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IMPACT OF NOISE LEVELS ON OPTIMIZING FLIGHT INFORMATION SERVICES AT PERUM LPPNPI

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Abstrak: Kebisingan merupakan bunyi yang tidak dikehendaki yang mempunyai intensitas tinggi, frekuensi tidak teratur, atau berasal dari sumber yang dapat mengganggu aktivitas manusia sehari-hari (Bies & Hansen, 2009). Peraturan Menteri Ketenagakerjaan Nomor 5 Tahun 2018 yang mengatur tentang nilai ambang batas variabel fisik di tempat kerja, termasuk kebisingan. Tujuan penelitian ini adalah menganalisis pengaruh intensitas kebisingan terhadap optimalisasi pelayanan informasi penerbangan di Perum LPPNPI Unit Kotabaru. Penelitian ini menggunakan metode deskriptif kuantitatif melalui teknik observasi dan kuesioner dengan menggunakan skala likert. Kuesioner merupakan alat yang digunakan untuk mengumpulkan data dengan cara memberikan serangkaian pertanyaan kepada responden. Alat ini sering digunakan dalam penelitian kuantitatif untuk memperoleh informasi yang relevan sesuai dengan tujuan penelitian (Creswell, 2014; Sekaran & Bougie, 2016). Alat ini memudahkan dalam pengumpulan informasi secara teratur dan efisien. Hasil penelitian ini menunjukkan bahwa kebisingan pesawat udara yang terus menerus dapat menimbulkan gangguan non-pendengaran yang signifikan, dengan gangguan emosional tercatat sebesar 60,41% dan saturasi informasi mencapai 89,58%. Penelitian ini menunjukkan bahwa kebisingan dari pesawat udara dapat memberikan dampak negatif yang signifikan terhadap kinerja petugas Aerodrome Flight Information Service (AFIS), terutama dalam hal kemampuan untuk melakukan koordinasi secara efektif dan memberikan layanan informasi penerbangan yang optimal. Kebisingan tinggi yang sering terjadi di sekitar area operasional bandara dapat mengganggu konsentrasi dan fokus petugas dalam menjalankan tugasnya, serta memengaruhi efektivitas komunikasi antara petugas AFIS dan pilot. Kebisingan yang tidak terkendali di area kerja dapat mengurangi akurasi dan kecepatan penyampaian informasi yang dibutuhkan dalam situasi penerbangan yang mendesak, sehingga berisiko mengganggu kelancaran operasional penerbangan.

Kata Kunci: AFIS, Bandara, Gangguan, Intensitas, Kebisingan, Kinerja, Optimasi.

Abstract: *Noise is an unwanted sound that has high intensity, irregular frequency, or comes from a source that can interfere with human daily activities (Bies & Hansen, 2009). Regulation of the Minister of Manpower Number 5 of 2018 which regulates the threshold value of physical variables in the workplace, including noise. The purpose of this study was to analyze the effect of noise intensity on the optimization of flight information services at the Perum LPPNPI Kotabaru Unit. This study uses a descriptive quantitative method through observation techniques and questionnaires using a Likert scale. A questionnaire is a tool used to collect data by giving a series of questions to respondents. This tool is often used in quantitative research to obtain relevant information in accordance with research objectives (Creswell, 2014; Sekaran & Bougie, 2016). This tool facilitates the collection of information systematically and efficiently. The results of this study indicate that continuous aircraft noise can cause significant non-auditory disturbances, with emotional disturbances recorded at 60.41% and information saturation reaching 89.58%. This study shows that noise from aircraft can have a significant negative impact on the performance of Aerodrome Flight Information Service (AFIS) officers, especially in terms of the ability to coordinate effectively and provide optimal flight information services. High noise, which often occurs around the airport operational area, can disrupt the concentration and focus of officers in carrying out their duties, as well as affect the effectiveness of communication between AFIS officers and pilots. Uncontrolled noise in the work area can reduce the accuracy and speed in providing the information needed in urgent flight situations, which risks disrupting the smoothness of flight operations.*

