


MANAGING AIRCRAFT MAINTENANCE IN THAILAND FOR THE NEXT NORMAL

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 20 February 2023</p> <p><b>Accepted</b> 08 May 2023</p>	<p><b>Purpose:</b> This article examines the direction of aircraft maintenance management in Thailand for the new era, emphasizing the importance of safety, efficiency, and international standard certification.</p> <p><b>Theoretical framework:</b> Appropriate management of aircraft maintenance can pave the way for increased revenue and survival of airlines in the current situation.</p>
<p><b>Keywords:</b></p> <p>Managing Aircraft; Next Normal; Content Environment; Organization Management; Aircraft Resource.</p> <div style="text-align: center;">  </div>	<p><b>Design/methodology/approach:</b> This article proposes management principles to improve the aircraft maintenance process in Thailand, with the primary goals of increasing work efficiency and reducing costs.</p> <p><b>Findings:</b> Additionally, this article explores the improvement of laws and regulations related to aircraft maintenance in Thailand, considering their alignment with international standards and the prevention of environmental impacts.</p> <p><b>Research, Practical &amp; Social implications:</b> In conclusion, the management of aircraft maintenance in Thailand for the next era requires the ability to adapt to technology and scientific advancements to accommodate the increasing demands of the aviation industry. Providing training and skill development for employees in the aviation industry is crucial for achieving efficient and safe operations.</p> <p><b>Originality/value:</b> Promoting collaboration between the public and private sectors in developing and improving the infrastructure supporting aircraft maintenance is another significant factor, particularly in the development of areas for Maintenance, Repair, and Overhaul (MRO) centers and the advancement of information networks in the aviation sector.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i5.2217">https://doi.org/10.26668/businessreview/2023.v8i5.2217</a></p>

GERENCIANDO A MANUTENÇÃO DE AERONAVES NA TAILÂNDIA PARA O PRÓXIMO NORMAL

RESUMO

**Objetivo:** Este artigo examina a direção do gerenciamento de manutenção de aeronaves na Tailândia para a nova era, enfatizando a importância da segurança, eficiência e certificação de padrão internacional.

**Referencial teórico:** A gestão adequada da manutenção de aeronaves pode abrir caminho para o aumento de receita e sobrevivência das companhias aéreas na situação atual.

**Projeto/metodologia/abordagem:** Este artigo propõe princípios de gerenciamento para melhorar o processo de manutenção de aeronaves na Tailândia, com o objetivo principal de aumentar a eficiência do trabalho e reduzir custos.

**Resultados:** Além disso, este artigo explora a melhoria das leis e regulamentos relacionados à manutenção de aeronaves na Tailândia, considerando seu alinhamento com os padrões internacionais e a prevenção de impactos ambientais.

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**Implicações de pesquisa, práticas e sociais:** Em conclusão, o gerenciamento da manutenção de aeronaves na Tailândia para a próxima era requer a capacidade de se adaptar à tecnologia e aos avanços científicos para acomodar as crescentes demandas da indústria da aviação. Fornecer treinamento e desenvolvimento de habilidades para funcionários do setor de aviação é crucial para alcançar operações eficientes e seguras.

**Originalidade/valor:** Promover a colaboração entre os setores público e privado no desenvolvimento e melhoria da infraestrutura de suporte à manutenção de aeronaves é outro fator significativo, principalmente no desenvolvimento de áreas para centros de Manutenção, Reparo e Revisão Geral (MRO) e no avanço das redes de informações em o setor de aviação.

**Palavras-chave:** Gerenciando Aeronaves, Próxima Normal, Ambiente de Conteúdo, Gestão da Organização, Recurso Aeronave.

## GESTIÓN DEL MANTENIMIENTO DE AERONAVES EN TAILANDIA PARA LA PRÓXIMA NORMALIDAD

### RESUMEN

**Propósito:** Este artículo examina la dirección de la gestión de mantenimiento de aeronaves en Tailandia para la nueva era, enfatizando la importancia de la seguridad, la eficiencia y la certificación de estándares internacionales.

