ANALYSIS OF THE EXISTENCE OF INSPECTION ROADS TO ENSURE FLIGHT SAFETY AND SECURITY AT THE BLU OFFICE OF THE MAIN CLASS 1 UPBU JUWATA TARAKAN

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ABSTRACT

This research analyzes the existence and effectiveness of the inspection road in ensuring flight safety and security at Juwata Tarakan Airport. The background to the problem is the inadequate inspection road infrastructure, especially at the end of runway 06 which is still a swamp, thereby hindering perimeter fence patrols and emergency response. The objective of this study is to evaluate the physical condition, supporting facilities, and the role of the inspection road in airport security operations.

The method used is a qualitative approach with an interview technique involving three Aviation Security (Avsec) personnel who work at Juwata Tarakan Airport. The results show that the existing inspection roads do not meet the standards, and supporting facilities such as CCTV and lighting are not complete. Nevertheless, the inspection road is considered very important and effective for perimeter patrols and for accelerating emergency responses, especially in areas that are difficult to reach.

Based on the findings, it can be concluded that although the current inspection road supports work at several points, it is still not optimal overall. The suggestions put forward are to immediately realize the comprehensive construction of the inspection road, especially in the runway 06 area, improve supporting infrastructure and facilities, and carry out periodic maintenance to ensure sustainable flight safety.

Keywords: *Analysis, Inspection Road, Safety, Security, Juwata Tarakan Airport*

1. INTRODUCTION

Juwata Tarakan Airport, managed by the Public Service Agency (BLU) of the Class I Main Airport Authority (UPBU), is located in Tarakan City, North Kalimantan, approximately 3.5 kilometers west of the city center. Initially constructed as a military airbase, the airport has evolved over time into a civil aviation facility, undergoing modernization in parallel with the steady increase in passenger volume. In recent years, Juwata Tarakan Airport has implemented various infrastructure upgrades aimed at enhancing passenger comfort and aviation security. The airport features a 2,250-meter-long and 45-meter-wide runway capable of accommodating narrow-body aircraft such as the Boeing 737 and Airbus A320. Currently, it serves multiple airlines, including Batik Air, Lion Air, Super Air Jet, Citilink, Aman Air, MAF Indonesia, Smart Aviation, Susi Air, and Express Cargo Airlines.

Airside operations at Juwata Tarakan Airport encompass a wide range of activities, including air traffic control, aircraft refueling, the movement of Ground Support Equipment (GSE), and security patrols conducted by Aviation Security (AVSEC) personnel. AVSEC plays a critical role in maintaining operational safety and security by conducting regular patrols and comprehensive inspections to ensure the integrity of restricted areas. This includes monitoring the airport perimeter fence, detecting potential threats, and preventing any unauthorized access to secure zones.

One key infrastructure element that supports AVSEC patrols and perimeter inspections is the inspection road, which serves as a dedicated access route for security officers to conduct patrols, inspections, and rapid responses in case of perimeter breaches or operational disruptions. As described by Chaksono, Soebagio, and Rosmayanti (2025) [1], an inspection road is typically positioned along the runway, taxiway, apron,

and airport perimeter to enable routine monitoring of runway conditions, perimeter fencing, and other operational facilities. Its presence ensures the safety, efficiency, and timeliness of airside operations, as well as facilitates risk mitigation procedures, prevents potential security incidents, and accelerates emergency responses.

In accordance with the Indonesian Minister of Transportation Regulation PM 167 of 2015 on access control to restricted security areas in airports, the availability of an inspection road is mandatory, as stated in Article 4, paragraph (1) point (f) and paragraph (2) point (g) [2], which require that airports provide inspection roads for patrol purposes. However, at present, Juwata Tarakan Airport lacks a fully compliant inspection road. The existing inspection routes do not fully encircle Runway 06 and Runway 24, resulting in operational limitations. This incomplete infrastructure compels security and operational personnel to rely heavily on Air Traffic Control (ATC) clearance for airside movements, which can delay routine patrols, perimeter inspections, and emergency responses.

Currently, AVSEC patrols of the perimeter fence begin at the taxiway Alpha area and proceed to the end of Runway 06, while inspections along Runway 24 are conducted via limited inspection roads near taxiway Charlie. Inspections along Runway 06 often require vehicles to travel directly on the active runway, increasing operational risks and necessitating careful scheduling around flight operations. Additionally, the existing unpaved and semi-permanent sections of the inspection road are susceptible to flooding, uneven surfaces, and slipperiness during rain, further impeding patrol efficiency and safety.

