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Study Of Work Procedures In The Airac System At The Aeronautical Information Center

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ABSTRACT
This study aims to assess the time efficiency of the work procedures in the publication of the Aeronautical Information Publication (AIP) at the Aeronautical Information Service (AIS) of the Indonesian Air Navigation Service Provider Agency. The study was conducted from October 2024 to March 2025 by employing observational methods, open questionnaires, and documentation analysis. Findings indicate that the current publication process utilizes a 28-calendar-day timeframe, which does not accurately reflect the actual working conditions due to limited human resources. The amendment process averages over 100 charts per cycle, peaking at 229 charts, while validation is manually performed by six active personnel. Data submission often surpasses deadlines, shortening processing time. Based on analysis of work stages, interviews, and documentation, an alternative timeframe with an ideal duration of 42 working days (54 calendar days) is proposed. Implementation of this optimization strategy is expected to enhance work efficiency and maintain the quality and sustainability of aeronautical information publication.

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INTRODUCTION

The Aeronautical Information Center (AIS), as part of AirNav Indonesia, plays a critical role in ensuring that aeronautical information is accurate, timely, and compliant with the Aeronautical Information Regulation and Control (AIRAC) cycle, as stipulated in ICAO Document 8126 [1]. The AIS publication process involves multiple stages, including data reception, drafting, quality control, validation, and dissemination [2], [3].

However, the current 28-calendar-day timeframe to complete these processes is limited, considering only 20 effective working days per AIRAC cycle. This limitation, exacerbated by increasing chart amendments [4], [5], results in workload pressure that may impact data quality. This study aims to develop an optimized work time allocation to improve efficiency and data accuracy in the AIS publication process.

METHODS

Research Design

This study applies a qualitative descriptive approach to explore the work procedures of AIS in the publication of Aeronautical Information Publications (AIP). This approach allows detailed observation and analysis of process inefficiencies and opportunities for optimization [6]. The independent variable in this study is the work procedures within the AIP publication process. The dependent variable is the work process time, specifically focusing on the timeline of AIP publication stages and their impact on efficiency [6].

Population, Sample, and Research Object

In qualitative research, the term population is not always relevant because the study typically begins with a specific case in a particular social context and then extends to other similar contexts [6]Therefore, this study does not define a traditional population but focuses on a specific case within the Aeronautical Information Center.

In qualitative research, the term sample refers to informants or key participants. The primary purpose of sampling in qualitative research is to generate theory rather than to generalize statistical findings [6]. This study applies purposive sampling to select publication and cartography personnel at the PIA unit who have worked for more than two years.

The research object is the main subject of the study, which can be individuals, groups, organizations, events, or phenomena explored and analyzed comprehensively [6]. The object of this study is the procedural system and work timeline of the PIA in the AIP publication process.

Data Collection Techniques and Research Instruments

Data collection techniques are methods used by researchers to gather information needed for analysis and drawing conclusions [6]. Observation allows for direct understanding of the workflow and duration of AIP publication stages. Open-ended questionnaires gather respondent perceptions of work efficiency and constraints. Documentation involves collecting standard operating procedures (SOP), historical amendment data, and internal reports, reviewed to strengthen the analysis [6].

Data Analysis Techniques

Data analysis technique is the process of processing and interpreting collected data to answer research questions or test hypotheses. Collected data were analyzed using thematic analysis, involving data transcription, reduction, and classification into emergent themes such as time constraints and workload coordination. Findings were cross-validated to ensure data reliability [6].

Place and Time of Research

This research was conducted at the Central Aeronautical Information Center (AIS) from October 2024 to March 2025. This location was selected for its role as the main service provider for AIP aeronautical information, facilitating direct observation and interviews with key personnel.

RESULT AND DISCUSSION

Results

A. Current Timeframe

This study employed direct observation, questionnaires, and documentation to investigate the AIRAC AIP Amendment publication process at AIS. It was found that the current publication process adheres to a 28-calendar-day cycle as specified by Standard Operational Procedure 001 concerning the Registration and Verification of Aeronautical Information Change/Addition Requests. The current timeline is compiled and illustrated in Figure 1.

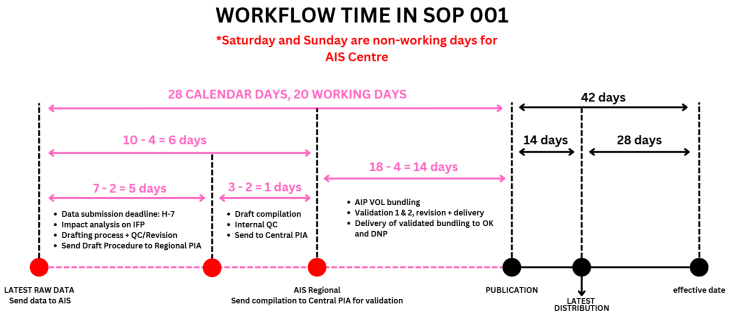

Figure 1 Workflow Time AIS in SOP 001

B. Workload and Production Capacity

Personnel workload data and the volume of charts produced by the cartography unit were evaluated based on internal personnel records. Table 1 and Table 2 below summarize the workload distribution and the number of chart changes analyzed.