**Marco teórico:** Una gestión adecuada del mantenimiento de aeronaves puede allanar el camino para aumentar los ingresos y la supervivencia de las aerolíneas en la situación actual.

**Diseño/metodología/enfoque:** Este artículo propone principios de gestión para mejorar el proceso de mantenimiento de aeronaves en Tailandia, con el objetivo principal de aumentar la eficiencia del trabajo y reducir los costos.

**Resultados:** Además, este artículo explora la mejora de las leyes y reglamentos relacionados con el mantenimiento de aeronaves en Tailandia, considerando su alineación con los estándares internacionales y la prevención de impactos ambientales.

**Implicaciones sociales, prácticas y de investigación:** En conclusión, la gestión del mantenimiento de aeronaves en Tailandia para la próxima era requiere la capacidad de adaptarse a la tecnología y los avances científicos para adaptarse a las crecientes demandas de la industria de la aviación. Brindar capacitación y desarrollo de habilidades para los empleados en la industria de la aviación es crucial para lograr operaciones eficientes y seguras.

**Originalidad/valor:** Promover la colaboración entre los sectores público y privado en el desarrollo y mejora de la infraestructura de apoyo al mantenimiento de aeronaves es otro factor importante, particularmente en el desarrollo de áreas para centros de Mantenimiento, Reparación y Revisión (MRO) y en el avance de las redes de información en el sector de la aviación.

**Palabras clave:** Gestión de Aeronaves, Próxima Normalidad, Entorno de Contenido, Gestión de la Organización, Recurso de Aeronaves.

### INTRODUCTION

Since December 2019, the world has been facing the outbreak of the Coronavirus 2019 or commonly known as "COVID-19," which has had a widespread impact on businesses across all sectors. Leading consulting firm McKinsey (2020) states that from studying the value of 3,000 companies worldwide, almost every business sector has been affected by this crisis to varying degrees. The most heavily impacted industries are aviation, oil and gas, banking, and automotive and parts manufacturing, in that order. It is evident that the airline business, as one of the four major groups of the aviation industry, is a critical service in the air transportation industry. The COVID-19 outbreak has forced businesses worldwide, including Thailand, to make drastic adjustments in order to survive. Consequently, airlines have had to implement

new measures and practices to prevent potential outbreaks, resulting in new norms, or "New Normal" (Kim K, 2021). However, as the situation eases, a crucial component supporting airline services is aircraft maintenance, which ensures compliance with the Air Navigation Act, B.E. 2497 (Amended B.E. 2562), and the Standards and Recommended Practices (Annex 6, Operation of Aircraft) that mandate the maintenance of various components based on their condition and usage (Civil Aviation Authority of Thailand, 2023). Subsequently, the world has entered the "Next Normal" era, and the question arises as to how the aircraft maintenance industry will adapt. This industry consists of almost all airline activities, aircraft manufacturing and research companies, military aviation and more, as well as many other activities that help facilitate air travel. (Izatul and et al., 2023).

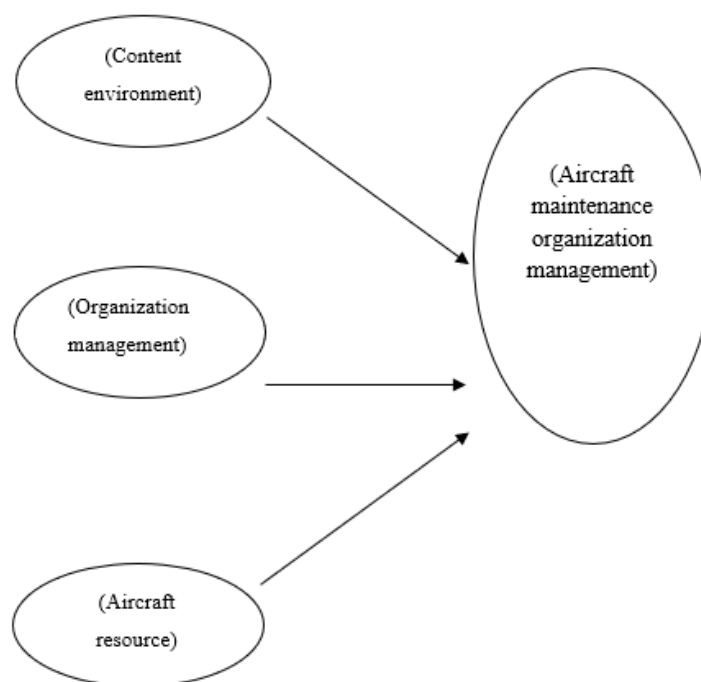
### **RESEARCH OBJECTIVE**

This article examines the direction of aircraft maintenance management in Thailand for the new era.

