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Implementation of Safety Management System at Halim Perdana Kusuma Airport During the COVID-19 Pandemic

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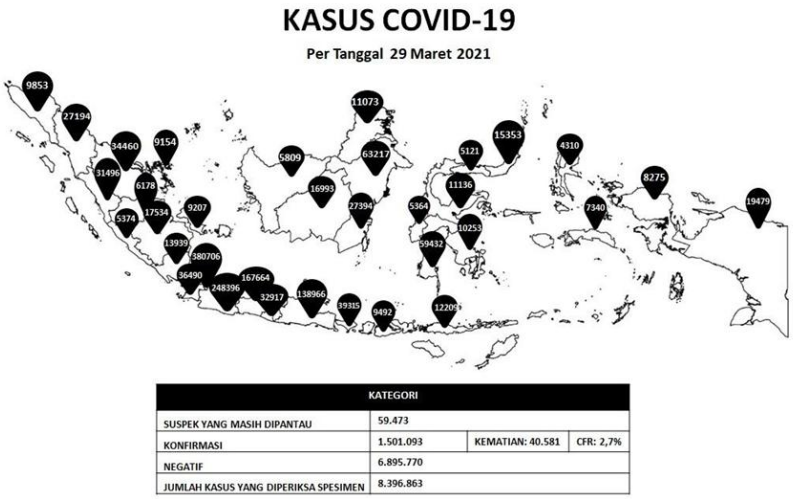
Abstract
This study examines how the Safety Management System (SMS) at Halim Perdana Kusuma Airport was used during the COVID-19 pandemic. It did this by reading journals, news, and data from the Statistics Center. The results of the study showed that the following things supported the use of SMS and personnel responses on how effectively it was used in the airport environment during the pandemic: PT. Angkasa Pura II and the Director General of Air Transportation collaborated on a number of work programs that resulted in the successful establishment of vaccination centers and checkpoints, the procurement of personal protective equipment (PPE), the acquisition of the PeduliLindungi application, and the prevention and slowing down of the virus's spread.
Keywords: Safety Management System, Literature Study, Airport, implementation, COVID-19

INTRODUCTION

In late December 2019, Wuhan City, China, was the first location to be reported infected with COVID-19. The virus has rapidly spread to nations all over the world since it first appeared. Among the nations where instances rose in the first few months of 2020 was Indonesia. Depending on the severity of the virus, COVID-19 might present with a variety of symptoms. The signs of a COVID-19 infection include fever, coughing, and dyspnea. On the other hand, symptoms at the critical level include shortness of breath or difficulty breathing, headache, chest discomfort or illness, or blueness in the torso, lips, or limbs. (Putri, 2021). The COVID-19 epidemic has affected nearly every country in the world(Indupurnahayu, 2021). People are still worried about the pandemic's long-term effects on the economy and health, despite the fact that it has been around for two years.(Keke et al., 2021) Experts and the public continue to work to stop the coronavirus from spreading globally(Muselli et al., 2021). The Indonesian government uses a special website to convey official information about the pandemic situation. The website displays the latest data on the number of cases, cure rates, and health policies that have been implemented. Public awareness of the importance of maintaining health, implementing health protocols, and getting vaccinated continues to increase amid ongoing changes. It is crucial to control the impact of this pandemic on daily life. The following data is displayed on the government's official COVID-19 website:



KATEGORI			
SUSPEK YANG MASIH DIPANTAU	59.473		
KONFIRMASI	1.501.093	KEMATIAN: 40.581	CFR: 2,7%
NEGATIF	6.895.770		
JUMLAH KASUS YANG DIPERIKSA SPESIMEN	8.396.863		

