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The Influence of the Jakarta Flight Information Center Medan Sector on Air Traffic Services at Palembang Approach Control Unit

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Abstract

The aviation industry is a strategic sector that supports both national and international connectivity. One common issue in this sector is the delay in transferring flight information between units, which can lead to potential aircraft conflicts and service delays. The Palembang Air Traffic Service (ATS) Unit under AirNav Indonesia, Palembang Branch, operates at Sultan Mahmud Badaruddin II Airport. Specifically, the Jakarta Flight Information Center (FIC) Medan Sector serves as a provider of Flight Information, Alerting, and Advisory Services within the Flight Information Region (FIR). This study aims to analyze the influence of the Jakarta FIC Medan Sector's role on the provision of air traffic services at the Palembang Approach Control Service Unit. Using a quantitative approach, data were collected through in-depth interviews, direct observation, and documentation studies. Informants were selected through a saturated sampling technique, consisting of 30 individuals directly involved in coordination between the two units. The results show that coordination, communication, and information support from the Jakarta FIC Medan Sector have not been fully optimized. It can be concluded that enhancing these aspects is essential to improve the efficiency and quality of air traffic services at the Palembang Approach Control Unit.

Keywords: Unit Role, Air Traffic Services

INTRODUCTION

The aviation industry is one of the strategic sectors supporting both national and international connectivity. Along with the rapid growth of air transportation in Indonesia, the need for a reliable, efficient, and safe air traffic management system has become increasingly crucial. In this context, coordination among Air Traffic Services (ATS) units is a key factor influencing the smooth operation of flights. One such coordination system is carried out by the Flight Information Center (FIC), which is responsible for providing flight information within specific airspace regions, as performed by the Jakarta FIC Medan Sector Unit (Darmawan, 2022).

In practice, the Palembang APP (Approach Control) Unit, which serves the airspace of South Sumatra, parts of Jambi, Bengkulu, and Bangka Belitung, often faces challenges in ensuring optimal air traffic services. This is closely related to its functional linkage with the Jakarta FIC Medan Sector Unit under the management of Jakarta FIC. The Jakarta FIC Medan Sector should play an active role in supporting real-time flight information dissemination, cross-sector coordination, and maintaining continuity of communication and control across airspace sectors. However, several issues arise in the implementation of these functions.

One common phenomenon is delays in the flight information transfer process between units, which may cause potential aircraft conflicts and service delays. The lack of digital integration among units and the persistence of manual communication in some coordination procedures increase the workload of ATC officers at the Palembang APP unit. Furthermore, aircraft handovers at sector boundaries are often not synchronized due to weak cross-sector oversight by the FIC, especially during heavy traffic or adverse weather conditions.

Another recurring issue is the lack of a shared understanding of coordination procedures between the Palembang APP and FIC Medan Sector units. Differences in interpreting standard operating procedures (SOP), limited joint training, and differing work cultures complicate

service harmonization efforts. In some cases, communication overload occurs, causing busy frequencies and reducing the effectiveness of air traffic management.

Another issue lies in technological and information system support. The incomplete integration of radar, flight data processing, and inter-unit communication systems results in some workflows remaining semi-manual. This significantly increases the potential for human error, ultimately affecting flight safety. Additionally, limited human resources in the FIC sector, both in terms of number and competence, hinder the optimization of the unit's role.

Considering these conditions, it is essential to conduct an in-depth analysis of the role of the Jakarta FIC Medan Sector Unit, particularly in its support of air traffic services at the Palembang APP. This research aims not only to identify the effectiveness and efficiency of the role performed but also to formulate strategies for optimizing the FIC's role in supporting overall air traffic safety and smoothness in the southern Sumatra region. Previous studies have examined air traffic services and inter-unit coordination. For example, Parke et al. (2014) highlighted weak cross-sector coordination during peak flight hours, while Wulandari (2021) discussed the role of the FIC in enhancing flight safety in the western Indonesian region.

However, few studies have specifically and comprehensively examined the functional relationship and performance between the FIC Medan Sector and Palembang APP. Previous research has generally remained broad and has not focused on the specific role of the FIC as a supporting unit for APP operations, especially in cross-airspace contexts. Therefore, this research fills a clear gap by analyzing the optimization of the FIC Medan Sector's role in directly and technically supporting Palembang APP operations. Through a focused and practical analysis, the findings are expected to contribute significantly to improving the national air traffic service system, particularly in enhancing inter-unit synergy.

