	Hua Hin Traffic Control Centre	3

In 2020		
Type of Awards	Workplace that Received Awards	Number of Years that Received Awards
National Outstanding Enterprise for over 10 years, consecutively	1. Suvarnabhumi Airport Office	12
	2. Nakhon Ratchasima Air Traffic Service Engineering Operations Centre	14

Remarks: In 2020, AEROTHAI entered only 2 workplaces for the Outstanding Enterprise Competition due to COVID-19 pandemic.

4. Indicator of accidents from work

For occupational safety, indicator was set at zero for accidents from work and environment for 2016-2020 as follows:

(Target : 0 accident)

Accident Location	2016	2017	2018	2019	2020
1. Head Office, Tung Mahamek	1	0	0	0	0
2. Flight Inspection Services Bureau		0	0	0	0
3. Chiang Mai Air Traffic Control Centre	1	0	0	0	0
4. Suvarnabhumi Airport Office	1	0	0	0	0
5. Hua Hin Air Traffic Control Centre	1	1	0	0	0
6. Ubon Ratchathani Air Traffic Control Centre	0	1	0	0	0

Internal Audit

The internal audit activities for the year 2020 were conducted with independence, objectivity, ethic and proficiency in accordance with the standards internal audit practices as clearly defined in the office of internal audit charter. In the past year, the Office of Internal Audit focused on enhancing the performance of the auditing unit for higher achievement in line with the Company's objectives. From internal audit's activities and process by conforming to the laws, regulations and required standards, it provided the valuable recommendations for bringing a systematic and improving risk management, control and governance processes to the audited units as well as the Company. In addition, the Office of Internal Audit also focused on internal auditors' competency development on knowledge and expertise in various areas and encouraged them to get professional certificates from well-known institutes both domestic and international.

Internal Audit Plan

In the fiscal year 2020, the Office of Internal Audit has reviewed the audit plan in order to meet the environment and developed a 5-year strategic risk based audit plan (fiscal years 2021–2025) and the audit plan for the fiscal year 2021 with highlight on the Company's objectives and strategies. By gathering the important information such as State Enterprise Performance Assessment Report on Core Business Enablers (Baseline), risk assessment and internal control report of the Company as well as stakeholders and top management's expectation, the strategic auditing plan and the 2021 auditing plan have been developed. Therefore, it can be assured that the auditing plan of the Office of Internal Audit met the Company's policies, goals and operational objectives.

Internal Audit Execution

For internal audit execution, the Office provided the assurance and consulting services as the result of its auditing execution. The stakeholders can be assured that the Company has complied with laws, regulations and Company's policy, as well as the reliability of financial information and the work systems that have impact on the goals of the Company are identified and being properly mitigated. Moreover, the Office also provided the report for the suitable maintaining of the Company's assets and the report of assessment of the efficiency and cost effectiveness for the use of resources to operate the Company's business.

For the auditing engagement activities, the auditing plan in details have been evolved by means of collecting the information and reviewed risk factors, internal controls and other significant abnormalities then apply them to set up auditing objectives, execution framework and the auditing program. The auditing report including recommendations were proposed to the audited units and executives for their further actions.

In the fiscal year 2020, the Office of Internal Audit has fully completed its auditing programme as well as the other auditing activities assigned by the Management. In addition, the Office has implemented IT technology for internal audit management to increase the efficiency and productivity of the internal audit processes.

Development of Auditors' Competencies

Competency is one of the code of ethics that internal auditors have to apply their knowledge, skills and experiences in their internal audit services. Therefore, the Office of Internal Audit promotes knowledge, skills and professionalism for the internal auditors so that they can perform their services with proficiency and carefulness in accordance with the standards and code of ethics for the professional internal audit of Thailand and the Institute of Internal Auditors' (IIA) International Professional Practices Framework (IPPF) that can boost the confidence of the audited units of their services.

Internal auditors are continuously developed and trained both internal and external including other skills necessary to perform their job efficiently. The Office of Internal Audit also promotes and encourages the auditors to acquire the various certificates in internal audit and other certificates necessary for their works. Currently, 16 of internal auditors (61.54%) are certified as professional auditors.

Financial Report

1. Report of the Board of Directors' Responsibility to the Financial Statements

The Company's Financial Report was arranged under the approval of the Company's Board of Directors to present the Company's annual financial and operating performance in accordance with generally accepted accounting standards.

The Company's Board of Directors was aware of the responsibility to prepare financial statements in compliance with generally accepted accounting standards as well as financial information presented in the 2020 Annual Report. Therefore, the Company applied appropriate accounting principles on a consistent basis with due consideration of optimal estimation in preparing the Company's financial statements. All important information was sufficiently disclosed in the notes on the Company's Financial Statements for the benefits of the Company's shareholders and stakeholders.

In addition, The Company's Board of Directors has deployed and maintained effective systems of risk management and internal controls which provided reasonable assurance that the Company's accounting records were accurate, complete and sufficient to protect the assets of the Company as well as prevent fraud or other material irregular activities.

The Company's Board of Directors monitored the preparation of financial reports by appointing the Audit Committee to oversee the quality of the Company's financial reports and internal control systems. The Audit Committee's opinion regarding such matters was disclosed under the Audit Committee's Report in this Annual Report.

In the Board of Directors' opinion, the Company's internal control systems were satisfactory and could assure the reliability of the Company's financial statements in compliance with generally accepted accounting standards, legal requirements and other associated regulations.

2. The Company's Operation Analysis – Separate Financial Statements of the Company

In the fiscal year 2020, the Company has an under-recovery or amount to be collected from Member airlines at Baht 3,426.53 million.

Unit: Million Baht

Items	2020	2019	Increase (Decrease)	
			Amount	%
Income				
Air Navigation Services	6,437.32	12,202.68	(5,765.36)	(47)
Other Related Services	776.52	839.75	(63.23)	(8)
Other Income	162.61	304.89	(142.28)	(47)
Total Income	**7,376.45**	**13,347.32**	**(5,970.87)**	**(45)**
Expenditure				
Operating Expenditure	10,797.10	12,490.01	(1,692.91)	(14)
Finance Costs	5.88	8.95	(3.07)	(34)
Total Expenditure	**10,802.98**	**12,498.96**	**(1,695.98)**	**(14)**
Overcollection to be refunded (collected) to/from Member Airlines	(3,426.53)	848.36	(4,274.89)	(504)

2.1 Income Analysis

The Company's total income in the fiscal year 2020 was Baht 7,376.45 million. This was derived mainly from income from air navigation services of Baht 6,437.32 million or 87% of total income along with income from other related services including rental and maintenance of equipment, aeronautical telecommunications services (AOC), and work orders accounting for 11% of total income or Baht 776.52 million. In addition, income from other services was Baht 162.61 million or 2%.

Actual income from air navigation services was Baht 6,437.32 million with a decrease of Baht 5,765.36 million or 47% from the previous year due to the effect of COVID-19 pandemic which led to a continuous decline in air traffic volume since February 2020. Additionally, the income has declined since the Company had to comply with the Civil Aviation Board's resolution by giving 50% and 20% discounts on Air Navigation Service Charges for domestic flights and international flights, respectively for a period of flight operations from April 2020 to December 2020. Income of Baht 776.52 million from other related services decreased by 8% or Baht 63.23 million from the previous year mainly due to a fall in income from rental and maintenance of equipment and Airline Operational Control services (AOC). The other income of Baht 162.61 million decreased by 47% or Baht 142.28 million from the previous year. This is derived from an adjusted account of state property and land rental for Air Navigation Aids NDB station in Prachin Buri which the Treasury Department retrospectively collected.