Figure 1. Data on COVID-19 Cases in Indonesia

The Case Fatality Rate (CFR) in Indonesia was recorded at 2.7%, which is low compared to the total number of confirmed cases of 1,501,093. This is the data currently available. The COVID-19 pandemic has had a huge impact and affected various aspects of people's lives, despite the very small number of reported deaths. Operational safety in the aviation industry is increasingly important due to the impact of the COVID-19 pandemic. SMS helps airlines and airports address their concerns by implementing risk mitigation strategies to ensure safe operations. Due to lockdown policies and travel restrictions in many countries, many airlines have experienced a significant drop in passengers since the beginning of the pandemic. SMS enables the evaluation of flight safety procedures, such as stricter aircraft inspections, flight schedule adjustments based on safety factors, and improved flight crew training to handle emergency situations due to the pandemic. In addition, the airport underwent major operational changes. With mobility restrictions and strict health protocols, the number of passengers on board and aircraft was reduced. In this situation, SMS is responsible for ensuring that any operational adjustments relating to safety are made with top priority. This includes implementing the best sanitization protocols, limiting the number of passengers to safe capacity, and creating contingency plans in anticipation of an increase in COVID-19 cases at the airport. With the integration of SMS in airport and flight management, the aviation industry can operate with a maintained level of safety despite facing a global crisis such as a pandemic.

One of the state-owned companies under the Ministry of Transportation that manages airport services and all services associated with airports in western Indonesia is PT Angkasa Pura II (Persero)(Puspa Wildyaksanjani, J., 2018). One of the businesses that saw a decline in sales as a result of the COVID-19 outbreak was PT Angkasa Pura II(BPS, n.d.) According to a summary of passenger data from Halim Perdana Kusuma Airport during the pandemic released by Badan Pusat Statistika (BPS) in early 2024, the aviation sector saw a sharp drop in operations but continued to function correctly and ensure flight safety. The Ministry of Transportation's Directorate of Civil Aviation(RI, 2021) additionally released a policy to address COVID-19 at airports in Indonesia (Palembang, 2022). Health protocols are still being introduced and monitored in compliance with World Health Organization (WHO) regulations. Nevertheless, these regulations were eventually modified by the Task Force for the Acceleration of Disaster Management to accommodate the circumstances in Indonesia(Murni et al., 2021). Badan Pusat Statistika (BPS) has collected the following recent data:

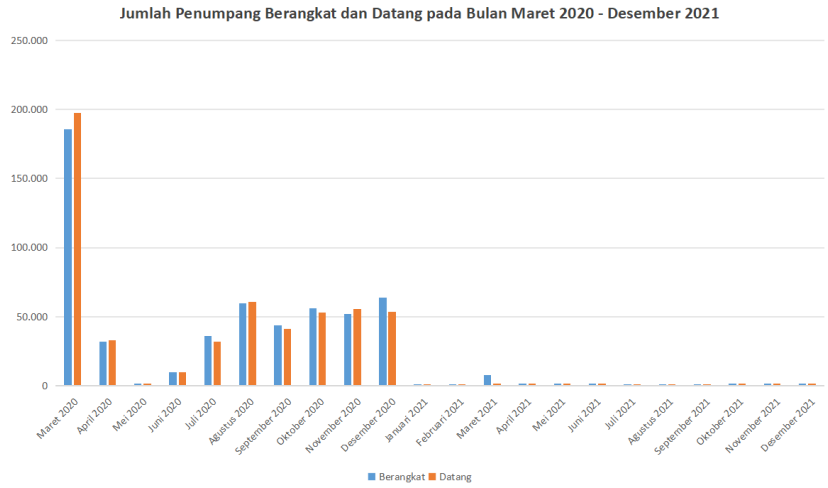


Figure 2. Number of Aircraft Passengers at Halim Perdana Kusuma Airport from March 2020 - December 2021

Figure 2 shows that the Government Regulation (PP) on Large-Scale Social Restrictions (PSBB) issued by President Jokowi significantly reduced passenger numbers in April 2020. The number was close to 200,000 in March. But the following month saw a significant decline.