The Air Traffic Service (ATS) Palembang APP Unit operates under AirNav Indonesia, Palembang Branch, located at Sultan Mahmud Badaruddin II Airport, Palembang. The AirNav Indonesia Palembang Branch supervises the implementation of air traffic service procedures and regulations set by ICAO, the Directorate General of Civil Aviation (Dirjen HUBUD), or local procedures.

Air traffic services at Palembang APP comprise approach control services within the airport's airspace. The Palembang APP unit oversees several sectors, including Palembang CTR/TMA, Pangkalpinang CTR/TMA, Tanjungpandan CTR, Jambi CTR, and Bengkulu CTR, all under the responsibility of AirNav Indonesia Palembang Branch. The unit employs 53 Air Traffic Controllers (ATCs), who may be assigned to different sectors daily based on personnel scheduling determined by the operations management team.

Operationally, this unit does not function independently but coordinates closely with the Jakarta FIC Medan Sector, especially in air traffic control and monitoring tasks. However, inter-unit communication and the optimization of FIC and Sector support are often overlooked, affecting service efficiency at Palembang APP. Operational observations have revealed situations where aircraft within the Jakarta FIC Medan Sector's control area remain on Palembang Radar or company frequency because they lack HF radio equipment required to contact Jakarta FIC Medan Sector.

Specifically, the Jakarta FIC and Medan Sector units provide Flight Information, Alerting, and Advisory Services within the Flight Information Region (FIR). This role is increasingly vital in ensuring smooth air traffic flow, especially in areas intersecting domestic and international flight routes, such as the Palembang APP region. The optimization of these services directly affects the quality of air navigation, safety, efficiency, and passenger comfort.

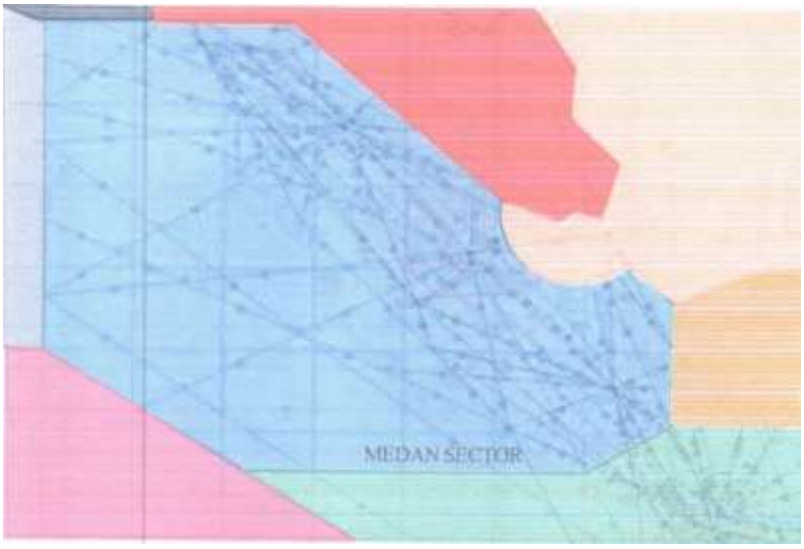

Figure 1.1 Jakarta FIC Medan Sector Map

Palembang APP and its subordinate sectors are located in southern Sumatra, where forest and land fires occur almost every year. The Climate Change and Forest and Land Fire Control Agency (BPPIKHL) for the Sumatra Region recorded 750.83 hectares of land burned in South Sumatra between January and July 2024 (Kompas.com, 2024). Based on data from the Forest and Land Fire Task Force, 1,506 fire incidents occurred in South Sumatra in 2024, with approximately ±1,191.44 hectares of land burned between January 1 and November 11, 2024 (Novitasari & Monik, 2025). During such events, BPBD deploys several helicopters for aerial patrols and water bombing operations.