A comparison between Juwata Tarakan Airport and Soekarno–Hatta International Airport highlights the gap in infrastructure readiness. At Soekarno–Hatta, inspection roads are fully paved, continuous, and integrated with airport security systems, enabling uninterrupted perimeter patrols and quick emergency access. In contrast, Juwata Tarakan's limited and fragmented inspection roads only provide localized access, restricting comprehensive monitoring of the airside perimeter.

Field observations reveal that, in the absence of a fully developed inspection road, AVSEC officers at Juwata Tarakan often have to cross active runways to reach certain perimeter sections. This practice, documented in on-site case studies, poses safety hazards, disrupts flight operations, and prolongs inspection response times. Such conditions are inconsistent with regulatory standards and undermine the ability of AVSEC to maintain optimal perimeter security.

Given these conditions, this study focuses on analyzing the existence and adequacy of the inspection road at Juwata Tarakan Airport in ensuring aviation safety and security. The objectives of this research are to examine the current inspection and monitoring practices conducted by AVSEC in areas where the inspection road does not meet regulatory standards, and to identify the operational challenges encountered during perimeter surveillance. The findings are expected to provide actionable recommendations for improving inspection road infrastructure, thereby enhancing airside operational safety, supporting AVSEC patrol efficiency, and complying with both national and international aviation security requirements.

2. METHOD

2.1 Research Method

Research methods are an important part of the scientific process for obtaining data that is purposeful and has specific uses. According to (Dawis et al., 2023), methodology is a broad framework that encompasses the entire research process, including the social-organizational context, philosophical assumptions, ethical principles, and the impact of the new knowledge generated. Meanwhile, methods refer to the specific techniques used in research, such as selecting samples, observing social life, collecting and analyzing data, and reporting research results. In other words, methodology does not only discuss data collection techniques but also encompasses the logical and philosophical foundations underlying the choice of those methods. Therefore, research methods can be understood as a structured and systematic scientific approach used to obtain valid data that is relevant to specific research objectives.

2.2 Research Design

[3] This study uses a qualitative descriptive research method, consisting of two descriptive and qualitative terms. According to Rukajat (2018), descriptive research is research that seeks to describe phenomena that occur in reality and in the present, as this research consists of making systematic, factual, and accurate descriptions, drawings, or paintings of the facts, characteristics, and relationships between the phenomena being studied. Meanwhile, according to Abdussamad (2023), qualitative research is a research method used to study predetermined conditions, where the researcher is the key instrument, data collection techniques are conducted in a structured manner, data analysis is inductive, and qualitative research results emphasize meaning rather than generalization. From the two definitions above, the definition of qualitative descriptive method is a data analysis method to reveal, understand, and interpret a phenomenon occurring in the research subject by describing data and facts in words and language comprehensively.

Research design itself is a systematic and objective plan for data collection, processing, analysis, and presentation aimed at solving a problem or testing a hypothesis. Therefore, a study was conducted on the Analysis of the Presence of Inspection Roads to Ensure Aviation Safety and Security at Juwata Tarakan Airport. In qualitative descriptive research, the research design determines the research steps to optimize the description of phenomena in the field.

2.3 Research Subject

2.3.1. Population

According to Eddy Roflin (2021), population refers to the total possible values, calculated quantitatively or qualitatively, of a particular characteristic of a clearly defined group whose properties are to be studied. Meanwhile, [4] according to Sugiyono (2019), population refers to a generalization area consisting of subjects and objects with certain characteristics that are studied to obtain a conclusion. [5] Population also has another meaning, namely the entirety of research objects. If a researcher studies all elements in a study, then that study is part of population research (Suharsimmi, 2019). Therefore, based on this description, population is not just people but can also be natural objects. The population is also not just the number of objects or subjects being studied, but includes all the characteristics of the objects and subjects being studied so that these characteristics can be researched. In this study, the author took a population of 3 people consisting of the Head of the Avsec Unit and 2 Avsec personnel.

2.3.2. Sample

According to (Susanto et al., 2024), a sample is a part of a population selected for observation or research purposes. The use of samples allows researchers to generalize research results more efficiently and save costs compared to researching the entire population [6]. However, sample selection must be done carefully so that the research results can represent the actual conditions of the entire population. If the sample used does not accurately represent the population, the research results may be inaccurate. The selection of the sampling method is adjusted to the characteristics of the population, the research objectives, and the availability of resources.