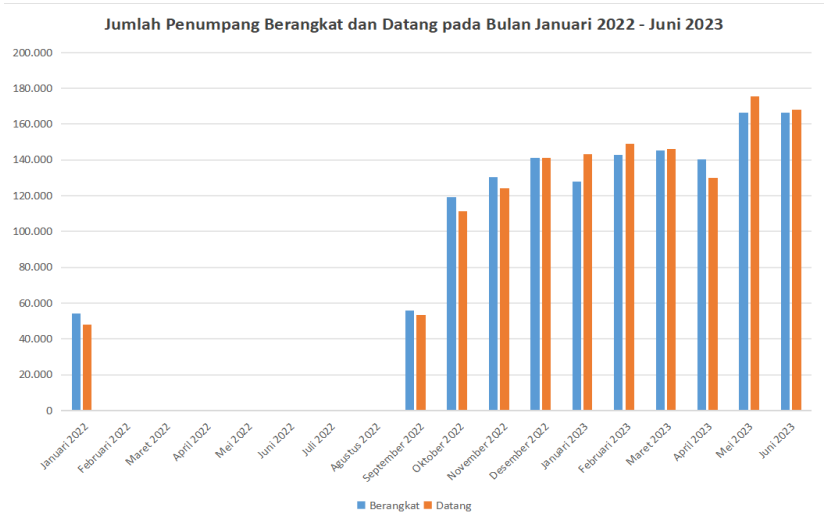


Figure 2. Number of Aircraft Passengers at Halim Perdana Kusuma Airport from January 2022 - June 2023

According to Presidential Regulation Number 9 of 2022, Halim Perdana Kusuma airport will be closed for revitalization from February 26, 2022, to September 1, 2022. Soekarno-Hatta International Airport is the new location for all flight operations. According to certain 2020 International Air Transport Association (IATA) figures, the damage is expected to exceed 84 billion USD(Choi, 2021). The Safety Management System (SMS) consists of an organizational structure, implemented responsibilities, policies, and procedures.

PURPOSE OF THE RESEARCH

This study investigates how the Safety Management System (SMS) at Halim Perdana Kusuma Airport is being used during the COVID-19 pandemic. This research mainly focuses on how the four pillars of the SMS, namely safety policies and objectives, safety risk management, safety assurance, and safety promotion are utilized in the context of the current global health crisis. In addition, the aim of this research is to discover the various operational issues airports

are facing during the pandemic and how the Safety Management System (SMS) can address these. This research is expected to provide strategic advice on how to strengthen aviation safety systems, particularly in emergency situations such as a pandemic.

THEORITICAL BACKGROUND

Safety Management System (SMS) is a systematic approach to managing aviation safety, which includes the organizational structure, accountabilities, policies and procedures needed to ensure effective risk management. The aim of this system is to create a proactive and sustainable safety culture, and ensure that operations in the aviation sector can take place safely even in emergency conditions such as the COVID-19 pandemic. The Safety Management System (SMS) is centered on a methodical approach to risk identification and management with the goal of minimizing fatalities, property damage, and flight permit revocation, streamlining financial expenditures, and lowering the frequency of negative social and environmental effects.(Sisilia, 2009) An essential instrument for estimating the cost of putting safety measures in place is the Safety Management System (SMS). (Ntampakis, D & Biermann, 2014). A proactive approach to safety management that prioritizes process control over inspection and remedial action on the end product is known as a Safety Management System (SMS) (Ludwig et al., 2007)

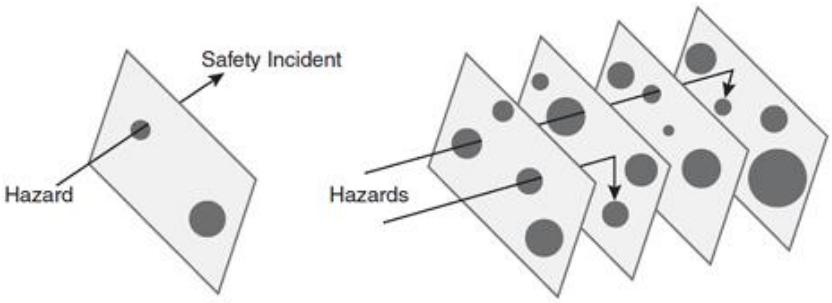


Figure 4. Safety Management System Layers

Safety Management System (SMS) consists of four main pillars, according to Annex 19 of the International Civil Aviation Organization (ICAO):