2.2 Expenditure Analysis

The Company's total expenditure in the fiscal year 2020 was Baht 10,802.98 million, of which Baht 7,989.01 million was accounted for employee benefits, Baht 2,808.09 million was other operating expenditure, and the remaining Baht 5.88 million was the finance costs. This year, the Company could reduce the operating expenditure of Baht 2,573.45 million by implementing the non-safety related cost control measures from Contingency Plan.

3. Analysis of Financial Status – Financial statements of the Company and Staff Welfare Fund

3.1 Assets Analysis

The Company and Staff Welfare Fund's total assets as at 30 September 2020 were Baht 13,602.63 million, comprised of 42% current assets and 58% non-current assets, with the following details:

Unit: Million Baht

Items	2020	2019	Increase (Decrease)	
			Amount	%
Current Assets	5,688.32	9,110.93	(3,422.61)	(38)
Non-current Assets				
- Restricted Deposit Account	123.00	123.00	-	-
- Long-Term Investments	71.70	71.70	-	-
- Long-Term Loans to Staff	8.56	4.24	4.32	102
- Buildings and Equipment	6,655.38	7,212.53	(557.15)	(8)
- Intangible Assets	111.00	122.01	(11.01)	(9)
- Assets under Construction	944.67	699.20	245.47	35
Total	**13,602.63**	**17,343.61**	**(3,740.98)**	**(22)**

In the fiscal year 2020, total assets decreased by 22% or Baht 3,740.98 million from the previous year due to a decrease in current assets by 38% or Baht 3,422.61 million, mainly derived from a decrease in temporary investment and receivables from ANS and other receivables. Moreover, non-current assets decreased by 4% or at Baht 318.37 million due to a decrease in buildings and equipment.

3.2 Liabilities Analysis

The Company and Staff Welfare Fund's total liabilities as at 30 September 2020 were Baht 12,604.78 million, comprised of 67% current liabilities and 33% non–current liabilities with the following details:

Unit: Million Baht

Items	2020	2019	Increase (Decrease)	
			Amount	%
Current Liabilities	8,282.37	11,959.29	(3,676.92)	(31)
Current Portion of Long-Term Liabilities	126.94	126.94	-	-
Non-current Liabilities				
- Children's Educational Support	0.11	0.11	-	-
- Long-Term Loans	190.19	317.13	(126.94)	(40)
- Employee Benefits Obligations	3,986.52	3,897.44	89.08	2
- Long-term provision	18.65	-	18.65	100
Total	**12,604.78**	**16,300.91**	**(3,696.13)**	**(23)**

In the fiscal year 2020, total liabilities decreased by 23% or Baht 3,696.13 million from the previous year. The current liabilities were mainly the accumulated overcollection at Baht 6,288.84 million. The Company had invested the said fund in Air navigation Service systems and others related systems between 2014-2020 at a total amount of Baht 7,474.28 million.

The non-current liabilities were mainly Employee Benefit Obligations and Long-term Loans from Government Savings Bank for investment in various projects of which repayments of principal and interests are made every 6 months.

3.3 Shareholders' Equity Analysis

The Company and Staff Welfare Fund's shareholders' equity as at 30 September 2020 was Baht 997.85 million with the following details:

Unit: Million Baht

Items	2020	2019	Increase (Decrease)	
			Amount	%
Registered Ordinary Share Capital	660.00	660.00	-	-
Staff Welfare Fund	337.85	382.70	(44.85)	(12)
Total	**997.85**	**1,042.70**	**(44.85)**	**(4)**

The capital structure as at 30 September 2020 comprised of total liabilities of Baht 12,604.78 million or 93% and shareholders' equity of Baht 997.85 million or 7%.

4. Cash Flow Analysis – Financial Statements of the Company and Staff Welfare Fund

In the fiscal year 2020, the Company and Staff Welfare Fund's ending balance of cash and cash equivalents as at 30 September 2020 was Baht 1,872.16 million, which increased from the beginning balance by Baht 78.55 million. Net cash provided by investment activities was mainly from temporary investment. Net cash used in operating activities was mainly the overcollection to be refunded to member airlines. Additionally, net cash used in financing activities was mostly for repayment of long-term loans.

Unit: Million Baht

Items	2020	2019	Increase (Decrease)
Cash Flow from Operating Activities	(2,137.08)	2,894.12	(5,031.20)
Cash Flow from Investing Activities	2,349.12	(3,855.65)	6,204.77
Cash Flow from Financing Activities	(135.04)	(136.81)	1.77
Gain (Loss) on Exchange Rate	1.55	(0.51)	2.06
Cash and Cash Equivalents - At the end of the period	1,872.16	1,793.61	78.55

5. Financial Ratio Analysis – Financial Statements of the Company and Staff Welfare Fund

In the fiscal year 2020, the Company and Staff Welfare Fund's debt-to-equity ratio decreased from the previous year due to the decrease in accumulated overcollection. Additionally, the Debt Service Coverage Ratio (an ability to pay principal and interests) derived from net cash flows from operating activities which was mainly from the higher depreciation and amortization of the completed projects.

Unit: Million Baht

Items	2020	2019	Increase (Decrease)
Debt-to-Equity Ratio (times)	12.63	15.63	(3.00)
Debt-to-Equity Ratio (times) (Excluding accumulated overcollection)	6.33	6.32	0.01
Debt Service Coverage Ratio (times)	9.77	8.74	1.03

The Company operates as a non-profit organization (cost-recovery basis). Practically, in the case of income-over-expenditure, the overcollection shall be refunded to Member Airlines. On the other hand, the Company shall collect any under-recovery from Member Airlines if there is income-under-expenditure. The Company's funds for various investments are financed by overcollection that the Company retains according to the resolution of the Ordinary General Meeting and long-term loans from financial institutions. The ability to repayment loans depends mainly on depreciation which is already included in Air Navigation Services Charges (ANS Charges) to be collected from Airlines.

Financial Trend

1. Financial Trend in 2020

The Corona Virus Disease 2019 (COVID-19) pandemic has greatly impacted the air traffic volume since 2020 and aviation industry is forecasted to slow down continuously throughout 2021. The Company predicts an 18% decline in air traffic volume from 2020 but still maintains the unit rate of ANS charges for En Route at Baht 3,500 per unit and Terminal at Baht 500 per unit.

As such, the Company expected to have a high income-under-expenditure or under-recovery amount of Baht 5,000-6,000 million in 2021. However, in order to mitigate the effect of under-recovery and improve our liquidity, the Company has implemented an overall non- safety related expenditures reduction and set a tight budgeting framework as well as adjusted cost structure to be in line with the situation.

The ceiling of the Capital Expenditure Budget in 2021 that was approved by the Cabinet on 29 September 2020 is at Baht 978.40 million. This is consistent with the Company's Corporate Plan for the years 2021-2025 which emphasized the prioritizing of investments to be consistent with current situation and postponed all non-safety related investments as well as considered the appropriateness of investment plan to ensure the continuity of safety in air navigation services and made preparation for providing services when the situation is back to normal.

