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The Study of Factors in the Management of Aircraft Maintenance Organizations in the Thai Commercial Aviation Industry

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Abstract

This research was aimedat findingfactors in the management of aircraft maintenance organizations in the Thai commercial aviation industry.Qualitative research was used by means of a structured interview form to collectdata from in-depth interviews with fourteenaircraft maintenance expertswho were chosen by purposive sampling. These included government, international organizations, executives of aeronautical engineering associations and executives of Thai airlines who are responsible for aircraft maintenance.Then the emphasis and coherence of data were analyzed.Theresults revealed that the management ofaircraft maintenance organizations in the Thai commercial aviation industry havethree key factors: context andenvironment, organizational management and organizational resources.

Keywords: Organizational Management; Aircraft Maintenance; Commercial Aviation Industry

Introduction

Air transport contributes to the economic added value of city connectivity and connectivity to new markets, resulting in increased infrastructure investment. This results in foreign investment in various cities causing an economic integration impact on the expansion of economic output as a report by Oxford Economics (2011) indicates, Thailand's aviation industry generates the gross national product to the value of 139,000 million baht or 1.50 percent of the total gross national product. While most investors are more concerned with the airline business' revenue, businesses that play a vital role in supporting services like aircraft maintenance have not received much attention. However, an aircraft is no different from other vehicles in that they require maintenance of parts according to their condition and service life. Besides, airplanes are complex and technologically advanced vehicles, making maintenance costs 12% to 15% of aviation revenue. Comparatively, a bus's maintenance value is only 3% to 5% of the fare revenue. It is predicted that in the next twenty years, 50% of the world's

air traffic will be concentrated in the Asia-Pacific countries, and the number of aircraft will increase by more than 14,000, meaning the maintenance needs of the aircraft will be a small increase as well, but nowadays, most aircraft maintenance centers are located in North America and Europe. The government sector, therefore, has a national strategy, 2018-2580 to build competitiveness in the industry, and transportation and logistics to develop the aerospace industry to support the growth of the sector and related services, by upgrading aircraft maintenance services to promote transport under the Thai context,making aircraft maintenance businessanother business in the aviation industry that must be watched in the future (SupreeSrisamran, 2017)

Aircraft maintenance management is no different from maintaining equipment or other sizeable mechanical work systems. People responsible for all maintenance work should know aircraft maintenance management, including fundamental insights, goals, and objectives. The Civil Aviation Organization is determined to include the public and private sectors related to aircraft maintenance, the development of aircraft maintenance programs, systems, departments, and activities necessary for aircraft maintenance management Aircraft maintenance workers are also required to apply the knowledge and skills that are learned on the training course, the knowledge handbook gained from work experience. It requires exchanging information with colleagues throughout the work so as not to make errors in aircraft maintenance and in order to complete the maintenance on time (IssarapSalee, 2013). Efficient aircraft maintenance will improve service quality and differentiate the aviation business from the competition. Improving the quality of aircraft maintenance services that meet users' needs is something that each airline or aircraft maintenance organization should develop to increase customer satisfaction (PanusakSawangboon). Therefore, aircraft maintenance is an essential task as all airlines have to comply with maintenance standards to ensure the aircraft's safety in air navigation according to the airline's use. Therefore, every aircraft has to be serviced for a specified period. It can be categorized according to the flight hours before the maintenance and the maintenance's complexity into three aspects: 1) sub-maintenance or repair in the aircraft hangar, consisting of the inspection of various aircraft systems before and after take-off:a daily A-check and B-check 2) Major repair yearly (C-check) consisting of three parts: disassembly work,parts maintenance work and assembly work (PhattharawitSrimuang, 2011).This is a replacement of spare parts and a thorough inspection in both the structure and surface of the aircraft, takes 1 to 2 weeks and takes up more inspection space than sub-maintenance and 3) heavy repairs (D-check), which is the disassembly of the plane to be examined. These repairs take place every 4 to 6 years and take 1 to 1.5 months to complete. This is complex technology and the most increased investment cost,but it also generates the highest income for aircraft maintenance operators (SupreeSrisamran, 2017).

However, external and internal factors are still things that administrators should take into account in the development of the organization, whether it is the management of the organization or personnel of the aircraft maintenance center, to maintain the quality and safety standards, which is the key to repair. Maintenance of aircraft and profit from business operations allows efficiency and develops competitiveness to survive in all conditions and through all changes economic, social, and technological. Therefore, aircraft maintenance organization management is a problem that needs to be answered in both domestic and international business operations and abroad, especially during the global economic slowdown,which has significantly reduced air travel. Therefore, the researcher is interested in studying and developing aircraft maintenance organization management of the modern Thai commercial aviation industry in line with the context of the Thai economy and society. It can be a guideline for commercial airlines to be used as information in considering management of an aircraft maintenance organization. Setting up an aircraft maintenance center (Maintenance Repair and Overhaul: MRO) to be able to maximize the benefits of business operations would reduce obstacles to managing the Thai commercial aviation industry's aircraft maintenance organization and allow it to be more competitive internationally.