1. Safety Policy and Objectives. This pillar shows how important the organization is to safety. The creation of a clear safety policy, the setting of measurable and achievable safety objectives, and the proper division of responsibilities and authorities within the organizational structure are some examples in airport operations. Upper management should actively support the development and maintenance of safety systems, including providing adequate resources for the implementation of such policies. The incorporation of safety into all aspects of operational decision-making demonstrates this commitment.
2. Safety Risk Management. This pillar covers the procedures for identifying hazards, evaluating risks, and putting suitable mitigation measures in place(Roelen, 2012) defines safety as freedom from unacceptable risk, risk is a combination of the likelihood of harm and the severity of the harm. During the COVID-19 pandemic, technical aviation factors and public health factors are different sources of safety threats. One of them is the possibility of the virus spreading in the airport environment. The extent of risk control is determined by the ability to foresee risk factors and adapt to shifts in demand. The extent to which an airport can minimize costs and preserve liquidity determines how it will react(Pahala, 2014). Therefore, safety risk management must be expanded to include new situations such as passenger capacity restrictions, sanitization procedures, and treatment of passengers

affected by infectious diseases. This process must be ever-changing and adaptable to changes in the operating environment. Safety risk management is one of the essential components of a safety management system. Participants are expected to prioritize risks based on severity, manage risks, discover potential risks with minimal effort, perform record keeping and auditing, and think about the consequences.

3. Safety Assurance. Safety assurance is a process of evaluating and monitoring the performance of safety systems. Internal audits, safety reporting (safety reports), incident investigations and trend analysis of safety data are ways to achieve this. During a pandemic, these procedures are essential to ensure that risk reduction measures are actually working. Observations help to continuously evaluate the safety system and, if required, make modifications or additions. Therefore, the comfort of potential travelers with the assurance of safety and security while at Halim Perdana Kusuma airport, as well as the facilities there, determine the degree of satisfaction of airline passengers. (Muhammad Ikhsan, 2024)
4. Safety Promotion. A strong safety culture ensures that all employees, both management and operational staff, understand the importance of safety and actively participate in maintaining a high level of safety. Health protocol training, intensive communication on policy changes, and safety campaigns are ways to raise everyone's awareness of new risks that arise during a pandemic. In order for all policies and procedures to be applied consistently in the field, effective communication is essential.

These four pillars are the basic framework used to manage safety in the aviation industry as a whole. A good Safety Management System (SMS) implementation not only improves operational safety, but also builds public trust in air transportation services, especially during times of global crisis such as the COVID-19 pandemic.

RESEARCH METHODS

This research uses a literature study method from journals, news, and data from the Badan Pusat Statistika (BPS). A literature study is a sort of research in which researchers gather different books and magazines that are relevant to the topic and goal of their investigation.(Danial, Endang. & Nanan, 2009) Supporting and improving knowledge of the research topic is the aim of the literature review(Pusparinda, Laela. & Santoso, R., I., 2016). More thorough literature research on the topic under study will be carried out by researchers. (Kartiningrum, Eka, 2015)

RESEARCH RESULTS AND DISCUSSION

Procurement of Personal Protective Equipment (PPE)

During the COVID-19 pandemic, the government issued various regulations that affected airport operations. These regulations include the management of Halim Perdanakusuma Airport and the implementation of security protocols. One of the important decisions made by the Director General of Civil Aviation in 2022, Number KP 1230, stipulates that PT Angkasa Pura II will continue to manage Halim Airport. This is in contrast to the previous letter which stated that PT Angkasa Pura II should abandon the 21 hectares of land at Halim Perdana Kusuma Airfield. In addition, PT Angkasa Pura II is responsible for supervising and recording the Personal Protective Equipment (PPE) needs of employees working in various branch offices to be reported regularly to the Head Office. The Directorate General of Civil Aviation issued a circular to establish security protocols during the pandemic to implement the law. This process covers the needs of individuals organizing security protocols during the pandemic. Requirements for security personnel to use PPE and latex gloves are included in this procedure.