The Bengkulu Approach Control (APP) Sector is responsible for air traffic services within the Bengkulu Control Zone (CTR), including the regulation, supervision, and coordination of flights overflying, landing, or departing from Fatmawati Soekarno Airport. Several scheduled flights serve passengers from Bengkulu to nearby regions such as Enggano, Krui, and Mukomuko. The BKL VOR frequently serves as a waypoint for aircraft traveling from the southeast to the northwest. Aircraft types used for these pioneering flights include the Cessna 208B Grand Caravan and Pilatus PC-6 Porter.

High-Frequency (HF) Radio is a shortwave communication system (3-30 MHz) used for long-range communication. According to Civil Aviation Safety Regulation (CASR) Part 91 and Part 135, issued by the Directorate General of Civil Aviation, HF radios are mandatory for aircraft operating over long distances in areas not covered by VHF communication systems. This ensures smooth communication between pilots and Air Traffic Controllers (ATC) to support flight safety. The use of HF radios must also comply with technical and operational standards, including regular inspection and maintenance procedures to ensure system reliability.

On June 14, 2025, a helicopter with registration PK-PMA, type EC 145, departed from Radin Inten Airport, Lampung (WILL), to Sultan Mahmud Badaruddin II Airport, Palembang (WIPP), via route TKG - TOLIT - BOLUD - RANTAU DADAP - PLB. ATC personnel at Inten Tower transferred the estimate to ATC Palembang APP, which then provided Palembang Radar and Medan Info frequencies along the route. Since PK-PMA was not equipped with an HF radio, it could not contact Medan Info. The helicopter last established communication with Inten Tower at 04:02 UTC and reestablished with Palembang Radar at 05:36 UTC. Therefore, PK-PMA remained out of communication for 1 hour and 34 minutes. As shown in Figure 1.2, PK-PMA's route crossed the Jakarta FIC Medan Sector area. During this period, ATC personnel at Palembang APP actively coordinated with several related units to locate PK-PMA.

Figure 1.2 PK-PMA Strip Marking

The background of this research originates from the operational dynamics of air traffic services in Indonesia, particularly within the Jakarta FIC Medan Sector's area of responsibility in supporting air traffic services at the Palembang Approach Control Unit (APP). In practice, coordination between these units is crucial due to the increasing complexity of air traffic alongside national aviation industry growth, as well as the rising demands for operational safety and efficiency.

RESEARCH METHODS

This study applied a quantitative associative approach, aiming to identify and analyze the influence of the Jakarta Flight Information Center (FIC) Medan Sector's role on the provision of air traffic services at the Palembang Approach Control Service (APP).

Subjects and Materials

The subjects of this study were 46 Air Traffic Controllers (ATCs) serving under the Palembang Approach Control Unit of AirNav Indonesia, Palembang Branch. Research materials included operational manuals, Letters of Operational Coordination (LOCA), and traffic management reports from AirNav Indonesia.

Tools and Instruments

The main research instrument was a Likert-scale questionnaire developed from the operational indicators of both variables:

a) The role of the Jakarta FIC Medan Sector (independent variable/X)
b) Air traffic service performance at Palembang APP (dependent variable/Y).

Supplementary instruments included documentation checklists and interview guidelines to ensure data triangulation. Statistical analysis was performed using SPSS version 26.

Research Design

This research employed a correlational design, examining causal relationships between independent and dependent variables to determine the significance and strength of influence.

Sampling Technique

A saturated sampling technique was used, meaning all 46 members of the population were selected as samples, as the population size was relatively small and homogeneous.

Variables

a) Independent Variable (X): The role of Jakarta FIC Medan Sector covering coordination, communication, and operational support.
b) Dependent Variable (Y): Air traffic service performance including response speed, accuracy, compliance, coordination, and safety efficiency.

Data Collection Techniques

a) Questionnaires distributed directly to ATC personnel.
b) Documentation analysis of internal AirNav reports, LoA documents, and ICAO procedures.
c) Observation and Interviews conducted to validate quantitative data and gain contextual understanding of coordination practices.

Data Analysis and Statistical Model

Data were analyzed using descriptive statistics and inferential tests. The analytical procedures included:

a) Validity and Reliability Tests using the Pearson Product Moment and Cronbach's Alpha methods.
b) Normality Test using the Kolmogorov-Smirnov test.
c) Correlation Analysis to measure the relationship strength between variables.
d) Simple Linear Regression to determine the degree of influence between variables.
e) t-test to test the hypothesis at a 95% confidence level ($\alpha = 0.05$).