### **MANAGING AIRCRAFT MAINTENANCE IN THE NEXT NORMAL**

Effective management of aircraft maintenance can enhance service quality and create a competitive advantage for aircraft maintenance businesses. The ability of organizations to provide high-quality aircraft maintenance services that meet customer needs is something that each airline or aircraft maintenance organization should develop to align with the new normal (Next Normal) following the crisis. Appropriate management of aircraft maintenance can pave the way for increased revenue and survival of airlines in the current situation. Factors to consider when managing Thai commercial aircraft maintenance organizations should consist of three aspects and 14 factors, divided into context and environment with six factors, organizational management with three factors, and resources with five factors, which will affect the management of aircraft maintenance organizations (Thianthong T, Siriwoharn T, and Klangphahol K, 2021).

Figure 1 Research conceptual framework



Source: Prepared by the authors (2023).

## COMPONENT

### Content And Environment

1. Content and Environment for Aircraft Maintenance, Repair, and Overhaul (MRO) are essential components of the aviation industry to ensure safety, reliability, and efficiency of aircraft. In order to create an effective learning environment for MRO experts, it is necessary to consider relevant context and suitable environment, which can be further divided into subcategories, such as Government Policy on Aviation, Availability, Aircraft Maintenance Capability, Economic Condition, Aviation Regulation and Standards, and Company Policy. (Khosantia, N, 2019; Ahmad, Z. S., Harun, N., & Shuhaimi, H, 2015)

1.1 Government Policy on Aviation for MRO experts requires an understanding of the rules, regulations, and practices set by international and national agencies, such as the FAA (Federal Aviation Administration), EASA (European Union Aviation Safety Agency), and ICAO (International Civil Aviation Organization), which provide information on standards, procedures, and certifications related to the aircraft maintenance industry. In Thailand, relevant agencies must seriously support these policies and implement them earnestly. When the concerned agencies prioritize and urgently establish such policies, it will lead to the proper growth of the aircraft

maintenance industry in Thailand, enhancing capabilities in creating comprehensive maintenance facilities and potentially becoming a regional hub for maintenance services.

1.2 Aircraft availability is crucial for the efficiency of aviation organizations. MRO plays a significant role in increasing aircraft availability, ensuring they can operate according to the scheduled timetable, preventing potential damages, reducing risks of accidents or delays related to aircraft damages, and extending the aircraft's service life. This allows aviation organizations to use their aircraft for more extended periods, reducing costs for purchasing new aircraft.

Therefore, aircraft maintenance facilities in Thailand must be ready to support the maintenance needs within the country, reducing the need to send aircraft abroad for repairs. If MRO providers develop their capabilities to meet the needs of airlines, they will create opportunities for the country and reduce the costs for airlines. Moreover, this will have positive effects on airline passengers by offering more affordable travel options.

1.3 Aircraft maintenance capability is crucial for providing services and managing aircraft operations. This capability is vital for ensuring safety, operational efficiency, and aircraft availability. For the aircraft maintenance industry in Thailand, the capability to perform maintenance must be certified by the Civil Aviation Authority of Thailand for aircraft registered as Thai nationals or by the safety regulatory agencies of the aircraft's country of nationality. Furthermore, they should comply with European Aviation Safety Agency (EASA) regulations and the United States Federal Aviation Administration (FAA) safety standards.

1.4 Economic conditions have a significant impact on the MRO industry in various aspects. For instance, when the economy is growing, travel and transportation of goods by aircraft increase, leading to higher demand for maintenance and repairs. In an unstable economic environment, airlines will try to find ways to reduce costs, possibly opting for cheaper MRO services or postponing aircraft upgrades to save expenses.