This regulation demonstrates the government's policy to ensure the safety, operations, and management authority of the airport in the context of the pandemic and changes in land administration at Halim Perdanakusuma Airport.

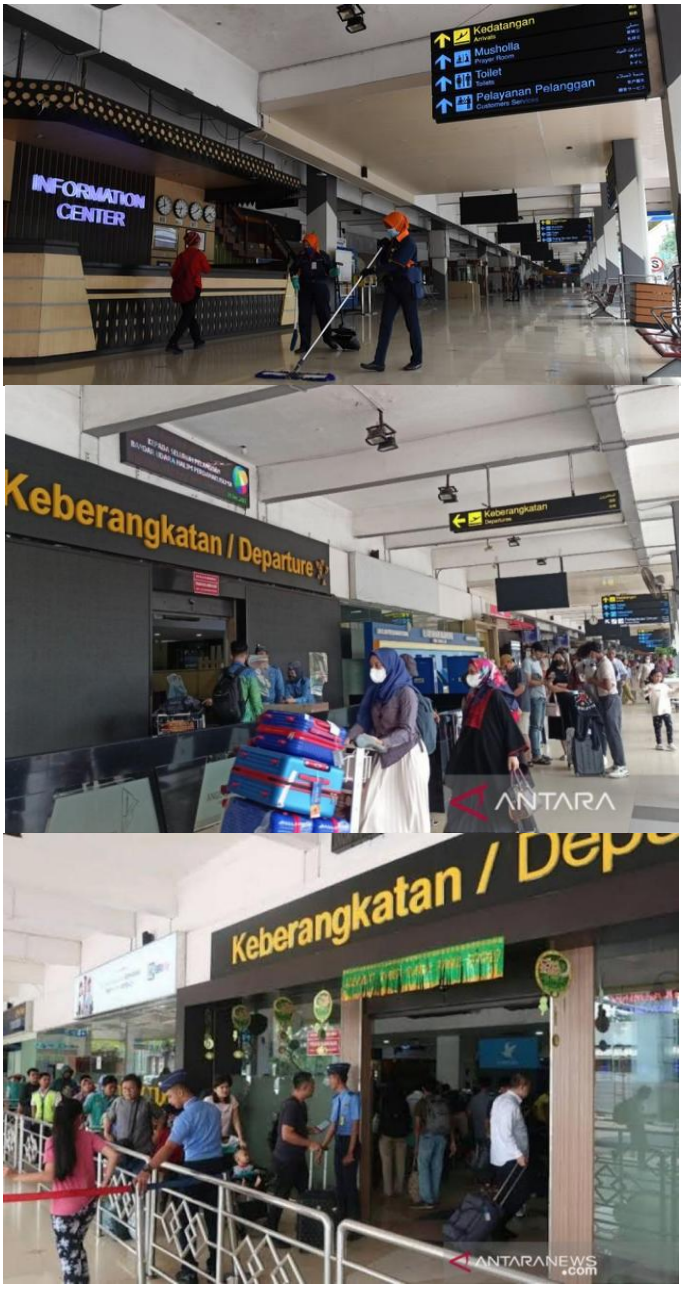


Figure 5-7. Airport officers and passengers wearing masks

By providing a safe and comfortable working environment for all employees, PT Angkasa Pura II is strongly committed to supporting government policies related to the prevention of the COVID-19 pandemic. In addition, they are committed to ensuring that airports continue to operate in accordance with applicable health standards. To do this, the company has issued a board of directors regulation to protect employees at branch offices and airport operational units. One of the main steps taken is to provide Personal Protective Equipment (PPE) facilities placed in the check-in and arrival areas. The presence of PPE in this strategic location aims to prepare security personnel for emergency situations, especially if a passenger is found who is confirmed positive for COVID-19 and requires fast and controlled handling actions to prevent

the spread of the virus. To ensure the effectiveness of PPE use, PT Angkasa Pura II has established a supervision system carried out by the Safety Risk and Quality Control unit, which is responsible for the maintenance and distribution of safety equipment according to operational needs.