In this study, the author took samples from three informants, namely the Head of the Avsec Unit and two of his members, considering the knowledge possessed by the respondents.

2.3.3. Object

[7] The research object is defined as a characteristic, value of an activity, or object that has certain variations that have been determined for study and from which conclusions can be drawn (Sugiyono, 2017).

In this study, the researcher took the research object, namely the existence of an inspection road at Juwata Tarakan Class 1 Main Airport.

2.4 Data Collection Techniques

In qualitative research, data collection typically involves multiple techniques such as interviews, observation, and documentation. This multi-method approach enables researchers to develop a comprehensive understanding of the phenomenon under investigation, examine respondents' statements in depth, provide detailed descriptions from their perspectives, and study the phenomenon in its natural setting (Ischak et al., 2019). In this study, the researcher employed three primary qualitative data collection techniques—observation, interviews, and literature review—each selected to ensure the accuracy, validity, and completeness of the findings.

Observation was conducted to obtain direct and real-time data from the research site. According to Sugiyono (2018), observation is a distinctive data collection technique that is not limited to people but may also involve other objects. Similarly, Tersiana (2022) defines observation as a thorough and attentive process of monitoring behavior in a given context, with the primary aim of describing individual activities and interpreting the meaning of events from the individuals' perspectives. Herdiansyah (2019) further notes that observation involves systematic monitoring and sensory examination to gather research data. In this study, the researcher adopted a passive participant observation approach, whereby the researcher observed activities in the field without directly engaging in them (Nasution, 2023). This method allowed the researcher to capture the situation from a third-person perspective, documenting and analyzing events without influencing them (Fiantika et al., 2022). The observation took place at Juwata Tarakan Airport from January to February 2025, focusing on the existence and condition of the inspection road as a critical element in ensuring aviation safety and security. [8] Guided by the International Civil Aviation Organization (ICAO) Document 9157 – Aerodrome Design Manual Volume 1, Annex 14, and Civil Aviation Safety Regulation (CASR) Part 139 [9] on aerodrome operations, the key indicators observed included: the existence of an inspection road, surface integrity, accessibility to all perimeter areas, operational vehicle access, frequency of AVSEC patrols, adequacy of lighting for night patrols, and the effectiveness of the inspection road in detecting hazards such as foreign object debris (FOD), wildlife intrusions, and perimeter fence damage.

Interviews were also employed to gain deeper insights from key informants. Sugiyono (2019) defines interviews as a purposeful exchange of information and ideas through questions and answers, allowing the researcher to construct meaning on a given topic and obtain information that might not be accessible through observation alone. In this study, in-depth interviews were conducted using a source triangulation technique, in which multiple informants from different roles or backgrounds were interviewed about the same topic. This approach enables cross-verification of information to ensure its validity by comparing and analyzing responses from different perspectives (Zuchri Abdussamad, 2021). The informants included the supervisor of the researcher, who also served as the head of the Aviation Security Unit, and two AVSEC personnel. The interview questions were guided by Minister of Transportation Regulation PM 167 of 2015 on access control to restricted areas in airports, as well as the Standard Operating Procedures (SOPs) of AVSEC at Juwata Tarakan Airport. The scope of questions covered inspection road conditions,

compliance with standards, accessibility, usage frequency, supporting facilities, maintenance, FOD and perimeter breach incidents, emergency response times, patrol effectiveness, SOP adherence, and personnel satisfaction.

In addition to observation and interviews, a literature review was conducted to gather and synthesize relevant theoretical and empirical information. As noted by Cahyo (2020), literature review involves collecting, reading, recording, and processing information from various written sources such as books, journals, reports, and other relevant publications. In this study, the literature review was used to obtain background knowledge and regulatory references concerning inspection roads, including their design, operational standards, and role in enhancing airside safety and security. This secondary data served as a basis for comparing theoretical expectations with actual field conditions and for strengthening the analytical framework of the study.

Through the combination of these three techniques—observation, interviews, and literature review—the study applied methodological triangulation to ensure the credibility, depth, and reliability of the collected data, thereby providing a robust foundation for the subsequent analysis and discussion.