2. Financial Trend in 5-year period (2021-2025)

5-year Financial Forecast (2021-2025) is consistent with the Corporate Plan for 2021-2025. The COVID-19 Outbreak has led to under-recovery continuously between 2020-2022 since main income of the Company is from Air Navigation Services which have severely been affected by the outbreak of COVID-19. According to IATA projection on aviation Industry trend in October 2020 and Thailand's air traffic demand forecast report by the Civil Aviation Authority of Thailand, aviation industry will start to recover in 2022 and resume to pre-pandemic level in 2023 or 2024 at the latest. Nonetheless, the Company has constantly implemented overall expenditures reduction measure since 2020 until 2022 to manage cost and expenses to be in line with the situation.

5-year Investment Plan and Source of Financing: According to the 5-year investment plan (2021-2025) which is consistent with the Company's Corporate Plan for 2021-2025, the limit of investment budget is expected at approximately Baht 8,000 million and will be mainly used in safety and its related services. The investment is for improvement and development of modern systems and equipment to ensure the continuity of safety services and enhance competitiveness and capacity to serve air transport of the Country such as the major investment in U-Tapao International Airport air navigation services provision project. The sources of investment include long-term loan, the Company's overcollection and other remaining working capital which the Company will ask for the approval from the Ordinary General Meeting for any future investments.

AUDITOR'S REPORT

To the Shareholders of Aeronautical Radio of Thailand Limited

Opinion

The Office of the Auditor General of Thailand has audited the accompanying financial statements of Aeronautical Radio of Thailand Limited (the Company), which comprise of the statements of financial position, as at 30 September 2020, and the consolidated statements of income and expenditure, statements of changes in shareholders' equity and statements of cash flows for the years then ended, and notes to the financial statements, as well as a summary of significant accounting policies.

In the Office of the Auditor General of Thailand's opinion, the above mentioned financial statements including the financial position of the Company as at 30 September 2020, and the financial performance and cash flows for the year then ended present fairly in all material respects according to Thai Financial Reporting Standards (TFRSs).

Basis for Opinion

The Office of the Auditor General of Thailand conducted the audit in accordance with State Audit Standards and Thai Standards on Auditing (TSAs) principles. The Office of the Auditor General of Thailand's responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of the Office of the Auditor General of Thailand's report. The Office of the Auditor General of Thailand is independent of the Company in accordance with the State Audit Standards issued by the State Audit Commission and the Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that are relevant to the Office of the Auditor General of Thailand's audit of the financial statements, and has fulfilled other ethical responsibilities in accordance with these requirements. The Office of the Auditor General of Thailand believes that the audit evidence obtained is sufficient and appropriate to provide a basis for the Office of the Auditor General of Thailand's opinion.

Key Audit Matters

The Office of the Auditor General of Thailand identified note to financial statement no. 1.2 Corona Virus Disease 2019 (COVID-19) Pandemic as the key audit matter since the COVID-19 has a direct impact on the entire aviation industry globally and Thailand. The notification of the Civil Aviation Authority of Thailand (CAAT) to temporary ban all international flights to Thailand has significantly affected the Company both current and future operating performance. Moreover, the impact cannot be accurately projected in current circumstance.

Nonetheless, The Office of the Auditor General of Thailand did not express qualified opinion on this matter.

Other Information

The Management is responsible for the other information which is information included in the annual report excepting the financial statements and auditor's report thereon. The Management agrees that the annual report is made available to the Office of the Auditor General of Thailand after the date of this auditor's report.

The Office of the Auditor General of Thailand's opinion on the financial statements does not cover the other information and the Office of the Auditor General of Thailand will not express any form of assurance conclusion thereon.

In connection with the audit of the financial statements, the Office of the Auditor General of Thailand's responsibility is to read and consider whether the other information is materially inconsistent with the financial statements or the Office of the Auditor General of Thailand's knowledge obtained in the audit, or otherwise appears to be materially misstated.

When the Office of the Auditor General of Thailand reads the annual report, if the Office of the Auditor General of Thailand concludes that there is a material misstatement, the Office of the Auditor General of Thailand is required to communicate the matter to those charged with governance.

Responsibilities of the Management and those Charged with Governance for the Financial Statements

The Management is responsible for the preparation and fair presentation of the financial statements in accordance with TFRSs, and for such internal control as the Management determines necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Management is responsible for assessing the Company's ability to continue as a going concern, disclosing matters relate to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

The Office of the Auditor General of Thailand's objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes the Office of the Auditor General of Thailand's opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with TSAs, the Office of the Auditor General of Thailand exercised professional judgment and maintained professional skepticism throughout the audit. The Office of Auditor General of Thailand also:

• Identified and assessed the risks of material misstatement of the financial statements, whether due to fraud or error, designed and performed audit procedures responsive to those risks, and obtained audit evidence that was sufficient and appropriate to provide a basis for the Office of the Auditor General of Thailand's opinion. The risk of not detecting a material misstatement resulting from fraud was

higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

• Obtained an understanding of internal control relevant to the audit in order to design audit procedures that were appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.

• Evaluated the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Management.

• Concluded on the appropriateness of the Management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty existed related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If the Office of the Auditor General of Thailand concluded that a material uncertainty existed, the Office of the Auditor General of Thailand was required to draw attention in the Office of the Auditor General of Thailand auditor's report to the related disclosures in the financial statements or, if such disclosures were inadequate, to modify the Office of the Auditor General of Thailand's opinion. The Office of the Auditor General of Thailand's conclusions were based on the audit evidence obtained up to the date of the Office of the Auditor General of Thailand auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.

• Evaluated the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represented the underlying transactions and events in a manner that achieved fair presentation.

The Office of the Auditor General of Thailand communicated with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that the Office of the Auditor General of Thailand identified during the Office of the Auditor General of Thailand's audit.

Signed

(Miss Bunloon Sirisinghsungchai)

Director of Financial and Procurement

Audit Office No.11

Signed

(Mr. Boonchai Choomsanghirun)

Auditor-Senior Professional level

Office of the Auditor General of Thailand

4 December 2020

AERONAUTICAL RADIO OF THAILAND LTD.

Statements of Financial Position

As at 30 September 2020

Unit : Baht

	Supplementary Information	30 September 2020	30 September 2019
Assets			
Current Assets			
Cash and Cash Equivalents	5.1	1,872,162,504.74	1,793,614,880.29
Temporary Investment	5.2	2,695,763,104.78	5,838,545,982.49
Receivables from ANS and Other Receivables	5.3	1,025,488,644.56	1,318,280,164.46
Short-Term Loans to Staff		15,673,873.00	12,826,471.00
Store Supplies	5.4	68,999,338.31	72,730,885.25
Other Current Assets	5.5	10,235,949.10	74,927,531.80
Total Current Assets		5,688,323,414.49	9,110,925,915.29
Non-Current Assets			
Restricted Deposit Account	5.6	123,000,000.00	123,000,000.00
Other Long-Term Investments	5.7	71,700,000.00	71,700,000.00
Long-Term Loans to Staff		8,563,033.00	4,243,856.00
Buildings and Equipment	5.8	6,655,381,287.13	7,212,532,833.17
Intangible Assets	5.9	110,996,794.47	122,005,958.23
Assets under Construction	5.10	944,667,731.35	699,199,065.34
Total Non-Current Assets		7,914,308,845.95	8,232,681,712.74
Total Assets		13,602,632,260.44	17,343,607,628.03

Notes to financial statements are an integral part of these financial statements.