The global and Thai economic trends are important for managing commercial aviation maintenance organizations in Thailand, particularly for investing in comprehensive aircraft maintenance centers and MRO Common Use facilities that rely on a recovering economy from the slowdown caused by the COVID-19 pandemic.

It is evident that aircraft usage requires continuous maintenance, whether the aircraft is in operation or not, to ensure its functionality and compliance with maintenance standards set

by controlling and regulatory agencies. This is crucial for ensuring maximum safety for passengers and the proper operation of aircraft.

1.5 Aviation regulation and standards are crucial in the aviation industry to ensure safety and efficiency. Organizations involved in establishing these standards include IATA (International Air Transport Association) and ICAO (International Civil Aviation Organization), which set global aviation standards.

Aviation regulations and international standards are essential for managing commercial aviation maintenance organizations in Thailand. Adapting and updating regulations and standards for aircraft maintenance to align with international safety standards is a significant change for Thailand. This alignment allows the country to achieve aviation safety standards that are recognized and accepted by other nations and enables Thailand to compete globally in the future.

By adhering to international regulations and standards, Thai aviation organizations can ensure the highest level of safety and efficiency in their operations. This, in turn, will help the industry to maintain a positive reputation, attract more business, and contribute to the overall growth of the Thai aviation sector.

1.6 Company Policy plays a crucial role in improving the efficiency and safety of an organization's aviation operations. Organizations should have clear policies regarding aircraft maintenance, specifying the level of maintenance capability they aim to achieve and which certifications they seek from relevant authorities. Research has found that most airlines in the country are currently allowed to perform maintenance at the parking apron level, except for Thai Airways International (Public) Co., Ltd., which has its own maintenance center. However, the organization is currently facing a crisis, which has resulted in a decreased ability to accommodate customers.

## **Organization Management**

2. Organization management is crucial for effectively managing and controlling the quality of aircraft maintenance work. It is essential to establish clear policies and procedures, adhere to standards and regulations, and promote communication and cooperation between different departments involved in MRO, such as maintenance, transportation, and information services. Key factors in organizational management can be further divided into subcategories, including staffing, controlling, and planning.



(Barney, J. B., Wright, M., & Ketchen Jr., D. J., 2001; Creswell, J. W., & Plano Clark, V. L., 2018; Mottaeva, A., 2018).

2.1 Staffing in human resource management is crucial for organizations in the aircraft maintenance sector, as employees should possess competencies that meet international standards and comply with the regulations of the Civil Aviation Authority of Thailand. Organizations must provide training for their employees to strictly follow maintenance procedures and manuals, and further develop their skills to enhance their professional growth continuously. It is essential to improve the quality of aircraft maintenance personnel comprehensively and collaborate with airlines to develop their workforce, leveraging government policies to support operations, laws, and practices related to aircraft maintenance. Regulations regarding training and skill development for personnel must be clear and well-defined to ensure effective implementation and alignment with the organization's goals.

2.2 Controlling in the aircraft maintenance industry is a crucial process for monitoring and controlling work progress, ensuring compliance with policies and regulations. Supervising personnel to work according to the plan is an essential factor for achieving on-time performance and meeting safety and quality standards. Organizations must use quality control systems to manage the work of aircraft maintenance operators in accordance with the organization's standards, certified by the Civil Aviation Authority. Each organization must set goals for aircraft maintenance quality and standards to be achieved, such as scheduled maintenance or reducing aircraft downtime during maintenance. Moreover, criteria must be established to measure the performance of aircraft maintenance units using Key Performance Indicators (KPIs) to evaluate efficiency and effectiveness, as well as regularly monitoring and tracking the progress of MRO tasks.

2.3 Planning in the aircraft maintenance industry is an essential process for managing maintenance tasks to ensure safety, efficiency, and cost control. Organizational planning for aircraft maintenance requires forecasting to reserve maintenance facilities in advance, allowing airlines to plan ticket sales accurately. Planning also includes appropriate human resource allocation, ensuring maximum quality and efficiency in aircraft maintenance.