Research objectives

A study of the critical elements of aircraft maintenance organization management of the Thai commercial aviation industry

Research method

1. Key Informants and Selection Criteria.

This study uses an in-depth interview with aircraft maintenance professionals,experts from government agencies on regulations and policies for aircraft maintenance in Thailand,experts from the world-class organization who set international aviation standards related to aircraft maintenance, the Executive Association of Air Engineers and airline executives in charge of aircraft maintenance in Thailand, totaling fourteen people, chosen specifically (Purposive Sampling) according to the specified qualifications, including having at least ten years' experience in the aviation industry and having experience in the field of aircraft maintenance.

2. Tools for data collection.

This research is qualitative research carried out by interviewing management groups and aircraft maintenance experts. The research tool is a structured in-depth interview, where the researcher has created a line of questions which accord with the research objectives as a guide for interviewing informants.

3. Data analysis.

The researchers analyzed the interviewed data by using the recorded data. During the interview, the audio cassette transcription was separate, useful and coveredrelevant issues for the research objective. The researchers considered the completeness of the information obtained and sought additional information to ensure the most complete information possible.

Research results

By analyzing the data obtained from the interviews, the researchers analyzed the three vital elements of the Thai commercial aviation industry's aircraft maintenance organization management: context and environment.management organization and organizational resources with details as follows:

1. Environmental context can be broken down into six issues:

1.1 Economic conditions affected the Thai aviation industry's aircraft maintenance department, such as the economic recession, such as the COVID-19 epidemic, which affects aircraft travel and the income of operators. That is why many airlines have chosen to adopt a downsizing method in order to manage expenses in a balance with limited income

1.2 Aviation Regulation & Standards set by the Civil Aviation Authority of Thailand (EXAT), which cover the examination of management site maintenance personnel, methods of maintenance facilities, tools, equipment, materials, and information used in aircraft maintenance It is an international standard recognized around the world, both in terms of operations and safety

1.3 Government Policy on Aviation. The government sector encourages aircraft maintenance in the Thai Airways industry, such as airport development. Utapaois to be a commercial airport developing the Eastern Economic Corridor (EEC) to drive it as a maintenance center and support the development of personnel involved in aviation at the tertiary level.

1.4 Company policies relate to the Thai aviation industry's aircraft maintenance department, such as the safety policy,punctuality, economy, emphasis on recruiting and charging the organization with exact duties and responsibilities. The operator doing the maintenance must have a Ground Engineer’s License issued by the Civil Aviation Authority of Thailand.

1.5 Capability Overall. Thailand has sufficient aircraft maintenance potential. Maintenance personnel have the knowledge, capability, expertise, and readiness to perform aircraft maintenance work.

1.6 Availability is another critical factor that will enhance the competitiveness of aircraft maintenance organizations in Thailand. The organization must pay more attention to its evaluation and preparation, according to the needs of the customer, to increase its competitiveness and market share.

2. Organization management can be broken down into five issues:

2.1 Planning for aircraft maintenance; there must be systematic planning and compliance with safety standards. Planning for the Thai aviation industry's

aircraft maintenance organization must meet the minimum requirements set by the Civil Aviation Authority of Thailand.

2.2 Organizing so that the organization can cope with the change in a timely manner. A good organization should not be too complicated. The organization of most aviation businesses can be divided into three central departments: flight operations department,aircraft engineering and the maintenance department and the commercial and marketing department

2.3 Human resource management (Staffing). Due to the epidemic of COVID 19, the allocation and management of personnel should be in a form that is always ready for change, such as the downsizing of the organization. Modification or expansion of duties and responsibilities means that personnel must have a wide range of potential to cope with this change,human resource management that will effectively affectthe survival of the organization.

2.4 Directing must be coordinated, planned and targeted. Performance indicators are defined through various goals and the implementation of the plans and the timeline. There are many parts to directing the aircraft maintenance agency, such as hiring skilled and licensed operators,equipment rental,providing services according to industry standards, controlling and maintaining quality maintenance

2.5 Controlling the aircraft maintenance department by strictly following the manual, regulations, and aviation standards under the Civil Aviation Authority of Thailand;ensuring the quality control and complying with international standards. This results in safety for both operators and service users and also creates satisfaction for the passengers who use the service.

3. Organizational resources can be broken down into eight issues:

3.1 People are critical in an aircraft maintenance organization. Management should assess and calculate human resources to suit the scheduled repair cycle's maintenance duties and responsibilities. They should take into account the necessary educational qualifications for the occupationand match the assigned work to create a channel for the development of personnel.

3.2 Money is one of the essential aspects of maintenance organization management. In aircraft maintenance, large capital is required to manage raw materials, spare parts, personnel, and the purchase of imported equipment as appropriate.

3.3 Raw materials, spare parts and parts (Materials) are essential to the aircraft maintenance industry. It is a crucial part of driving the aircraft maintenance process to achieve results so that the aircraft can continue to be used.

3.4 Methods:the aviation industry has rules and international standards that must be followed to control the quality of aircraft to ensure the safety of service users and the aircraft operator.