AERONAUTICAL RADIO OF THAILAND LTD.

Statements of Financial Position

As at 30 September 2020

Unit : Baht

	Supplementary Information	30 September 2020	30 September 2019
Liabilities and Shareholders' Equity			
Current Liabilities			
Trade and Other Payables	5.11	388,925,128.89	1,558,730,019.67
Current Portion of Long-Term Loans	5.12	126,940,000.00	126,940,000.00
Accrued Expenses	5.13	1,371,568,515.04	85,547,878.86
Interest Payable		1,976,154.32	4,203,092.13
Short term Provisions	5.14	512,770.00	-
Accumulated Overcollection	5.15	6,288,841,088.55	9,715,370,122.78
Other Current Liabilities	5.16	230,542,101.80	595,431,114.81
Total Current Liabilities		8,409,305,758.60	12,086,222,228.25
Non-Current Liabilities			
Children's Educational Support		111,456.99	110,247.59
Long-Term Loans	5.17	190,190,000.00	317,130,000.00
Employee Benefit Obligations	5.18	3,986,523,834.33	3,897,441,969.35
Long Term Provisions	5.19	18,653,534.74	-
Total Non-Current Liabilities		4,195,478,826.06	4,214,682,216.94
Total Liabilities		12,604,784,584.66	16,300,904,445.19
Shareholders' Equity			
Share Capital	5.20		
Registered Ordinary Share Capital			
6,600,000 shares of Baht 100.00 each		660,000,000.00	660,000,000.00
Paid-in Capital			
6,600,000 shares of Baht 100.00 each		660,000,000.00	660,000,000.00
Staff Welfare Fund	5.21	337,847,675.78	382,703,182.84
Total Shareholders' Equity		997,847,675.78	1,042,703,182.84
Total Liabilities and Shareholders' Equity		13,602,632,260.44	17,343,607,628.03

Notes to financial statements are an integral part of these financial statements.

Signed

(Mr. Somnuk Rongthong)

President

Signed

(Miss Duangta Samitsuwan)

Executive Vice President (Administration)

AERONAUTICAL RADIO OF THAILAND LTD.

Consolidated Statements of Income and Expenditure

For the year ended 30 September 2020

Unit : Baht

	Supplementary Information	30 September 2020	30 September 2019
Income			
Income from Air Navigation Service Charges		6,437,322,221.65	12,202,685,050.08
Equipment rental, Maintenance and NOC income		492,097,514.61	704,895,131.24
Income from work orders		284,423,055.17	134,849,281.62
Other Income	5.22	162,605,861.16	304,886,719.40
Total income		7,376,448,652.59	13,347,316,182.34
Expenditure			
Costs of production		226,264,919.92	90,305,941.12
Supplies used		28,265,753.87	42,577,876.01
Employee Benefit Expenses	5.23	7,989,007,756.54	9,612,410,839.30
Depreciation and Amortization Expenses		1,221,561,062.34	1,196,868,569.42
Repairs and Maintenance Expenses		281,813,448.41	296,995,003.83
Assets Rental and Property Tax		228,945,242.45	252,783,272.35
Utilities and Communication Expenses		168,170,862.22	186,287,139.37
Other Expenses	5.24	653,072,419.99	811,777,219.07
Finance costs		5,876,221.08	8,948,874.75
Total Expenditure		10,802,977,686.82	12,498,954,735.22
Income-over (under)-Expenditure		(3,426,529,034.23)	848,361,447.12
Overcollection to be refunded (collected) to/from Member Airlines		(3,426,529,034.23)	848,361,447.12
Income-over- Expenditure		-	-
Other comprehensive income and expense		-	-
Comprehensive Income-over (under)- Expenditure		-	-

Notes to financial statements are an integral part of these financial statements.

Signed

(Mr. Somnuk Rongthong)

President

Signed

(Miss Duangta Samitsuwan)

Executive Vice President (Administration)

AERONAUTICAL RADIO OF THAILAND LTD.

Statements of Changes in Shareholders' Equity

For the year ended 30 September 2020

Unit : Baht

	Company	Staff Welfare Fund	Total
Balance as at 1 October 2018	**660,000,000.00**	**339,983,754.07**	**999,983,754.07**
Income-over- Expenditure - Staff Welfare Fund	-	42,719,428.77	42,719,428.77
Balance as at 30 September 2019	**660,000,000.00**	**382,703,182.84**	**1,042,703,182.84**
Balance as at 1 October 2019	**660,000,000.00**	**382,703,182.84**	**1,042,703,182.84**
Income-under- Expenditure - Staff Welfare Fund	-	(44,855,507.06)	(44,855,507.06)
Balance as at 30 September 2020	**660,000,000.00**	**337,847,675.78**	**997,847,675.78**

Notes to financial statements are an integral part of these financial statements.

Signed

(Mr. Somnuk Rongthong)

President

Signed

(Miss Duangta Samitsuwan)

Executive Vice President (Administration)

AERONAUTICAL RADIO OF THAILAND LTD.

Statements of Cash Flows

For the year ended 30 September 2020

Unit : Baht

	30 September 2020	30 September 2019
Cash Flows from Operating Activities:		
Overcollection(Under-Recovery) to Member Airlines excluding Dividend	(3,426,584,615.44)	848,299,690.22
Reconciliations of Overcollection or (Under-Recovery) as Cash Receipts or (Disbursements) from Operating Activities:		
Unrealized Loss (Gain) on Currency Exchange rate	(3,457,643.31)	703,962.72
Doubtful Accounts Expense (Adjustment)	89,484,933.49	(7,316,408.85)
Bad Debts Expense	6,883,822.76	650,105.53
Depreciation and Amortization	1,221,827,801.18	1,197,071,012.49
Assets under construction transferred to Expenses	236,011.00	478,143.15
Gain on Fixed Assets Disposal	(867,718.60)	(415,954.39)
Loss on Retirement of Assets	532,961.39	628,164.58
Deferred Income	(3,279,254.89)	(3,311,913.65)
Interest Received	(107,393,558.34)	(116,922,817.63)
Interest Expense	5,876,221.08	8,948,874.75
Employee Benefit Obligations	190,636,675.73	1,423,128,433.73
Provisions	19,166,304.74	-
Overcollection to be refunded (collected) to/from Member Airlines before any changes in Operating Assets and Liabilities	(2,006,938,059.21)	3,351,941,292.65
Changes in Operating Assets and Liabilities		
Operating Assets (Increase) Decrease		
Receivables from ANS and Other Receivables	199,101,622.64	256,210,710.65
Store supplies	3,731,546.94	28,069,803.04
Other Current Assets	64,691,582.70	(62,598,513.84)
Operating Liabilities Increase (Decrease)		
Trade and Other Payables	(1,169,737,927.58)	(43,272,978.02)
Accumulated Overcollection	-	(471,193,396.06)
Accrued Expenses	1,286,020,636.18	(158,118,986.06)
Other Current Liabilities	(367,541,328.12)	26,420,631.73
Children's Educational Support	1,209.40	1,250.81
Staff Welfare Fund	(44,855,507.06)	42,719,428.77
Cash Receipts from Operating Activities	(2,035,526,224.11)	2,970,179,243.67
Employee Benefits paid	(101,554,810.75)	(76,053,049.73)
Net Cash provided by Operating Activities	(2,137,081,034.86)	2,894,126,193.94

Notes to financial statements are an integral part of these financial statements.