Table 1 Calculation of AIS Personnel Work Process Load

Parameters	Drafting	Quality Control	Validation
Standard Process Time (Minutes)	839	341	1296
Number of Personnel (Publication and Cartography)	12	12	12
Effective Time per day (Minutes)	420	420	420
Daily Output	6	15	3.8
Process Time Allocation (Days)	10	5	4
Total Output 1 (One) AIRAC Cycle	60	73	16

From the table above, ideally, AIS personnel can process 60 charts in one cycle and perform QC for 73 charts, but for validation, only 16 charts within 28 calendar working days.

Table 2 Chart Data in AIRAC Publication 2024-2025

Amandment Number	Number of Chart Changes
AIP AMDT 136	101
AIP AMDT 140	139
AIP AMDT 141	148
AIP AMDT 142	102
AIP AMDT 143	130
AIP AMDT 148	158
AIP AMDT 151	116
AIP AMDT 152	96
AIP AMDT 155	229

Discussion

A. Current AIS Work Process is Not Optimal

The current 28-calendar-day timeframe for AIS personnel work process is divided into three main stages: drafting, quality control (QC), and validation before publication. Findings indicate that the time allocation is unstable and does not sufficiently accommodate workload variability. Ideally, the drafting, QC, and validation stages should handle outputs wisely, yet in practice, the QC and validation stages cannot keep up, leading to compromised accuracy and quality [7], [8].

The historical chart data reveal fluctuations in amendments, peaking at 229 chart changes in one cycle, significantly exceeding anticipated workload capacity with only 12 active personnel. This overload leads to data inconsistencies and errors, a key factor in quality compromise, as confirmed through respondent insights reflecting the pressures to shorten verification steps and enforce shortcuts [9], [10], [11], [12], [13].

Delays in receiving raw data compound the problem, causing cascading delays in workflow and forcing personnel to operate reactively rather than proactively. The interconnected nature of chart drafting and publication tasks further complicates workflow, as chart data must be thoroughly validated and correlated before publication [14], [15], [16], [17], [18].

B. Optimal Timeframe for AIS Work Process

In response to observed limitations, a new timeframe recommendation is proposed, extending the work cycle to 42 working days (equivalent to 56 calendar days). This recommended timeframe, supported by expert input and questionnaire analysis, aims to optimize work duration and allocation per process stage to ensure both data accuracy and operational efficiency[3].

Table 3 Ideal Time Allocation Calculation with 100 Chart Output

Parameters	Drafting	Quality Control	Validation
Standard Process Time (Minutes)	839	341	1296
Number of Personnel (Publication and Cartography)	12	12	12
Effective Time per day (Minutes)	420	420	420
Daily Output	6	15	3.8
Process Time Allocation (Days)	18	6	10
Total Output 1 (One) AIRAC Cycle	100	100	100

The timeline recommendation is visually depicted in Figure 2 (b), illustrating a structured and comprehensive workflow in line with workload demands.

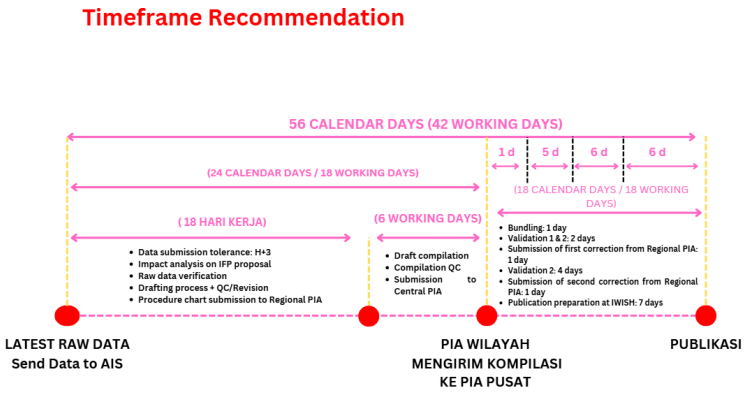

Figure 2 (b) Workflow Time AIS in SOP 001

CONCLUSION

From this research, it is evident that the current work procedure and timeframe are not optimal, significantly impacting the quality of aeronautical information publication. Personnel at the Aeronautical Information Center (PIA) require a more realistic and extended work timeframe to handle increased workload and ensure data accuracy under pressure. The current 28-calendar-day process is inadequate, leading to data inconsistencies. Therefore, this study proposes an optimal work timeframe of 42 working days (equivalent to 56 calendar days). Adoption of this timeframe into the Standard Operating Procedures (SOP) is recommended to improve efficiency and data quality.

Moreover, enhancing coordination mechanisms and data source units for timely raw data submission is crucial. Future research should explore digitalization and automation in validation processes to further improve efficiency.

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