Keywords: *AFIS, Airport, Disturbance, Intensity, Noise, Performance, Optimization.*

INTRODUCTION

In order to achieve the objectives of safe, smooth, orderly, controlled, and efficient aviation operations, the Kotabaru branch of Perum LPPNPI, particularly the flight communication officers under the Aviation Department, is obligated to provide Flight Information Service and Alerting Service. Additionally, these officers carry out several other responsibilities, including maintaining a logbook, transmitting FPL and ATS messages, collecting and archiving communication data, verifying operational readiness, preparing required forms, and notifying technicians of any facilities that require repair or replacement. According to the Aeronautical Information Publication (AIP), the Kotabaru Unit of Perum LPPNPI operates between 23:00 and 07:30, with two shifts per day. This unit is responsible for air traffic services up to 4,000 feet above ground level and within a horizontal radius of 5,000 meters from the Non-Directional Beacon (NDB).

According to ICAO Document Annex 11: Air Traffic Services (12th ed., 2018), the primary objectives of air traffic services are based on five fundamental principles: (1) Prevent collision beetwen aircraft, (2) Prevent collision beetwen aircraft on the manouvering area and obstruction on that area, (3) Expedite and maintain and orderly flow of air traffic, (4) Provide advice and information usefull for the safe and efficient conduct of flight, and (5) Notify appropriate organization regarding aircraft in need search and rescue aid,and assist such organization as required. These principles form the cornerstone of efficient air traffic operations and necessitate a meticulous and supportive work environment. This demonstrates the critical role of air traffic services in maintaining the safety and reliability of aviation operations, which are integral to the overall functioning of the industry.

A workplace is defined as the location where employees perform their daily tasks (Latif et al., 2022). A conducive work environment provides employees with a sense of security and encourages optimal performance. However, employees may encounter workplace stressors, which are broadly categorized into chemical, physical, biological, and psychological stressors. Noise stress is one of the most common physical stressors observed in workplace settings (Budiono, 2017). Continuous exposure to such stressors, particularly noise, can lead to decreased concentration, increased fatigue, and potential long-term health consequences for employees.

At the Kotabaru Unit of Perum LPPNPI, the close proximity of the control tower to the apron indicates that the noise generated by aircraft during engine startup and taxiing frequently interferes with the ability of Aerodrome Flight Information Service (AFIS) officers to deliver flight information services effectively. Furthermore, the three-story height of the control tower has a significant impact on noise levels experienced by personnel. This highlights the unique challenges faced by aviation professionals, especially those operating in environments with high levels of noise pollution.

The maximum permissible noise level (measured at the operator's normal microphone position) should not exceed 65 dB (40 dB weighted), with sporadic peaks of up to 70 dB permitted during the takeoff of large jet-engine aircraft, as stipulated in CASR 172 Chapter 10.4.1 of the Kotabaru Unit's 2016 regulations. These restrictions underscore

the critical importance of maintaining controlled noise levels within operational environments. Compliance with these regulations not only ensures the safety of operations but also protects the well-being of communication officers.

Given the challenges posed by noise stress and its potential to disrupt operational efficiency and safety, further research in this field remains imperative. Investigating the impact of noise on aviation communication officers' performance, particularly during shift transitions, is crucial for formulating strategies to mitigate its adverse effects and ensure uninterrupted service quality. Moreover, such studies are essential for developing evidence-based interventions aimed at enhancing workplace conditions and fostering long-term sustainability in the aviation sector.

RESEARCH METHOD

This study employs a quantitative approach to collect numerical data, which is then analyzed statistically. This approach is rooted in the philosophy of positivism, which posits that phenomena can be objectively measured through concrete data that can be empirically tested (Bryman, 2016). The quantitative method enables researchers to examine relationships between variables using data obtained from predefined samples or populations (Neuman, 2014). The data collected through appropriate instruments is subsequently analyzed using quantitative statistical techniques, with the aim of testing the formulated hypotheses (Field, 2013).