AERONAUTICAL RADIO OF THAILAND LTD.

Statements of Cash Flows (continued)

For the year ended 30 September 2020

Unit : Baht

	30 September 2020	30 September 2019
Cash Flows from Investing Activities:		
Dividend Received	55,581.21	61,756.90
Restricted Deposit Account	-	(123,000,000.00)
Cash Deposit at Bank (Temporary Investment)	5,713,794,970.12	2,648,442,292.87
Cash Withdrawal from Bank (Temporary Investment)	(2,571,012,092.41)	(5,289,198,019.96)
Cash Withdrawal from Bank (Long term Investment)	-	(15,600,000.00)
Payment Received from Short-Term Loan to Staff	25,830,233.00	24,203,050.00
Cash Paid to Short-Term Loan to Staff	(19,480,608.00)	(18,322,677.00)
Payment Received from Long-Term Loan to Staff	572,235.00	318,206.00
Cash Paid to Long-Term Loan to Staff	(14,088,439.00)	(7,346,493.00)
Cash Paid for Acquisition of Assets under Construction	(894,429,463.19)	(1,185,949,630.04)
Cash Paid for Acquisition of Equipment and Software	(132,460.00)	(1,093,499.64)
Proceeds from Sale of Equipment	1,456,482.01	961,200.00
Interest Received	106,556,562.99	110,878,740.01
Net Cash provided by (used in) Investing Activities	2,349,123,001.73	(3,855,645,073.86)
Cash Flows from Financing Activities:		
Payments for Current Portion of Long-Term Loans	(126,940,000.00)	(126,940,000.00)
Cash paid to interest on loans	(8,103,158.89)	(9,870,323.60)
Net Cash provided by (used in) Financing Activities	(135,043,158.89)	(136,810,323.60)
Net Increase in Cash and Cash Equivalents	76,998,807.98	(1,098,329,203.52)
Cash and Cash Equivalents at the beginning of the year	1,793,614,880.29	2,892,457,970.32
Gain or loss on revaluation of foreign exchange	1,548,816.47	(513,886.51)
Cash and Cash Equivalents at the end of the year	1,872,162,504.74	1,793,614,880.29

Notes to financial statements are an integral part of these financial statements.

Signed
(Mr. Somnuk Rongthong)
President

Signed
(Miss Duangta Samitsuwan)
Executive Vice President (Administration)

AERONAUTICAL RADIO OF THAILAND LTD.

Notes to Financial Statements

For the year ended 30 September 2020

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1. General Information

1.1 Company's Information

The Company's objective is to provide air traffic control, aeronautical communications and related services to meet the requirements of air transport operators and the International Civil Aviation Organization's (ICAO) standards and recommended practices with safety, consistency and efficiency that is the Government's obligation to ICAO as one of the Contracting States. The Company provides services to air transport operators on a cost recovery basis. The Company recovers expenses by collecting air navigation service charges fairly from users.

1.2 Corona Virus Disease 2019 (COVID-19) Pandemic

The outbreak of COVID-19 directly affected the entire global aviation industry including Thailand and the recovery process is expected to be slow. The pandemic has a significant impact on financial and operating performance as well as a substantially decline in cash flow from operating activities of the Company this year and upcoming future. The Company has forecasted an effect that the continuously dropped in air traffic volume had on income as a result of the notification of the Civil Aviation Authority of Thailand (CAAT) to temporary ban all international flights to Thailand from 4 April 2020 until 30 June 2020 which led to flight cancellation, reduction, mergence and suspension. Also, the income has been declined since the Company had to comply with the Civil Aviation Board's resolution, at the 2nd/2020 Meeting on 13 March 2020 by providing discount on Air Navigation Service Charges for the period of flight operations from 1 April 2020 to 31 December 2020 and extending credit term so the Company provided exemption of interest charges on monthly invoices of Air Navigation Service charges, equipment rental and maintenance charges for airlines and aviation customers. As a consequence, total operating income in 2020 was lower than the forecasted amount.

Nonetheless, to cope with the impact of the outbreak, the Company has implemented several measures according to the Contingency Plan to mitigate the under-recovery impact from the decrease in income including overall expenditures reduction measure by cancelling and postponing all expenditures that are not safety-related and employee expenditures measure. However, most of the Company's operating cost are fixed cost such as employee expense, depreciation expense from equipment and system used in air navigation service as well as repairs and maintenance expense which incur on a timely basis. As a result, the Company had an under-recovery at Baht 3,426.53 million in 2020.

2. Principles for Presentation of Financial Statements

The financial statements of Aeronautical Radio of Thailand Ltd. consists of the Company financial statements and Staff Welfare Fund which have been prepared in accordance with generally accepted accounting principles of the Accounts Act, 2000 and Accounting Professional Act, 2004 as well as accounting interpretation and guidelines that have been approved by the Federation of Accounting Professions. Also, the Company's financial statements have been prepared in accordance with the announcement by the Department of Business Development regarding the brief items necessary in 2011 financial statements, dated 28 September 2011.

3. The Thai Accounting Standards (TAS), Thai Financial Reporting Standards (TFRS), Thai Standard Interpretations Committee (TSIC) and Thai Financial Reporting Interpretations Committee (TFRIC) which were announced in the Government Gazette, are as follows:

- Effective for accounting periods on or after 1 January 2020:

TAS 1 : Presentation of Financial Statements

TAS 2 : Inventories

TAS 7 : Statement of Cash Flows

TAS 8 : Accounting Policies, Changes in Accounting Estimates and Errors

TAS 10 : Events after the Reporting Period

TAS 12 : Income Taxes

TAS 16 : Property, Plant and Equipment

TAS 19 : Employee Benefits

TAS 20 : Accounting for Government Grants and Disclosure of Government Assistance

TAS 21 : The Effects of Changes in Foreign Exchange Rates

TAS 23 : Borrowing Costs

TAS 24 : Related Party Disclosures

TAS 26 : Accounting and Reporting by Retirement Benefit Plans

TAS 27 : Separate Financial Statements

TAS 28 : Investments in Associates and Joint Ventures

TAS 29 : Financial Reporting in Hyperinflationary Economies

TAS 32 : Presentation of Financial Instruments

TAS 33 : Earnings per Share

TAS 34 : Interim Financial Reporting

TAS 36 : Impairment of Assets

TAS 37 : Provisions, Contingent Liabilities and Contingent Assets

TAS 38 : Intangible Assets

TAS 40 : Investment Property

TAS 41 : Agriculture

TFRS 1 : First-time Adoption of IFRS

TFRS 2 : Share-based Payment

TFRS 3 : Business Combinations

TFRS 4 : Insurance Contracts

TFRS 5 : Non-current Assets Held for Sale and Discontinued Operations

TFRS 6 : Exploration for and Evaluation of Mineral Resources

TFRS 7 : Disclosure of Financial Instruments

TFRS 8 : Operating Segments

TFRS 9 : Financial Instruments

TFRS 10 : Consolidated Financial Statements

TFRS 11 : Joint Arrangements

TFRS 12 : Disclosure of Interests in Other Entities

TFRS 13 : Fair Value Measurement

TFRS 14 : Regulatory Deferral Accounts

TFRS 15 : Revenue from Contracts with Customers

TFRS 16 : Leases

TSIC 7 : Introduction of the Euro

TSIC 10 : Government Assistance – No Specific Relation to Operating Activities

TSIC 25 : Income Taxes – Changes in the Tax Status of an Entity or its Shareholders