Planning for aircraft maintenance involves scheduling based on time or aircraft usage, which includes checking readiness, replacing parts, and testing various systems. Planning for

repairs when damage occurs or aircraft upgrades to improve performance and safety, such as installing new systems or replacing engines, is also essential. Additionally, planning should involve cost control, considering expenses such as purchasing parts, labor costs, and more.

### **Aircraft Resources**

3. Resources are crucial in the operation of the aircraft maintenance industry, which involves the process of maintaining aircraft. Efficient resource management can help MROs (Maintenance, Repair, and Overhaul) improve their performance, control costs, and enhance flight safety. These resources can be categorized into several subcategories, such as people, market, motivation and morale, money, and machinery. When combined, these elements create a model that can impact the management of organizations in the aircraft maintenance industry. (Ratchakit, T. 2019, Ghezzi, A., Rangone, A., & Balocco, R., 2013; Anvari, F., & Edwards, R., 2011)

3.1 Human resources (Man) are a primary resource in the aircraft maintenance industry because, in addition to utilizing advanced technology for management, decision-making by skilled individuals is essential for maintaining safety standards. Therefore, workers need to have knowledge, expertise, and a clear understanding of their tasks. As a result, it is necessary to plan for the recruitment and development of personnel with the skills needed for MRO operations. This can improve efficiency and safety in the workplace. The connection between human capital masters and skill innovation efficiency for the scenario of viewers' shifting circumstances. Product innovation might start with the skill and experience gained and permitted to keep information on the usage of new knowledge (Kritsana and et al, 2023).

3.2 Market refers to the marketplace that encompasses maintenance, repair, and overhaul activities for aircraft. This market consists of various organizations providing services, competing with each other to establish relationships and trust with airlines, aircraft manufacturers, and other relevant operators. Marketing is a crucial factor for aircraft maintenance organizations, especially for new MRO operators who need to promote their company's recognition and understanding of Thai aircraft maintenance standards, comparable to global standards. It is essential to demonstrate the capabilities of the maintenance unit, showing the level of service they can provide.

In particular, creating a positive impression or customer satisfaction will help encourage customers to return for repeat services.



3.3 In the context of MRO, motivation and morale refer to encouraging and supporting employees within the MRO organization to be enthusiastic, capable, and willing to work efficiently in maintaining, repairing, and overhauling aircraft. Airlines and MRO operators have processes in place to boost employee morale, fostering loyalty and dedication to their organization and tasks. Furthermore, promoting morale among personnel within the organization will help foster cooperation, ensuring maximum efficiency and adherence to aviation safety standards.

3.4 Financial management in aircraft maintenance is crucial, as it affects the organization's efficiency and expense management. Financial measures for MRO are universally applied in budget allocation, as airlines calculate maintenance costs using international standards. This requires systematic financial control and expense monitoring related to maintenance, as well as clear planning. Additionally, analyzing the return on investment in equipment, infrastructure, and employee development is essential for making effective decisions to improve and expand MRO activities.

Moreover, it is necessary to assess the risks associated with changes in the aviation market, fuel prices, and currency volatility. This helps the MRO organization anticipate potential challenges and develop strategies to adapt to fluctuations in the market, ensuring financial stability and the ability to continue providing high-quality maintenance services.

3.5 Mechanical systems in the context of MRO refer to the systems and equipment used for maintaining, repairing, and upgrading aircraft, as well as the mechanical systems installed within the aircraft itself, such as landing gear systems, propulsion systems, and hydraulic systems. Managing mechanical resources or tools for MRO to ensure they are sufficient and up-to-date is a crucial factor in achieving efficient maintenance operations.