The quantitative approach is particularly suitable for obtaining a clear and measurable depiction of the phenomena under investigation. This method allows researchers to analyze data in numerical form, test relationships between variables, and derive findings that can be generalized to a broader population (Cohen et al., 2011). By analyzing data using appropriate statistical techniques, researchers can test and confirm existing theories or hypotheses, as well as measure the strength of relationships between the variables under study. As explained by Creswell (2014), quantitative research relies on structured data collection and statistical analysis to produce valid and reliable conclusions. The primary goal of this approach is to provide an objective depiction of the phenomenon being studied and to test the proposed hypotheses. This structured approach

ensures that the research outcomes are grounded in empirical evidence, thereby enhancing their scientific rigor and practical applicability.

This study involves Aerodrome Flight Information Service (AFIS) officers at the Kotabaru Unit of Perum LPPNPI and cadets who have completed their On-The-Job Training (OJT) programs in the same field as the population. The sample used in this study includes all individuals within this population, namely AFIS officers and OJT cadets. The main focus of the study is to examine the impact of noise levels on the optimization of flight data services at the Kotabaru Unit of Perum LPPNPI. The inclusion of both professional officers and cadets provides a comprehensive perspective on how noise affects operational efficiency across different levels of experience.

Data Collection Techniques And Research Instruments

Observation is a data collection method conducted through direct observation of objects or phenomena relevant to the research topic. This method allows researchers to obtain more detailed and concrete data regarding the situation being studied, providing a clearer depiction of field conditions (Creswell, 2014). In this study, observation is employed as a key stage in data collection, particularly during the implementation of on-the-job training at the Kotabaru Unit of Perum LPPNPI. The focus of the observation is on the Aerodrome Flight Information Service (AFIS), which plays a critical role in aviation by providing weather and air traffic information around the airport. Direct observation during AFIS training offers deeper insights into the practices employed and the challenges encountered during the training process (O'Leary, 2017). This hands-on approach ensures that the researcher captures nuanced operational details, fostering a more comprehensive understanding of the training dynamics and their impact on service delivery.

In addition to observation, this study utilizes a questionnaire as a tool for data collection. Questionnaires are widely used in quantitative research due to their efficiency in gathering information from a large number of respondents within a relatively short time and at a lower cost (Sekaran & Bougie, 2016). In this research, questionnaires are used to explore data related to the attitudes, perceptions, and experiences of training participants

regarding AFIS, which is the main focus of the study. The questionnaire consists of a series of questions designed to elicit information relevant to the research objectives (Creswell, 2014). By combining observational data with questionnaire responses, the study achieves a balanced approach, enabling the validation of findings through multiple sources.

This study employs a Likert scale in the questionnaire, which, according to Sugiyono (2018), is an effective tool for measuring attitudes, beliefs, and perceptions of individuals or groups toward a social issue. The Likert scale works by converting measured variables into measurable indicators, such as a rating range from "strongly agree" to "strongly disagree." This enables researchers to assess the strength or intensity of respondents' attitudes or opinions toward statements included in the questionnaire. The Likert scale provides in-depth quantitative data about participants' views and attitudes toward AFIS training. Through the use of a Likert-scale questionnaire, researchers can draw more objective and representative conclusions regarding participants' perceptions of the conducted training (Sugiyono, 2018; Babbie, 2013). Furthermore, the application of this scale enhances the study's ability to quantify complex perceptions, offering valuable insights for program evaluation and improvement.

Table 1. Questionnaire Scores

Score	Code	Information
4	SA	Strongly Agree
3	A	Agree
2	DA	Don’t Agree
1	SD	Strongly Disagree

The interval (range) to be used for interpreting the questionnaire data is first determined by the researcher:

Formula for Determining the Interval (Range):

I = 100 / Maximum Likert Score

Thus,

I = 100 / 4

I = 25

Therefore, the interval serves as the basis for interpreting scores, as illustrated below.