TSIC 29 : Service Concession Arrangements: Disclosures

TSIC 32 : Intangible Assets -Web Site Costs

TFRIC 1 : Changes in Existing Decommissioning, Restoration and Similar Liabilities

TFRIC 2 : Members' Shares in Co-operative Entities and Similar Instruments

TFRIC 5 : Rights to Interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds

TFRIC 6 : Liabilities Arising from Participating in a Specific Market – Waste Electrical and Electronic Equipment

TFRIC 7 : Applying the Restatement Approach under TAS 29 (revised 2017) Financial Reporting in Hyperinflationary Economies

TFRIC 10 : Interim Financial Reporting and Impairment

TFRIC 12 : Service Concession Arrangements

TFRIC 14 : Minimum Funding Requirements and their Interaction TAS 19 (revised 2017) - The Limit on a Defined Benefit Asset

TFRIC 16 : Hedges of a Net Investment in a Foreign Operation

TFRIC 17 : Distributions of Non-cash Assets to Owners

TFRIC 19 : Extinguishing Financial Liabilities with Equity Instruments

TFRIC 20 : Stripping Costs in the Production Phase of a Surface Mine

TFRIC 21 : Levies

TFRIC 22 : Foreign Currency Transactions and Advance Consideration

TFRIC 23 : Uncertainty over Income Tax Treatments

The Company's Management has made an assessment of the impact caused by applying these standards and interpretations and believes that there will be no material impact on the Company's financial statements.

4. Summary of Significant Accounting Policies

4.1 Incomes and Expenditures Recognition

4.1.1 Income derived from air navigation services is recognized as income in the accounting period that services are provided.

4.1.2 Equipment rental and maintenance incomes and Airline Operational Control (AOC) income are recognized as income over the period at the rate of remuneration specified in the agreement.

4.1.3 Income from work orders is recognized as income when each order is completed and delivered to customers.

4.1.4 Interest received is recognized on time proportion basis using the actual rate of return.

4.1.5 Expenditures are recognized on an accrual basis.

4.2 Allowance for Doubtful Accounts

The allowance is recorded equal to the estimated losses that may result in collection of debts. Generally, estimations are based on the experience of debt recovery in the past and from non-governmental organizations or non-state enterprise debtors' current status at the Statement of Financial Position date. The allowance for doubtful accounts is made according to the Regulations for Account and Finance, 2005 by the Ministry of Finance as follows:

Period	Overdue Rate of Provision for Doubtful Accounts (%)
Over 6 months - 1 year	50
Over 1 year	100

4.3 Cash and Cash Equivalents

Cash and cash equivalents mean cash on hand and at bank for which repayment is due within 3 months.

4.4 Store Supplies

Store supplies are recorded at cost on the weighted average method. For overseas purchases, import formality handling charges are recorded as operating expenditure.

4.5 Investments

Investments are recorded at cost as follows:

4.4.1 Temporary investment is the investment that the Company expects to hold to maturity or converts into cash within one year such as fixed deposit account due within 12 months.

4.4.2 Other long-term investment is the investment that the Company expects to hold longer than one year such as over 12-month fixed deposit account.

4.6 Buildings and Equipment

4.6.1 Buildings and equipment are recorded at cost less accumulated depreciation.

Depreciation, the Company has depreciated the assets by using the straight-line method based on the estimated useful life of assets starting from the month the assets were available for use as follows:

Buildings and Construction	7-20	years
Utility Systems	5-20	years
Radar and Equipment	7-15	years
Power Generators	6, 20	years
Teleprinters	7	years
Equipment and Tools	7-20	years
Furniture and Office Supplies	5-7	years
Vehicles	5	years
Aircraft	5-25	years
Assets from Donations	5-25	years

Assets acquired or received with a value not exceeding Baht 30,000 are recognized as expenses.

Intangible assets prior to the year 2014 are including in furniture and office supplies.

The developments of computer system which materially enhance the capacity or efficiency as well as the acquisition of assets which provide revenue to the Company for more than one year are recognized as fixed assets.

4.6.2 Aircraft Inspection and Repair as Necessary (IRAN) are recorded at cost and depreciation is calculated using the straight-line method based on the duration of the aircraft's useful life: 5–10 years.

4.7 Intangible Assets

The amortization of intangible assets is calculated using the straight-line method of 20% per year over the asset's estimated useful life.

5.2 Temporary Investment

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Fixed Deposit Account 6 months	-	6.79	6.79	0.68
Fixed Deposit Account 8 months	-		-	6.10
Fixed Deposit Account 12 months	2,518.21	170.76	2,688.97	5,831.77
Total	2,518.21	177.55	2,695.76	5,838.55

5.3 Receivables from Air Navigation Services (ANS) and other receivables

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Receivables from ANS				
Receivable cheques	2.09	-	2.09	2.25
Airlines Debtors	1,104.03	-	1,104.03	1,352.28
Domestic Business Debtors	70.90	0.06	70.96	91.54
International Business Debtors	98.23	-	98.23	20.73
Accrued Income	43.37	0.03	43.40	39.66
	1,318.62	0.09	1,318.71	1,506.46
Less Allowance for doubtful accounts	(381.57)	-	(381.57)	(292.08)
Total Receivables from ANS -Net	937.05	0.09	937.14	1,214.38
Other receivables				
Interest Receivable	6.12	0.25	6.37	11.89
Penalty to contractors	26.41	-	26.41	25.78
Loans to staff	0.03	-	0.03	0.06
Prepaid Expenses	28.24	-	28.24	36.00
Advances to staff for expenses	0.83	26.47	27.30	30.17
Total other receivables	61.63	26.72	88.35	103.90
Total	998.68	26.81	1,025.49	1,318.28

Account receivable aging of airline customers, domestic business customers and International business customers are classified as follows:

Unit: Million Baht

	2020	2019
Airline customers		
Not over 6 months	686.63	1,082.83
Over 6 months - 12 months	148.68	(5.33)
Over 12 months	268.73	274.47
Revaluation of Account receivable due to currency exchange rate conversion	(0.01)	0.31
	1,104.03	1,352.28
Less Allowance for doubtful accounts	(343.07)	(271.81)
Total account receivable of airline customers	760.96	1,080.47
Domestic business customers		
Not over 6 months	41.26	76.51
Over 6 months - 12 months	8.48	6.72
Over 12 months	21.16	8.23
	70.90	91.46
Less Allowance for doubtful accounts	(25.40)	(11.59)
Total account receivable of domestic business customers	45.50	79.87
International business customers		
Not over 6 months	81.65	12.44
Over 6 months - 12 months	3.65	0.22
Over 12 months	11.27	8.57
Revaluation of Account receivable due to currency exchange rate conversion	1.66	(0.50)
	98.23	20.73
Less Allowance for doubtful accounts	(13.10)	(8.68)
Total account receivable of international business customers	85.13	12.05

5.4 Store Supplies

Unit: Million Baht

	2020	2019
Spare parts for Radar	31.19	31.58
Spare parts for Aircraft	20.50	18.37
Spare parts for Navigation Aids	11.05	11.40
Spare parts for Radio Equipment	2.03	6.38
Office supplies	4.07	4.26
Other spare parts	0.16	0.74
Total	69.00	72.73