## **ANALYSIS RESULT**

Aircraft maintenance organizations place importance on managing the tools and equipment used for maintenance to ensure they are always ready for use. This includes providing training and skill development for personnel in mechanical systems, both in terms of repair and maintenance, as well as the proper use of tools and equipment. Furthermore, maintenance planning for mechanical systems must be done according to necessity and manufacturer recommendations to ensure safety and risk control. This corresponds to Peter K., Patrik S., Michal V. & Jan L. (2023) with the statement that MRO management has become

increasingly complex due to business growth. Therefore, MRO management requires the retention of technically skilled employees, which is one of the many challenges. Evaluating and analyzing the efficiency of mechanical systems, as well as repair and maintenance processes, helps to identify areas for improvement and develop better ways of working. By investing in modern tools and equipment, providing comprehensive training, and establishing well-planned maintenance procedures, MRO organizations can enhance the quality of their services, ensure aircraft safety, and reduce the associated risks.

## CONCLUDE

In conclusion, managing aircraft maintenance in Thailand for the next normal requires a multifaceted approach that addresses both the immediate and long-term challenges faced by the aviation industry. This entails adopting new technologies, improving workforce capabilities, enhancing safety and quality standards, and maintaining a strong focus on sustainability. By fostering collaboration between the government, aviation stakeholders, and global partners, Thailand can create a robust and resilient aircraft maintenance sector that thrives in the next normal and beyond. This will not only promote the country's economic growth but also ensure the safety and efficiency of air travel for millions of passengers.

## REFERENCES

- Ahmad, Z. S., Harun, N., & Shuhaimi, H. (2015). Using technological, organizational, environment framework to investigate the determinants of the adoption of electronic publishing amongst Malaysian publishers. *Aust. J. Basic & Appl. Sci.*, 9(3), 37-44.
- Anvari, F., & Edwards, R. (2011). Maintenance engineering in capital-intensive manufacturing systems. *Journal of Quality in Maintenance Engineering*, 17(4), 351-370.
- Barney, J. B., Wright, M., & Ketchen Jr., D. J. (2001). The resource-based view of the firm: Ten years after 1991. *Journal of Management*, 27(6), 625-641.
- Civil Aviation Authority of Thailand. (2023). *Air Navigation Act (Revised Version 2019)*. Bangkok : CAT
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Los Angeles : SAGE Publications, Inc.
- Ghezzi, A., Rangone, A., & Balocco, R. (2013). Technology diffusion theory revisited: a regulation, environment, strategy, technology model for technology activation analysis of mobile ICT. *Technology Analysis & Strategic Management*, 25(10), 1223-1249.

Izatul H. Z. and et al. (2023) "Preparation of aviation industry transition on COVID-19 from pandemic to endemic phase: a review". *International Journal of Professional Business Review*. Vol. 8 No.4 : 1-20.

Khosantia, N. (2019). Thailand's Strategic Guidelines in Developing Aircraft Maintenance, Repair and overhaul industry. Desiertation, Doctor of Philosophy Program in Public enterprise management, Graduate School of Commerce, Burapha University, Chonburi. (In Thai)

Kim, K. (2021). Impacts of COVID-19 on Transportation: Summary and Synthesis of Interdisciplinary Research. *Transportation Research Interdisciplinary Perspectives*. 9(100305), 1-4.

Kritsana L. and et al. (2023) "Guidelines for the growth of SMES in the Thai Sports Industry". *International Journal of Professional Business Review*. Vol. 8 No.5 : 1-14.

McKinsey & Company. (2020). *COVID-19: Briefing Materials, Global Health and Crisis*. Retrieved from <https://www.mckinsey.com/~/media/mckinsey/business%20functions/risk/our%20insights/covid%2019%20implications%20for%20business/covid%2019%20july%209/covid-19-facts-and-insights-july-6.pdf>.

Mottaeva, A. (2018). Formation of mechanism of programme management for the development of medical organizations. In *MATEC Web of Conferences* (Vol. 170, p. 01053). EDP Sciences.

Ratchakit, T. (2019). *POCCC Management Theory and Principles of Enterprise Management for Success Based on Henri Fayol Concept*. Retrieved March 10, 2019, from <https://th.hrnote.asia/orgdevelopment/190626-poccc-henri-fayol/> (In Thai)

Thianthong, T, Siriwoharn, T and Klangphahol, K. (2021). "Management of Aircraft Maintenance Organizations in Thai Commercial Aviation Industry". *NRRU Community Research Journal*. Vol.15 No.3 : 158-172.