Table 2. Questionnaire Interval

Interval	Criteria
0% - 24,99%	Strongly Agree
25% - 49,99%	Don’t Agree
50% - 74,99%	Agree
75% - 100%	Strongly Disagree

Data Analysis Techniques

Quantitative research with a descriptive approach focuses on collecting data in the form of numbers or measurable information that describes a specific phenomenon. This approach relies on concrete and objective data, which is a characteristic of quantitative research (Creswell, 2014). The data collected in this type of study is often in the form of measurements that can be statistically analyzed to identify patterns or relationships between the variables being studied (Neuman, 2014). Statistics serve as tools for processing and testing the data, ultimately yielding conclusions that can be applied to a broader population (Babbie, 2013).

In the descriptive approach, researchers do not alter or modify the data collected but instead present or describe the existing conditions at the time of the study (Sekaran & Bougie, 2016). This approach is highly effective in providing a general overview of the characteristics of the objects or subjects being studied without engaging in more complex hypothesis testing (O'Leary, 2017).

In descriptive quantitative research, the results of the analysis are generally presented in the form of descriptive statistics, such as frequencies, averages, or distributions, which provide detailed information about the variables being studied (Babbie, 2013). The data obtained through this method is often used to formulate new research questions that can deepen the understanding of the topic under investigation (Creswell, 2014). Although descriptive research is not intended to draw causal conclusions, the findings still offer valuable insights for the development of further research. These insights not only enhance the foundational knowledge of the studied phenomenon but also contribute to practical applications and theoretical advancements in the field.

RESULT AND DISCUSSION

Based on the results of observations, noise measurements conducted, and questionnaires distributed to the Aerodrome Flight Information Service (AFIS) personnel stationed at the Kotabaru Unit of Perum LPPNPI, as well as to cadets who have completed their On-The-Job Training (OJT) at the same unit, the author aims to gain a deeper understanding of how AFIS officers and cadets adapt to the noise levels present in the airport environment. This study seeks to understand how they manage noise, whether originating from aircraft takeoffs, landings, or other activities occurring on the airport apron, which often generate high noise levels.

The primary focus of this study is to understand how the noise in the control tower can affect the communication and concentration of AFIS personnel, whose main responsibilities include providing accurate and clear information to aircraft and maintaining effective coordination on the ground. Noise generated during aircraft operations can disrupt the flow of critical information being conveyed, which in turn can impact the effectiveness of the services provided. Therefore, this research aims to analyze the extent to which noise from aviation activities influences the performance of AFIS personnel in executing their duties optimally (Karwowski, 2012).

Additionally, the author evaluates the impact of noise on the quality of services provided by the AFIS unit. Excessive noise can impair the ability of personnel to clearly hear critical instructions from pilots or other air traffic controllers. This impairment may hinder effective and efficient decision-making, posing significant risks to aviation safety. This study also explores whether noise acts as a factor affecting personnel performance and potentially jeopardizes operational safety at the airport.

The noise measurement data collected will provide a solid foundation for assessing the impact of noise on the work of AFIS personnel. These measurements are conducted using appropriate tools to ensure accurate and reliable results. Based on this data, the author will analyze further whether there is a direct relationship between high noise levels and disruptions to AFIS personnel performance (O'Neill, 2009).

By combining the results of observations, noise measurements, and questionnaires provided to personnel and cadets, the author hopes to gain a deeper understanding of how

noise affects the work quality of AFIS personnel. It is expected that the findings of this study will offer valuable recommendations, such as the implementation of noise-canceling technologies or structural redesigns of the control tower, in order to reduce disruptive noise, improve the working comfort of AFIS personnel, and ensure safety and operational efficiency at the airport.