The personal protective equipment (PPE) stockpile has a range of general safety equipment to provide the best protection for employees in the workplace. These include protective shoes, hazmat suits, safety gloves, masks, and face shields. PT Angkasa Pura II also sets PPE standards to ensure its employees are safe at work in various conditions. For example, face shields must be made of food grade PET material with a thickness of 0.1-0.3 mm, which protects the face up to the chin. To maximize protection, visors should be equipped with double shields, especially in high-risk environments or when officers are in direct contact with passengers. Therefore, to prevent exposure to potentially infectious fluids, gloves should use nitrile (non-latex) material, free of powder, and be standard blue in color. The durability standards include tear resistance, leak resistance, and biocompatibility, so that they do not cause allergic reactions and remain comfortable to use for long work durations.

Figure 8-9. Example of face shield and 3 ply mask

In addition to face shields and gloves, 3 ply surgical masks are a mandatory element in the health protocol implemented in the PT Angkasa Pura II work environment. These masks are made from non-woven and seamless materials, and have a loose shape to stay comfortable but still fully protect employees while they work. The product must meet high quality standards, such as bacterial filtration efficiency of at least 98%, differential pressure of less than 5.0 mmH_2O/cm^2, and the ability to filter fine particles of 0.1 microns with an efficiency rate of at least 98%. To provide additional protection, the mask is made with a class 1 flame spread classification and is able to withstand the penetration of synthetic blood with a pressure of at least 160 mmHg. These specifications are designed to ensure a high level of safety for personnel working in areas with high potential risk. With number ND.9977/DSM/00/10/2020, the VP Corporate Safety Management PST of PT Angkasa Pura II has issued a Memorandum of Office that formally explains all the technical requirements and safety standards. This document is used as the main guideline in the procurement and distribution process of Personal Protective Equipment (PPE) in all company work units. The implementation of these provisions reflects PT Angkasa Pura II's commitment to ensuring the safety of personnel and supporting the consistent implementation of health protocols in the airport environment, so that operations continue to run orderly without neglecting the aspects of protection.

PeduliLindungi Application

The Indonesian government through a collaboration between the Ministry of Health (Kemenkes) and Telkom Indonesia created an application in response to the COVID-19

pandemic that began to spread in 2020. During the COVID-19 pandemic, this application was used to manage the Safety Management System (SMS) as a means of controlling the COVID-19 pandemic and passenger safety. Halim Perdana Kusuma Airport has implemented this application as part of the flight safety protocol. The existence of the PeduliLindungi application must be able to create convenience for people who will access public facilities, because when people have difficulty in accessing or even not having access to the PeduliLindungi application, then these citizens do not have access to be able to utilize public facilities. Therefore, the PeduliLindungi app shouldn't be a barrier to accessing public facilities for those who are proven to be healthy and have not been exposed to COVID-19 (Dian Herdiana, 2021) Initially, the app uses the concept of digital tracing, which allows users to find out the level of environmental risk based on travel history and interactions with individuals confirmed positive for COVID-19. Over time, PeduliLindungi expanded its functions to support the health document validation system, including vaccination certificates and COVID-19 test results. The government then required the use of this application as a condition for access to public spaces, public transportation, and air and land travel.

The PeduliLindungi app acts as a digital health monitoring system originally designed to support the handling of the COVID-19 pandemic. With features such as health document verification, contact tracing, and e-HAC, the app is a tool for the public to ensure compliance with health protocols before entering public spaces or traveling. In addition to being a condition of access to public places and modes of transportation, the app also serves as a health database that assists authorities in analyzing virus spread patterns and taking more structured preventive actions. However, when viewed more broadly, the concepts applied in PeduliLindungi are closely related to the principles in the Safety Management System (SMS). In a Safety Management System, a data-driven approach and risk monitoring are key elements to prevent incidents and ensure safety. PeduliLindungi, with its ability to track user interactions and verify health conditions, essentially reflects a risk mitigation system that is in line with the operational safety philosophy. Just like how airports implement a Safety Management System to manage potential hazards and improve flight safety, this application serves as an instrument to control public health risks with real-time information-based methods.