2.5 Data Analysis Technique

Data analysis is a systematic process of organizing, processing, and interpreting data obtained from interviews, field notes, and documentation. In qualitative research, this process involves categorizing, structuring, simplifying, and drawing conclusions from the collected data to make it understandable for both the researcher and other stakeholders. According to Sugiyono (2019), data analysis in qualitative research begins as early as the problem formulation stage, continues throughout data collection in the field, and extends until the preparation of the final research report.

In this study, the analysis focused on assessing the existence and adequacy of the inspection road at Juwata Tarakan Airport as a supporting element for aviation safety and security. The collected data—derived from observations, interviews, and relevant secondary sources—were systematically processed to generate insights that address the research objectives.

The analytical framework adopted in this research follows the interactive model proposed by Miles, Huberman, and Saldaña (2014), which consists of four interconnected stages: data collection, data reduction, data display, and conclusion drawing/verification. These stages are iterative rather than strictly linear, allowing the researcher to revisit and refine earlier steps as new insights emerge during fieldwork.

The data collection stage involved gathering information from multiple sources, including observation checklists, interview transcripts, and photographic documentation of the current condition of the inspection road. This stage ensured that both primary and secondary data were available to form a comprehensive picture of the research phenomenon.

The second stage, data reduction, involved selecting and focusing on the most relevant information related to the analysis of the inspection road's existence and condition. Data that did not align with the research objectives—such as informants' statements unrelated to inspection road functionality—were set aside. This process of condensing data helped clarify patterns and facilitated more targeted interpretation.

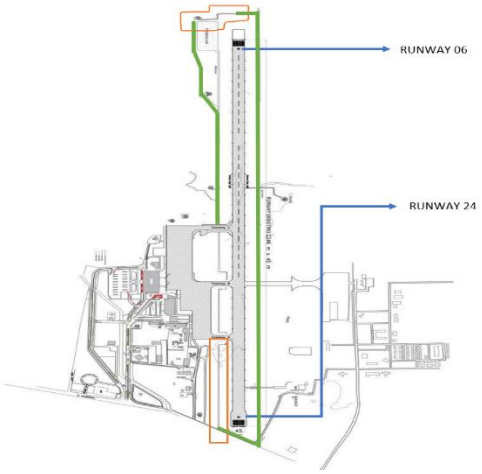
Following reduction, the data display stage was carried out by presenting the information descriptively. The findings were organized to clearly depict the current state of the inspection road, its accessibility, physical condition, and its role in facilitating perimeter patrols. Data presentation was designed to enable logical interpretation and ensure the flow from evidence to findings was transparent.

Finally, the conclusion drawing and verification stage involved synthesizing the displayed data to arrive at final interpretations and insights. Verification was achieved through source triangulation, in which data obtained from different informants were compared to ensure their validity and reliability. This process ensured that the conclusions reflected accurate, corroborated, and well-supported interpretations of the observed reality.

By employing the Miles and Huberman interactive model, this study maintained a cyclical and reflective approach to qualitative analysis, enabling the continuous refinement of findings while ensuring methodological rigor and credibility (Miles et al., 2014).

3. RESULT AND DISCUSSION

This study employed three primary data collection techniques—observation, interview, and document review—to examine the condition and adequacy of the inspection road at Juwata Tarakan Airport in supporting aviation safety and security. Observations were conducted using a passive participant approach, in which the researcher was physically present to witness activities in the field but did not directly participate. The focus was on assessing the existence and condition of the inspection road within the airport's airside perimeter, particularly around runway 24 and runway 06.



Analysis of the airfield layout (Figure 4.1) revealed that the inspection road does not fully encircle the perimeter as mandated by the *Minister of Transportation Regulation No. 167/2015* (PM 167/2015). The road is partially available along the southern section of runway 24, while no equivalent access exists around runway 06. This limitation hinders Aviation Security (Avsec) officers in conducting safe and efficient perimeter patrols, as they must sometimes traverse active taxiways or runways to reach certain inspection points.

Further field observations (Figure 4.2) showed that the existing segment of the inspection road near runway 24 is unpaved, uneven, and lacks road markings and proper drainage. Potholes and water pooling during rainfall impede vehicle movement, and the unsealed surface presents operational challenges during adverse weather. In contrast, the runway 06 area has no inspection road at all, forcing Avsec patrol vehicles to cross active operational areas—a practice that increases both safety risk and operational disruption. Documentation from inspections in this area confirms that patrols must wait for Air Traffic Control (ATC) clearance before proceeding, creating delays in perimeter security operations.