The analytical model followed the Simple Linear Regression Equation:

$$Y = a + bX,$$

where *Y* represents the air traffic service variable, and *X* represents the role of the Jakarta FIC Medan Sector. All statistical tests were performed using SPSS v26, referring to Sugiyono (2019) and Ghozali (2020) for methodological guidance.

RESULT AND DISCUSSION

The study was conducted at the Palembang Approach Control Service (APP) Unit under AirNav Indonesia, Palembang Branch. This unit provides Air Traffic Services (ATS) in the southern Sumatra airspace, coordinating directly with the Jakarta Flight Information Center (FIC) Medan Sector in managing information flow and operational safety.

The demographic results indicate that respondents were balanced by gender and dominated by personnel aged 30-35 years, which reflects a productive workforce with adequate professional maturity. Most respondents held a Diploma 3 qualification, demonstrating sufficient academic competence to support operational performance.

The reliability and validity analyses confirmed that all questionnaire items met the statistical requirements, with Cronbach's Alpha exceeding 0.9 for both variables. This finding shows that the measurement instruments used were consistent and credible. Descriptive statistics revealed that the average score for the Jakarta FIC Medan Sector's role variable was categorized as good, though some variation existed among respondents, suggesting that communication and coordination effectiveness still differed across situations.

Most respondents agreed that data support from the Jakarta FIC Medan Sector enhances accountability in decision-making, which aligns with Darmawan (2022), who emphasizes that the quality of air traffic coordination depends on real-time information sharing. Furthermore, over two-thirds of respondents viewed inter-unit coordination as effective in preventing operational instruction errors, reflecting that the Medan Sector's function as an information intermediary has been successfully integrated into Palembang APP operations.

However, several respondents noted that coordination speed and data delivery still required optimization. These results align with findings by Wulandari & Prasetyo (2021), who observed that incomplete digital integration and procedural inconsistencies could hinder coordination efficiency between FIC and APP units. Although communication infrastructure such as the VCCS system is operational, procedural synchronization and real-time data transfer remain critical improvement areas.

The study also found that information support from the Jakarta FIC Medan Sector contributes to smoother aircraft separation and workload reduction for controllers. This is consistent with Wahyudi & Harahap (2020), who argue that an effective FIC should not only deliver information but also assist in conflict detection and advisory services to improve operational efficiency. Nevertheless, some respondents remained neutral regarding this contribution, indicating that not all personnel experience the full operational benefits of FIC support equally.

Regression analysis confirmed that the Jakarta FIC Medan Sector's role had a significant positive influence on air traffic service quality at Palembang APP, indicating that better coordination, timely information dissemination, and effective communication enhance operational performance. This finding supports the statement by Parke et al. (2014) that FIC serves as a central node connecting various ATS units, facilitating seamless air traffic control transfers.

In summary, the research demonstrates that although the Jakarta FIC Medan Sector has contributed significantly to improving the efficiency and reliability of air traffic services at Palembang APP, several operational aspects particularly communication speed, digital data integration, and procedural standardization require further optimization to ensure consistent and safe air traffic operations across the Sumatra region.

CONCLUSION

Based on the research findings regarding the influence of the Jakarta FIC Medan Sector's role on the provision of air traffic services at the Palembang Approach Control Service (APP), it can be concluded that coordination, communication, and information support from the Medan Sector have not been operating optimally. Operational information delivery is not always timely, responses to information requests tend to be slow, the information provided is not consistently current or relevant, and the reliability of communication equipment is considered inadequate, resulting in inconsistent aircraft communication. Coordination in accordance with the LOCA, as well as joint training or discussions to improve procedural understanding, are also perceived as irregular and inconsistent. Although some respondents acknowledged a positive impact on service performance, overall, the role of the Jakarta FIC Medan Sector does not have a significant influence on the quality of air traffic services at Palembang APP. Therefore, improvements in coordination, communication, information delivery, equipment reliability, and the consistent implementation of procedures and training are required to enhance work effectiveness and the quality of air traffic services. The hypothesis testing results also indicate that the role of the Jakarta FIC Medan Sector does not have a significant influence on the quality of air traffic services at Palembang APP.

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