If concepts like this continue to be developed, it is not impossible that technology-based approaches like PeduliLindungi can become part of a broader safety system, whether in transportation, industry, or health. The application of data-driven decision making principles allows authorities to design more effective policies, identify potential threats earlier, and improve efficiency in response to emergency situations or conditions that require special attention. As part of efforts to control the COVID-19 pandemic, Angkasa Pura II has integrated the use of the PeduliLindungi application at various airports they operate, including Halim Perdanakusuma Airport. This implementation aims to improve security and efficiency in the process of validating passenger health documents, as well as minimizing the risk of disease spread in the airport environment. In order to support the operationalization of the application, Angkasa Pura II provides guidance for airport administrators and officers, which includes procedures for checking vaccination status and COVID-19 test results through QR Code scanning. This mechanism allows officers to systematically screen potential passengers before they are allowed to enter the departure area. With this system in place, the airport can ensure that individuals traveling have met the health requirements set by the government.

Figure 10. Airport officer screening passengers

In practical terms, the PeduliLindungi application collects data that has been entered by the COVID-19 Handling Task Force and related agencies from various regions in Indonesia. This results in a nationally integrated information system. Those who frequently use public areas or facilities are the target audience for this application. (RI, 2021). PeduliLindungi functions as an access limitation system in practice, allowing entry to specific public locations only to those who have gotten the first or second dose of vaccine. (R.Aditya, 2021)

Vaccination Centers and Checkpoints

Since the outbreak of the COVID-19 pandemic in early 2020, various sectors, including the world of aviation, have been faced with the need to adapt quickly to changing dynamics. as the operator of PT Angkasa Pura II a number of national airports such as Halim Perdanakusuma Airport, responds to these conditions by developing operational strategies to maintain the continuity of safe and efficient flight services. Through the application of the principles of resilient, agile, and lean operation, Angkasa Pura II is able to adjust flexibly to evolving policies, while still upholding safety standards and service quality at all airports under its auspices. In an effort to implement agility operations, Angkasa Pura II regularly adjusts Standard Operating Procedures (SOPs) based on developments in public health and mobility policies. This policy allows airports such as Halim Perdanakusuma to adjust operational steps quickly, especially in the aspect of checking passenger health before departure. On the other hand, the application of lean operations ensures that policy implementation is carried out efficiently and on target, with procedures that are easily understood and implemented by airport staff. In addition, a tamper-resistant approach to operations helps airport infrastructure and resources become more resilient to operating in challenging conditions. Halim Perdanakusuma Airport and other airports under the management of Angkasa Pura II have complied with the regulations stipulated in the COVID-19 Handling Task Force Circular Number 14 concerning Domestic Travelers during the Java-Bali Emergency PPKM period. According to this regulation, everyone traveling to or from the Java and Bali regions must carry a vaccination certificate - at least the first dose - as well as PCR test results from samples taken no more than two days before departure. To ensure compliance with the regulation, the airport established a health document validation mechanism through two main checkpoints, where checks are carried out from the initial screening stage to the final validation stage by health officers.