3.1 Observational Insightss

From an operational standpoint, the absence of a continuous inspection road compromises patrol mobility and response times during emergencies. It also increases dependency on ATC coordination and elevates the risk of runway incursions. Compared to major airports such as Soekarno–Hatta, where fully paved and marked inspection roads are integrated into the perimeter security system, Juwata Tarakan's infrastructure falls short of compliance with PM 167/2015, which explicitly requires an inspection road surrounding the perimeter for security patrol purposes (*Kementerian Perhubungan Republik Indonesia*, 2015).

3.2 Interview Findings

Interviews with the Head of Avsec Unit, a security shift commander, and a field officer corroborated the observational findings. All respondents acknowledged that the inspection road is incomplete, particularly in the runway 06 area, which consists of marshland. This terrain poses significant construction challenges, requiring land stabilization before paving. The absence of road markings, uneven surfaces, and the dominance of gravel and soil were identified as key deficiencies that prevent the road from meeting regulatory standards.

Respondents agreed that where inspection roads are available—such as near runway 24—they significantly enhance patrol efficiency, allowing vehicles to reach perimeter areas without crossing active runways. However, in the absence of such roads, patrols become less effective, slower, and potentially hazardous. The lack of supporting facilities such as continuous lighting, Closed-Circuit Television (CCTV), and clear signage was also identified as a major operational gap. Current installations are sparse and not strategically positioned in high-risk zones such as the runway 06 perimeter.

Maintenance activities are largely limited to clearing vegetation, with no resurfacing or structural repairs conducted in recent years. While Foreign Object Debris (FOD) incidents are rare—owing to rigorous pre-flight inspections—wildlife hazards, such as monitor lizards and civets, are more common in the marshland areas near runway 06. These intrusions are harder to prevent without a dedicated inspection road to enable proactive patrolling. In emergency scenarios, officers confirmed that response speed is significantly hindered when access roads are absent, requiring detours across operational surfaces and ATC clearance before intervention.

3.3 Documentary Evidence

Supporting documentation, including inspection schedules, patrol logs, and photographic evidence, reinforced the field findings. Patrol schedules indicate routine perimeter checks every two hours and prior to aircraft landing, in line with Standard Operating Procedures (SOPs). However, logs show delays and operational constraints in areas lacking inspection roads. Photographs confirm the poor physical condition of the existing paths and the absence of supporting security infrastructure.

Regulatory documents, particularly *PM 167/2015* and *Ministerial Regulation No. 36/2021*, clearly state that inspection roads must be part of airside security infrastructure, designed to facilitate efficient patrol and rapid emergency response. Compliance requires paved surfaces, adequate width, proper markings, drainage systems, and supplementary facilities such as lighting and surveillance systems.

3.4 Literature-Based Context

Previous studies align with these findings. Perangin (2019) emphasized that inspection roads must meet design standards—paved surfaces, road markings, and auxiliary facilities—to optimize Avsec patrol effectiveness [10]. [11] Natasya (2021) similarly found

that damaged perimeter fencing and inadequate surveillance infrastructure elevate security risks, particularly in airports without continuous inspection road access. These parallels underscore that Juwata Tarakan's current configuration represents a significant operational gap in perimeter security readiness.

3.5 Synthesis and Implications

Overall, the results highlight a substantial disparity between the current state of Juwata Tarakan Airport's inspection road infrastructure and national regulatory requirements. The lack of a continuous, paved, and fully equipped inspection road limits operational efficiency, slows emergency responses, and increases exposure to security breaches and wildlife hazards. Addressing these deficiencies will require both infrastructural investment—particularly in constructing the runway 06 perimeter road—and strategic deployment of support facilities such as CCTV, lighting, and signage.

Given that inspection roads form an integral component of an airport's *airside safety and security ecosystem*, their absence or inadequacy directly undermines compliance with PM 167/2015 and compromises the operational integrity of perimeter patrols. A targeted development program to build, upgrade, and integrate the inspection road network is therefore essential to meet both regulatory compliance and international best practice standards in airport safety management.