5.5 Other Current Assets

Unit: Million Baht

	2020	2019
Deposit Payments	3.31	4.55
Work in Process	8.57	70.68
Output Tax	0.23	0.59
Suspense accounts	(1.87)	(0.89)
Total	10.24	74.93

5.6 Restricted Bank Deposits

The Company has opened a fixed deposit account - 12 months with Krung Thai Bank PCL at the amount of Baht 123 million as a collateral of guarantee to Revenue Department in order to postpone the penalty and surcharge payment. (Supplementary information 5.27)

5.7 Other Long-term Investments

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Vayupak Fund 1	10.00	-	10.00	10.00
Fixed Deposit Account-22 months	-	15.60	15.60	15.60
Fixed Deposit Account-36 months	-	46.10	46.10	46.10
Total	10.00	61.70	71.70	71.70

5.8 Buildings and Equipment

Unit: Million Baht

	Original Cost				Accumulated Depreciation				Book Value	
	Balance 1 Oct 19	Increase	Decrease	Balance 30 Sept 20	Balance 1 Oct 19	Increase	Decrease	Balance 30 Sept 20	30 Sept 20	30 Sept 19
The Company's buildings and equipment										
Buildings and Construction	2,993.72	2.37	-	2,996.09	2,047.84	113.32	-	2,161.13	834.96	945.88
Utility Systems	1,544.01	117.31	17.75	1,643.57	952.18	101.74	17.71	1,036.21	607.36	591.83
Radar and Communication Equipment[1/]	9,430.17	311.34	100.52	9,640.99	5,633.46	604.66	98.83	6,139.29	3,501.70	3,796.71
Power Generators	649.58	51.39	2.17	698.80	348.86	57.77	1.99	404.64	294.16	300.72
Teleprinters	0.06	-	-	0.06	0.06	-	-	0.06	-	-
Equipment and Tools	1,563.50	60.83	4.30	1,620.03	1,055.12	120.17	4.30	1,170.99	449.04	508.38
Furniture and Office Supplies	1,325.10	75.54	18.67	1,381.97	936.72	141.02	18.60	1,059.14	322.83	388.38
Vehicles	6.43	-	-	6.43	4.04	0.75	-	4.79	1.64	2.39
Aircraft	900.60	-	-	900.60	228.66	37.07	-	265.73	634.87	671.94
Assets from Donations	88.64	5.93	2.57	92.00	83.51	3.24	2.53	84.22	7.78	5.13
Total	18,501.81	624.71[2/]	145.98	18,980.54	11,290.45	1,179.71[3/]	143.96	12,326.20	6,654.34	7,211.36
Staff Welfare Fund's equipment										
Musical Instruments and Sports Equipment	4.14	0.13	0.11	4.16	2.97	0.26	0.11	3.12	1.04	1.17
Grand Total	18,505.95	624.84	146.09	18,984.70	11,293.42	1,179.97	144.07	12,329.32	6,655.38	7,212.53

Notes: [1/] Radar and Equipment comprise of radar systems, air navigation aids, surveillance systems, automatic message switching systems, and other communications equipment.

[2/] The amount is for buildings and equipment, which increased from the transfer of assets under construction at Baht 617.88 million, assets from donations at the amount of Baht 5.93 million and assets transferred between the Company and Staff Welfare Fund at Baht 0.90 million.

Buildings and construction used for operations are constructed on the State property and land which its ownership rests with the Ministry of Finance.

5.9 Intangible Assets

Unit: Million Baht

	2020	2019
Computer Software as at 1 October 2019	211.21	132.13
Add Additional during the year	30.84 [1/]	79.08 [1/]
	242.05	211.21
Less Accumulated Amortization	(131.05)	(89.20)
Total Computer Software as at 30 September 2020	111.00	122.01
Amortization – This year	41.85	37.67

[1/] the transfer of assets under construction

5.10 Assets under Construction

Unit: Million Baht

	2020	2019
Balance brought forward as at 1 October 2019	699.20	988.84
Add Additional during the year	894.43	1,185.95
	1,593.63	2,174.79
Less Transfer to Buildings and Equipment	(617.88)	(1,396.03)
Transfer to Intangible Assets	(30.84)	(79.08)
Transfer to Expenses	(0.24)	(0.48)
Balance carried forward as at 30 September 2020	944.67	699.20

5.11 Trade and Other Payables

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Trade Payable				
Trade Payable - Domestic	98.81	0.04	98.85	1,059.40
Trade Payable - Overseas	11.11	-	11.11	53.17
Suspense Account for Goods and Services	247.64	-	247.64	356.54
Total Trade Payable	357.56	0.04	357.60	1,469.11
Other Payables				
Suspense Account for Pay Cheques	4.32	1.37	5.67	19.33
Suspense Account for Debtors	20.83	-	20.83	11.36
Staff Payable	1.03	-	1.03	10.14
Deferred Income	3.63	0.17	3.80	48.79
Total Other Payables	29.81	1.52	31.33	89.62
Total	387.37	1.56	388.93	1,558.73

5.12 Current Portion of Long-term Loans due in One Year

As at 30 September 2020, the balance of long-term loans from Government Savings Bank is at Baht 126.94 million with credit limit of Baht 1,650 million. During the year, long-term loans transferred to current portion at Baht 126.94 million and the Company made repayments of principal at Baht 126.94 million.

5.13 Accrued Expenses

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Annual Special Rewards	1,282.50		1,282.50	-
State Property Land and Office Rental	28.25	-	28.25	23.26
Utilities	34.28	-	34.28	42.76
Others	19.66	6.88	26.54	19.53
Total	1,364.69	5.64	1,371.57	85.55

The Company's annual special rewards are equivalent to 4 months of salary as announced in the Company Announcement Ref. Por Kor 128/2554 on 28 June 2011 regarding the increase of annual special rewards.

5.14 Short-term Provisions

As at 30 September 2020, the Company has a short-term provision at the amount of Baht 0.51 million which arises from a warranty of work order for external entity.

5.15 Accumulated Overcollection

Unit: Million Baht

	2020	2019
Overcollection to Member Airlines - brought forward as at 1 Oct 2019	9,715.37	9,338.20
Add Overcollection to Member Airlines during the year	(3,426.53)	848.36
	6,288.84	10,186.56
Less Rebate Overcollection in 2019 to Member Airlines during the year	-	(471.19)
Balance carried forward as at 30 Sept 2020	6,288.84	9,715.37

The Company's Shareholders at the 73rd Ordinary General Meeting on 27 January 2020 approved that the Company use the overcollection of the fiscal year 2019 at the amount of Baht 848.36 million for investment in 2020 to mitigate financial risk and reduce long-term obligation of the Company.

In 2020, the Company had Baht 7,376.45 million total income and Baht 10,802.98 million total expenditure resulting in under-recovery at Baht 3,426.53 million. When subtracting under-recovery this year with the accumulated overcollection brought forward of Baht 9,715.37 million, resulting in accumulated overcollection of Baht 6,288.84 million.

In addition, income derived from telecommunication business under telecommunication license type 2 for the operator with its own network, which is amounted to Baht 68.69 million between 1 October 2019 – 30 September 2020 has already been included in Equipment Rental & Maintenance and AOC income.