Figure 11. Military Officers Guard The Airport Checkpoint

Figure 12. Vaccination Center at Halim Perdana Kusuma Airport

In addition to conducting stricter health checks, Angkasa Pura II is also working with the Ministry of Health's Port Health Office (KKP) to provide vaccinations to several important airports, including Soekarno-Hatta Airport as the main center. The purpose of the vaccination center is to support the national vaccination program and help passengers meet travel requirements. Angkasa Pura II Airport provides various inspection methods to improve faster and more accurate detection of COVID-19. One of these methods is Reverse Transcriptase Polymerase Chain Reaction (rRT-PCR). This method works by identifying the genetic material of the SARS-CoV-2 virus in patient samples. usually through nasopharyngeal swabs. The rRT-PCR technology has high sensitivity and has become the gold standard in COVID-19 diagnosis due to its ability to detect traces of viral RNA with precision. In addition to rRT-PCR, there is also the Rapid Molecular Test-RT PCR method, which is a form of PCR-based testing with faster results than conventional PCR techniques. This method utilizes nucleic acid amplification technology that enables virus identification in a shorter time, often within hours. Meanwhile, the Isothermal Rapid Molecular Test-NEAR works with an isothermal amplification approach, which differs from PCR in that it does not require repeated heating and cooling cycles to amplify genetic material. NEAR technology enables virus detection with results obtainable in less than an hour, making it particularly effective for passengers who need quick validation before departure. With these various screening methods in place, airports such as Halim Perdanakusuma can ensure that the health control system continues to run optimally, enabling early detection for at-risk individuals, and directly supporting the continuation of safe air travel in the midst of a pandemic situation. At Halim Perdanakusuma Airport, the implementation of health protocols includes restrictions on the capacity of public services, including rules prohibiting on-site dining at restaurants located within the airport area. In addition, public

transportation modes operating at the airport must comply with a maximum capacity of 70 percent according to Emergency PPKM regulations. These measures are intended to support government safety policies and reduce the risk of spreading COVID-19 in the airport environment. With a series of adaptive and data-driven strategies, Angkasa Pura II airports, including Halim Perdanakusuma, are able to maintain their operations safely and ensure that air travel continues in accordance with applicable health protocols.

CONCLUSION

During the COVID-19 pandemic, Halim Perdanakusuma Airport has implemented a robust Safety Management System (SMS) to ensure operations continue to run safely and efficiently. PT Angkasa Pura II, responsible for the airport, is committed to implementing strict health protocols, while coordinating with various parties to support efforts to prevent the spread of the virus. The readiness of operational facilities, both on the air and land side, is a major factor in the successful implementation of SMS during the pandemic. Anticipatory measures taken include drafting new policies, adjusting airport operations, and providing facilities that support the safety and health of passengers and airport staff. As part of the adaptation to pandemic conditions, the airport is implementing various policies to get used to the new normal, including setting physical distancing, providing hand washing facilities and hand sanitizers, and checking body temperature for everyone in the airport environment. The use of technology is also further optimized with an online-based safety reporting system, which allows operational supervision to continue without reducing flight safety standards. In addition, Halim Perdanakusuma Airport collaborates with the Ministry of Transportation and the COVID-19 Task Force to ensure that every passenger and airport employee complies with applicable health regulations.

To limit potential crowds, the airport adjusted its operating hours, ensuring that passenger movements remained under control without disrupting the smooth flow of flight schedules. In addition, the PeduliLindungi app assists passengers in checking health documents, while Personal Protective Equipment (PPE) for airport employees continues to be provided to increase protection against the risk of virus exposure. Educational campaigns on aviation safety and health are also intensified to reassure the public that air travel remains safe during the pandemic. Although various mitigation measures have been implemented, several obstacles are still faced in the implementation of Safety Management System (SMS) at Halim Perdanakusuma Airport. One of the main challenges is the limited number of personnel due to restrictions on operating hours, which reduces flexibility in managing services at the airport. In addition, the organizational structure, which is still in the development stage compared to other airports, is an obstacle in coordinating and implementing more complex procedures. The presence of external factors, such as foreign objects around the airport including kites that can interfere with air traffic, is also a challenge in maintaining flight safety. PT Angkasa Pura II continues to strive to optimize airport operations while maintaining cost efficiency and maintaining facilities that support flight safety. Although there are adjustments in the scale of operations due to the pandemic, key facilities related to safety and health remain a priority. Socialization of flight safety and compliance with health protocols continues to be carried out, both to service users and the wider community. With the various steps that have been taken, Halim Perdanakusuma Airport continues to adapt to the pandemic situation, ensuring that safety and comfort standards are maintained in accordance with national policies.

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