4. CONCLUSION

Based on the findings obtained through observation, interviews, and documentation at Juwata Tarakan International Airport, as well as the subsequent analysis of the collected data, it can be concluded that the current security patrol activities conducted by Aviation Security (Avsec) personnel around the airport perimeter are not yet operating at an optimal level due to the inadequate condition of the inspection road. The existing inspection road only partially covers the southern side of Runway 24, while no such facility is available along the perimeter of Runway 06. This absence compels Avsec personnel to cross active taxiways and runways in order to reach certain sections of the perimeter fence. Such conditions not only pose a significant safety risk but also reduce the effectiveness of routine perimeter patrols, especially during periods of heightened operational activity (Ministry of Transportation Regulation No. 167/2015).

The primary challenges in maintaining effective perimeter surveillance are rooted in insufficient infrastructure. These include the lack of a permanent inspection road, uneven or muddy surfaces, absence of road markings, inadequate lighting, and limited Closed-Circuit Television (CCTV) coverage along critical sections of the patrol route. In addition, operational constraints arise when Avsec personnel must wait for clearance from Air Traffic Control (ATC) before crossing active runways, which can significantly delay emergency response times. Such limitations contrast sharply with best practices and infrastructure standards outlined in existing aviation safety regulations (PM 36/2021) and prior research highlighting the importance of a fully functional and well-equipped inspection road in enhancing airport security (Perangin, 2019; Natasya, 2021).

To address these shortcomings, it is recommended that the airport authority prioritize the immediate construction of a continuous, regulation-compliant inspection road around the entire airside perimeter, with particular attention to the currently inaccessible areas near Runway 06. The road should be constructed with a durable surface, proper road markings, and adequate drainage to ensure year-round operability. Furthermore, supporting infrastructure such as strategically positioned CCTV units, consistent lighting, and safety signage should be integrated along the entire length of the route to facilitate nighttime patrols and improve real-time monitoring of the perimeter.

Regular evaluation and preventive maintenance of both the inspection road and its supporting facilities should be institutionalized to ensure long-term functionality and readiness for emergency situations. Additionally, transitioning from a manual logbook system to a digital patrol recording system would enhance data accuracy, facilitate historical data retrieval, and reduce the risk of data loss or physical damage to records.

By implementing these recommendations, Juwata Tarakan International Airport will be better positioned to align its security operations with national and international aviation safety standards, thereby significantly enhancing the effectiveness of its perimeter surveillance, improving emergency response capabilities, and strengthening overall operational safety and security in a sustainable manner.

REFERENCES

[1] Chaksono, Fanji, Agoes Soebagio, and Lina Rosmayanti. "Kajian Jalan Inspeksi (Check Road) Guna Meningkatkan Keamanan di Sisi Udara Bandar Udara Adi Soemarmo Boyolali." *Flight Attendant Kedirgantaraan: Jurnal Public Relation, Pelayanan, Pariwisata* 7.1 (2025): 1-7.

[2] Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 167 Tahun 2015 tentang Prosedur Operasi Standar Penanganan Keterlambatan Penerbangan di Bandar Udara

[3] Rukajat, Ajat. *Pendekatan penelitian kualitatif (Qualitative research approach)*. Deepublish, 2018.

[4] Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta

[5] Suharsimi, Arikunto. "Prosedur penelitian suatu pendekatan praktik." *Jakarta: rineka cipta* 134 (2006): 252.

[6] Susanto, Candra, R. Y. Pratama, and D. A. Lestari. *Konsep Penelitian Kuantitatif: Populasi, Sampel, dan Analisis Data*. Green Publisher, 2024

[7] Sugiyono. (2017). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung. Alfabeta

[8] International Civil Aviation Organization (ICAO). *Annex 14 – Aerodromes*. Volume I: Aerodrome Design and Operations. Montreal: ICAO.

[9] Federal Aviation Administration (FAA). *Civil Aviation Safety Regulation (CASR) Part 139 – Certification of Airports*. United States Department of Transportation.

[10] Angin, Andi Frianto Perangin, Andung Luwihono, and Faizal Zaini. "Standarisasi Jalan Inspeksi/Check Road Guna Meningkatkan Keamanan di Sisi Udara Bandar Udara Internasional Jenderal Ahmad Yani Semarang." *SKY EAST: Education of Aviation Science and Technology* 1.1 (2023): 38-52.,

[11] Febrianti, Natasya. Kajian Pengamanan ParimeterGuna MeningkatkanKeselamatan dan Keamanan Penerbangan di Bandar Udara Internasional Sultan Mahmud Badaruddin-II Palembang. Diss. Politeknik Penerbangan, 2023