3.5 Machine tools (Machine) are a crucial component in aircraft maintenance. The aircraft maintenance organization must provide adequate tools and

machinery for the aircraft maintenance staff to be able to perform maintenance work without defects or interruptions.
3.6 The market (Market) is vital to the aircraft maintenance organization because the aviation industry in Thailand is highly competitive. Therefore, it should give great importance to the standard and quality of maintenance. Comprehensive maintenance,repair price,period of maintenance,on-time delivery,modern technology and meeting the needs of customers are all essential.
3.7 Morale: creating morale for personnel will improve the organization's productivity from the employees' work. The organization may use pre-employment training to make workers feel more confident,understand their work,be more effective and develop a love for their career as well as listening to other opinions. The executives should participate in making workers believe in what they are doing, feel proud and that they are part of the organization.It is the responsibility of executives to build morale and take care of employees, both at the organizational and policy levels.
3.8 Time is required for maintenance organizations to plan a precise schedule andcover any problems that may arise. Keeping the program on schedule, meeting the standards, and determining supervisors' decision-making power appropriately for flexibility in solving immediate problems are all necessary. Delayed deliveries can result in additional planned costs and lessen the credibility of the organization.

Discussion of research findings

1. The context and the environment are the surrounding conditions. The conditions of the aircraft maintenance organization, both internal and external, include economic conditions,aviation regulations and standards, Government Policy on aviation organization policy,aircraft maintenance capabilities and availability consistent with ChaiwutTangsomchai (2014) on the operations and the impact of the business environment on small and medium enterprises in Chiang Mai province's maintenance service. It was affected by the external environment with factors affecting operations. By analyzing the general environment, namely political and legal, economic, social, cultural, and technological, the maintenance service businessfunction is affected by the overall environment outside the company at a moderate level. The sub-factor for the external environment's impact on a large number of people is the national economy, taxation, collecting taxes, and the local economy, respectively. In line with NittiyaKhosanthia (2019) on the strategic development of the aircraft maintenance industry in Thailand, the context of the aircraft maintenance industry must be consistent with the supporting factors. The 12th Economic and Social Development Plan (2017-2021) becomes an aircraft repair center that requires cooperation between the public, the government and businesses using public policy to increase the effectiveness of measuring the aircraft maintenance

work's success. The strategy for developing the aircraft maintenance industry that is effective and most beneficial to the nation is to create the potential of the relevant personnel,The strategy includes implementation of aircraft maintenance infrastructure and facilities, to build a strategic partnership to develop cutting-edge technology,to organize a working group on policy and strategic alliances with national aviation-related agencies. There must be investment management with the government as a mainstay and regulators certifying aviation standards to be equivalent to international standards.

2. Organization management is the process of managing a group of people in an organization to work together effectively and achieve organizational objectives, including planning and organizing. Human resource management, governance, and control need to align with NarisaraChinavanij (2019) on airline aircraft maintenance management. Low costs in Thailand found that aircraft maintenance management guidelines must be in accordance with the management process starting with planning,organization, assignment, direction and control of work to achieve the objectives and goals of low-cost airlines that require efficient maintenance of aircraft by making the most of available resources. In accordance with AraweewanKomolratwattana (2014), a model for developing the capacity of senior executives in administration to increase competitiveness in the alcoholic beverage industry, it was found that the strategic management potential consisted of four elements: planning,control and evaluating leadership and organization results in line with Chang & Kora (2014), The Operation Management Model of Aircraft Maintenance, Repair and Overhaul (MRO) Business, which stated that the management processes of the aircraft maintenance business include operational planning, evaluation, and improvement.

3. Organizational resources are elements in implementing the organization's mission to achieve its objectives effectively and efficiently, including people, money, materials, methods, tools, markets, morale, and time of operation. In line with ChontichaSitthiwong (2016), factors affecting Thai state enterprises' competitiveness in the AEC found that internal factors were related to Thai state enterprises' competitiveness in the community. In order for ASEAN economies to have success in airline operations,they need tosort their relative levels from goods or materials used to make goods, machinery, tools and office equipment, management of resources, funds, morale of personnel and personnel, respectively, in line with Saowaluck, Jamjamroon and NisakornSomsuk (2016).Nok Air found that the most critical success factor is human resources. A group of management resources followed them. The most important indicators of the success of aviation operations are operational safety, followed by operational efficiency. Al Rawahi, Jamaluddin & Bhuiyan (2020), on the conceptual framework for the resources management,describedaircraft maintenance efficiency in the aviation industries in Oman and stated that planning and effective internal controls play a more significant role in the relationship between

resource management characteristics and aircraft maintenance efficiency in Oman's aviation industry.

Suggestion

1. There should be a study of strategic management in order to enhance the organizational administration of aircraft maintenance.
2. There should be a development of a technology system to support the management of aircraft maintenance organizations in order to be able to supervise the management to be more efficient.
3. There should be a development of an aircraft maintenance organization management model under critical conditions.
4. There should be a network of cooperation between relevant organizations or agencies to exchange ideas and knowledge on aircraft maintenance.

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