The following is the data from the noise measurement results that the author has conducted at the Perum LPPNPI Kotabaru Unit tower:

Table 3. Average Results of Noise Calculation

No.	Aircraft Type	Duration of Exposure	Average Noise	NAB
1	ATR72	30 Menit	127.3 dbA	97 dbA
2	CN295	30 Menit	127.4 dbA	97 dbA
3	BONANZA	30 Menit	127.1 dbA	97 dbA

In this study, the author distributed a questionnaire to respondents to assess the impact of noise on flight information services. The questionnaire contained several statements designed to measure how respondents perceive the disruption caused by noise in the Aerodrome Flight Information Service (AFIS) tower and how this affects their performance. Each statement in the questionnaire was assessed using a Likert scale, a method commonly used in quantitative research to measure attitudes, perceptions, or the level of agreement of respondents with various statements (Likert, 1932; Sekaran & Bougie, 2016).

After the questionnaire was completed by the participants, the collected data were processed using Microsoft Excel. The use of Excel allowed the researcher to efficiently process data from the Likert scale, converting the respondents' answers into numerical values that could be computed and further analyzed. Once the data were gathered, analysis was conducted using the mode analysis method, which is employed to determine the most frequent value or the statement most often selected by the majority of respondents. This method provides a clear picture of the majority's perspective on the impact of noise on AFIS performance (Siregar, 2018). With this approach, the researcher can draw conclusions based on the perspective of the majority of respondents, reflecting the general view on the researched topic.

The mode analysis method is widely used in quantitative research due to its ability to show consensus or the preferences of the majority without being affected by extreme values that may arise in other distribution analyses such as the mean or median. The results of this mode analysis assist the researcher in offering recommendations or necessary corrective actions, particularly in efforts to reduce the impact of noise that can affect the performance of flight services (Denscombe, 2014).

RESPONDENTS	QUESTIONNAIRE RESULTS DATA STATEMENT												TOTAL SCORES	MAXIMUM SCORE	PERCENTAGE	AVERAGE PERCENTAGE
A	4	4	2	4	4	4	4	4	2	4	1	4	41	48	84,1666667	
B	4	3	2	4	4	4	4	4	1	4	1	4	39	48	81,25	
C	4	4	2	2	4	4	4	4	2	4	2	4	40	48	83,33333333	
D	3	3	2	3	3	3	3	3	3	3	2	3	34	48	70,83333333	
E	4	4	2	4	4	4	4	4	1	4	1	4	40	48	83,33333333	
F	3	3	2	3	3	3	3	3	2	3	2	3	33	48	68,75	
G	3	3	3	3	3	3	3	3	3	3	2	3	35	48	72,91666667	78,81944444
H	3	3	2	3	3	3	3	3	3	3	2	3	34	48	70,83333333	
I	4	4	1	4	4	4	4	4	4	4	1	4	48	48	87,5	
J	4	4	4	1	4	4	4	4	2	4	2	4	40	48	83,33333333	
K	3	3	3	3	3	3	3	3	3	3	1	3	35	48	7,29166667	
L	4	3	2	3	4	4	4	4	3	4	2	4	41	48	8,54166667	
TOTAL SCORES	43	41	27	37	43	43	43	43	29	43	19	43				
MAXIMUM SCORE	48	48	48	48	48	48	48	48	48	48	48	48				
PERCENTAGE	89,5833	85,4167	56,25	77,0833	89,58333333	89,58333333	89,58333333	89,58333334	60,41667	89,58333334	39,5833	89,58333334				
AVERAGE PERCENTAGE	78,81944444															

Figure 1. Results of Likert Scale Calculation

The impact of disruptions on the optimization of flight information services at the Perum LPPNPI Kotabaru Unit can be clearly seen in ***Figure 1***. Based on the analysis of the obtained data, the average percentage of respondents for statements 1 through 12 shows a value of 78.81%, placing the result in the ***Strongly Agree*** category. This indicates that the disruptions at the Perum LPPNPI Kotabaru Unit have a significant impact on the performance of Aerodrome Flight Information Service (AFIS) personnel in providing optimal flight information services. These disruptions, whether caused by noise, communication issues, or other environmental factors, can hinder the effectiveness and efficiency of personnel in performing their duties. As a consequence, the quality of service provided to aircraft passing through the area is affected, potentially lowering the level of safety and smooth operational flow of flights. Therefore, it is crucial to identify and address these disruptions to ensure that flight information services continue to function optimally and support improved aviation safety.