5.16 Other Current Liabilities

Unit: Million Baht

	2020			2019
	Company	Staff Welfare Fund	Total	
Unearned Income	7.78	-	7.78	5.13
Accrued Income Tax and Tax Payable	56.56	0.10	56.66	408.65
Guarantee Money	166.05	0.05	166.10	169.30
Suspense Account for B Shares allocation	-	-	-	0.46
Other Suspense Account	-	-	-	11.89
Total	230.39	0.15	230.54	595.43

5.17 Long - Term Loans

Unit: Million Baht

Bank	Contract Date	Credit Limit	Duration	Transferred to loans due within 1 year	Payment during the period	Balance as at 30 Sept. 2020	Balance as at 30 Sept. 2019
Government Savings	3 Sept. 07	1,650.00	15 Y., Grace Period 2 Y.	126.94	-	190.19	317.13

As at 30 September 2020, the Company has total credit limit at Baht 1,650.00 million consisting of loans from Government Savings Bank which were used for investment in various projects. The payments of principal and interest are scheduled every 6 months.

5.18 Employee Benefit Obligations

Principal actuarial assumption for calculating provisions are as follows:

	2020	2019
Discount rate (%)	1.72	1.53
Salary increase rates (%)	7.50	7.50

The changes in present value of employee benefit obligations:

Unit: Million Baht

	2020	2019
Employee benefit obligations - Balance brought forward	3,897.44	2,550.37
Current employee benefits	190.64	1,423.12
Employee benefit paid	(101.56)	(76.05)
Remaining Employee benefit obligations	3,986.52	3,897.44

Sensitivity Analysis of Assumption for Calculation

The provision of employee benefit obligations by actuarial assumption is sensitive to the changes on assumptions used for calculation such as economic and demographic assumption under the defined benefit plan in which the change in each assumption occurs separately.

The effect of assumption changes to present value of the employee benefit obligations as at 30 September 2020 are as follows:

Unit: Million Baht

	Changes in present value of employee benefits obligations	
	Increase by 1%	Decrease by 1%
Discount rate (%)	(329.53)	380.12
Salary increase rates (%)	3.38	(4.10)

5.19 Long-term Provision

As at 30 September 2020, the Company has long-term provision at the amount of Baht 18.65 million comprises of a provision from work order's warranty to external entity at the amount of Baht 10.79 million and a provision from lawsuit at the amount of Baht 7.86 million since the Bangkok South Civil Court order the Company to pay a fine due to a breach of Management Information and Human Resource Development System installation and implementation contract. Currently, the case is under reviewing process by the Court of Appeals.

5.20 Shareholders' Equity

Unit: Million Baht

	2020	2019
Registered Ordinary Shares and paid up Share Capital		
Ordinary Shares: 6,600,000 shares; Baht 100 per share		
A-shares (held by the Ministry of Finance)	600.00	600.00
B-shares (held by Member Airlines)	60.00	60.00
Total shares	660.00	660.00

5.21 Staff Welfare Fund

Unit: Million Baht

	2020	2019
Cash and Cash Equivalents	55.22	76.75
Temporary Investment	177.55	208.85
Receivables from ANS and Other Receivables	26.81	26.09
Short-Term Loans to Staff	15.67	12.83
Other Long-Term Investments	61.70	61.70
Long-Term Loans to Staff	8.56	4.24
Buildings and Equipment	1.04	1.17
Total Assets	346.55	391.63
Trade and Other Payables	1.56	2.92
Accrued Expenses	6.88	5.64
Other Current Liabilities	0.15	0.26
Children's Educational Support	0.11	0.11
Total Liabilities	8.70	8.93
Staff Welfare Fund		
Balance at the beginning	382.70	339.98
Income over (under) Expenditure	(44.85)	42.72
Total Staff Welfare Fund	337.85	382.70
Total Liabilities and Staff Welfare Fund	346.55	391.63

5.22 Other Income

Unit: Million Baht

	2020	2019
Interest received	91.52	88.18
Gains on exchange rate	10.64	-
Dividend received	0.06	0.06
Other income	60.39	216.65
Total	162.61	304.89

5.23 Employee Benefit Expenses

Unit: Million Baht

	2020	2019
Staff Costs	6,996.07	7,349.53
Employee Benefit Expenses	190.64	1,423.12
Contribution to Provident Fund	547.72	516.89
Contribution to Staff Welfare Fund	254.58	322.87
Total	7,989.01	9,612.41

5.24 Other Expenses

Unit: Million Baht

	2020	2019
Audit Fee	1.90	3.72
Meeting Expense	10.10	46.33
Consultant and Service Fees	138.64	23.62
Public Relations Expense	20.44	33.80
Donations	20.33	23.88
Travelling Expense	91.20	268.32
Insurance Premium Fees	41.88	36.20
Other Fees	14.00	18.56
Training Expense	37.54	182.58
Store Supplies and Assets Retirement Expense	18.22	30.02
Securities Expense	71.04	67.58
Loss on Fixed Assets Retirement	0.53	0.63
Loss on Foreign Exchange rate	-	6.29
Doubtful Accounts	89.48	(7.32)
Bad Debts	6.88	0.65
Others	90.89	76.92
Total	653.07	811.78

5.25 Provident Fund

On 1 October 1992, the Company calculated the gratuity fund to be paid to staff as of that date at Baht 342.66 million. The Company transferred Baht 173.60 million to the Provident Fund. The remaining amount of Baht 169.06 million had to be transferred within 10 years and/or the remaining working period of the staff with interest at an average one year fixed deposit rate. The Company completed the transfer of all the remaining deferred gratuity funds to the Provident Fund in the fiscal year 2002.

As at 30 September 2020 there were 3,211 staff members. The Company made a contribution in this period at Baht 548.78 million to the Provident Fund, (which was recorded as staff costs at Baht 547.72 million and cost of production of work order at Baht 1.06 million).

5.26 Contingent Liabilities

The Company provides air navigation services and related services according to the agreement with the Ministry of Transport which falls in an exemption for Value Added Tax (VAT) according to the Royal Decree under the Revenue Code Regarding Value Added Tax Exemption (No. 239), B.E. 2534 (1991) as amended by the Royal Decree Issued under the Revenue Code Regarding Value Added Tax Exemption (No. 254), B.E. 2535 (1992) section 4.

Then, the Revenue Department examined the Company in overall aspects between fiscal years 2003–2011 with no issues or observations about VAT on all of the Company's income. However, in November 2013, the Revenue Department's officer examined the Company's income for fiscal year 2012 and sent an official letter of the examination results later in March 2014 that there is an issue about VAT relating to the Company's income from work orders to non-airlines customers in accounting period 2012.

After continuously monitored and coordinated with the Revenue Department officer about the issue, the Company found that the Company has tax payable relating to VAT from October 2011 to June 2018 at a total amount of Baht 234.77 million which consists of VAT at the amount of Baht 112.11 million with penalty and surcharge at the amount of Baht 122.66 Million.

However, the Company had already made a VAT payment at the amount of Baht 112.11 million to the Revenue Department on 8 August 2018. For penalty and surcharge at the amount of Baht 122.66 million, the Company sent a letter Ref. ART 1228/2561 dated 1 August 2018 to the Ministry of Finance requesting for an extension in submitting the VAT from the due date to get the exemption on penalty and surcharge. Now, The Company has already opened a Fixed Deposit Account-12 months at Krung Thai Bank PCL at the amount of Baht 123 million as a collateral of guarantee to Revenue Department in order to postpone the penalty and surcharge payment.

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