Discussion

The impact of noise on the operations of the Aerodrome Flight Information Service (AFIS) has become an issue that requires attention, particularly concerning disruptions that may arise from high noise levels around the airport control tower. Based on the findings of this study, several risks and issues that emerge due to noise in the AFIS area include:

Disruption of Coordination and Communication between Controllers and Pilots

One of the primary consequences of noise is disruption in communication between air traffic controllers (ATC) and pilots. High noise levels can obstruct the controller's ability to deliver instructions clearly or hear necessary information from pilots, such as weather conditions or service requests. This disruption can pose safety risks, especially when there is inaccuracy in providing needed information or unclear instructions, which could jeopardize the flight (Kraemer, 2014). For instance, if a controller fails to give the instructions requested by the pilot or if the information delivered is not clearly heard, this could result in navigation errors or incorrect decision-making.

Impaired Effectiveness of Flight Information Services

Another impact caused by noise is the inability of flight information services to operate effectively. When noise from aircraft or apron activities disrupts communication, reports from pilots may not be clearly heard and need to be repeated. This repetition not only wastes time but also increases the workload of personnel and can potentially lead to errors in the transmission of information (Muller et al., 2017). This, of course, reduces the efficiency and speed of the services provided by AFIS, which is critical to the safety and smooth operation of flights.

The Non-Soundproof Control Tower as the Primary Source of Noise

The non-soundproof nature of the AFIS tower is the primary cause of this noise. The sound of aircraft taking off or moving on the apron can be heard very clearly in the control room, which can disrupt the concentration of AFIS personnel on duty. This situation clearly contradicts regulations issued by the Directorate General of Air Transport (DGCA), as outlined in the CASR 170 Air Traffic Rules Sub Part 170.061 ATS Operational

Requirements, which emphasize that disruptive noise is not permitted to maintain the concentration of personnel. Additionally, the CASR 172 Perum LPPNPI Kotabaru Branch Chapter X on Human Factors mentions in point 10.4.1 that the allowable noise level should not exceed 65 decibels. Therefore, to reduce the impact of noise, it is recommended to implement changes, such as installing soundproofing in the AFIS control tower, to create a quieter work environment and enable AFIS personnel to work optimally without being disturbed by excessive noise (Gouin et al., 2019).

This study indicates that uncontrolled noise can disrupt the performance of AFIS personnel and reduce operational efficiency, ultimately posing a risk to aviation safety. Therefore, it is crucial to implement solutions that can mitigate noise, such as using soundproofing materials in accordance with the standards set by the relevant aviation authorities.

Efforts for Noise Management in AFIS Operations at Perum LPPNPI Unit Kotabaru

To ensure that Aerodrome Flight Information Service (AFIS) personnel at Perum LPPNPI Unit Kotabaru can work more comfortably without being disturbed by noise caused by aircraft movement on the apron or around the airport, the following strategic recommendations are proposed:

1. Noise Reduction in AFIS Workspaces

One approach to reducing disruptive noise is by installing an effective soundproofing system on the walls, floors, ceilings, and structures of the control tower. Using soundproof materials, such as acoustic panels, specialized glass, and sound-absorbing insulation, can help create a quieter and more comfortable working environment for AFIS personnel. Studies have shown that noise-free work environments can significantly enhance productivity, improve the overall focus and concentration of staff, and reduce worker stress (Hughes et al., 2017). This improvement in the workspace environment ultimately supports the ability of AFIS personnel to perform their duties more efficiently, ensuring a better quality of service and higher safety standards in aviation operations.

2. Constructing Sound Barriers Using Artificial Vegetation

Planting artificial vegetation or large trees around the airport area, especially near the AFIS tower, can serve as an effective natural sound barrier to absorb noise. Large plants with dense foliage, such as strategically placed trees and shrubs, can significantly reduce noise levels in the surrounding airport environment. Research indicates that vegetation is not only an environmentally friendly and cost- effective method for reducing noise but also an aesthetic improvement, enhancing the overall landscape of the airport. It contributes to improving AFIS personnel's working comfort, fostering a more relaxed and less stressful environment, and protecting the surrounding airport environment by reducing noise pollution and promoting biodiversity (Zona Pelantar Press, 2020). Additionally, this natural approach can support sustainable airport operations while ensuring a healthier working atmosphere for all personnel.

3. Using Headsets for More Effective Communication

To reduce the noise interference during communication between AFIS personnel and pilots or air traffic controllers, the use of high-quality, noise-canceling headsets is a great solution. With headsets equipped with advanced noise-canceling features, personnel can avoid misunderstandings or communication disruptions caused by aircraft noise, ensuring clearer transmission of vital information. This technology also helps AFIS personnel focus more effectively and maintain concentration on their tasks, which is essential for ensuring flight safety and operational efficiency (Foley & Ralston, 2021). Moreover, the use of headsets can significantly reduce mental fatigue and improve the overall comfort of personnel by minimizing exposure to persistent background noise, allowing them to perform their duties more efficiently and safely.

4. Personal Protective Equipment and Natural Barriers

In addition to enhancing the comfort of AFIS workspaces, protecting personnel working in apron areas is also critical. The use of personal protective equipment (PPE) such as high-quality ear protection or earplugs can help mitigate

the impact of noise on hearing and overall comfort. Furthermore, planting strategically positioned plants or other natural barriers can significantly reduce the noise exposure for workers and nearby communities. Research shows that natural barriers such as plants can reduce noise levels by 10-15 decibels, significantly improving the quality of life for nearby residents and the comfort of workers, while also contributing to the environmental sustainability of the area (Pertiwi, 2021).

By implementing these measures, it is expected that a safer and more comfortable working environment for AFIS personnel can be created, ultimately enhancing the quality of flight information services at Perum LPPNPI Unit Kotabaru. Better noise management will not only improve the well-being and health of AFIS personnel but also contribute to increased flight safety, operational efficiency, and the comfort of communities living around the airport. These initiatives play a crucial role in fostering a holistic approach to airport operations, benefiting both workers and the local environment.

CONCLUSION AND SUGGESTIONS

The results of data analysis and discussion indicate that aircraft noise generated during engine start-up and taxiing can disrupt the performance of Aerodrome Flight Information Service (AFIS) personnel, which in turn negatively impacts air traffic services. Such disruptions have the potential to cause misunderstandings, poor coordination, and ineffective air traffic management. This study also reveals that psychological disturbances experienced by AFIS personnel include emotional distress (60.41%), boredom (89.58%), and attention deficits (89.58%). These factors significantly impair decision-making abilities and can lead to a decrease in operational efficiency. To address these issues, two proposed solutions are the installation of soundproofing systems and the use of high-quality headsets. These measures are being implemented to enhance flight information services and to address long-standing challenges through improved collaboration and communication.

The author offers several recommendations to minimize disruptions at Perum LPPNPI Kotabaru Unit and optimize the provided flight information services. These

include reducing disturbances by constructing effective soundproof walls, roofs, frameworks, and floors. The use of headphones is also advised to mitigate the severity of disturbances and prevent misunderstandings or poor coordination. Furthermore, regular training on communication protocols can also help AFIS personnel better manage any residual noise interference. Given that such disturbances can have subjective (non-auditory) impacts on all personnel continuously exposed, AirNav regularly monitors Aerodrome Flight Information Service (AFIS) personnel to ensure comprehensive and effective mitigation, thus promoting a safer and more efficient operational environment.

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