DEVELOPMENT OF AVIATION TRAFFIC SERVICES WITH THE PROVISION OF RADIOS FOR SECONDARY FREQUENCY

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ABSTRAK

125,5 merupakan satu-satunya Frequency aktif yang digunakan oleh Tarakan Approach dalam pemberian pelayanan lalu lintas penerbangan, penelitian ini bertujuan untuk melihat keoptimalan pelayanan lalu lintas penerbangan yang ada di unit Tarakan Approach, sehingga dapat diperoleh dampak yang dapat terjadi dengan hanya menggunakan satu frequency saja. Metode penelitian yang digunakan adalah deskriptif kualitatif dengan membagikan kuesioner, dan melakukan observasi yang bertujuan untuk pengambilan data yang akan menjadi salah satu faktor penulis dalam mengambil keputusan di akhir penelitian ini. Berdasarkan data yang telah dikumpulkan, diketahui bahwa Tarakan Approach melayani lalu lintas penerbangan dengan kondisi traffic yang cukup padat dan kondisi radio yang sering mengalami gangguuan. Selain itu terdapat juga faktor-faktor lainnya yang dapat menyebabkan keoptimalan pelayanan lalu lintas penerbangan di Tarakan Approach terganggu seperti kondisi radio yang susah menggapai beberapa jalur dan tidak adanya radio back up jika radio primary mengalami jamming atau gangguan.
Kata Kunci: Radio, Frequency, Communication.

ABSTRACT

125.5 is the only active frequency used by the Tarakan Approach in providing air traffic services, this study aims to see the optimization of air traffic services in the Tarakan Approach unit, so that the impact that can occur by using only one frequency can be obtained. The research method used is descriptive qualitative by distributing questionnaires and conducting observations that aim to collect data which will be one of the authors' factors in making decisions at the end of this study. Based on the data that has been collected, it is known that the Tarakan Approach serves flight traffic with fairly congested traffic conditions and radio conditions that often experience interference. In addition, there are other factors that can cause the optimization of flight traffic services at Tarakan Approach to be disrupted, such as radio conditions that are difficult to reach several routes and the absence of radio back-up if the primary radio is jammed or interfered.
Keywords: *Radio, Frequency, Communication.*

INTRODUCTION

Indonesia is currently carrying out development in all fields such as political, social and economic. Therefore, this implementation must of course be supported by good mobility, one of which is in the field of transportation. The transportation sector in Indonesia has several options, namely land, sea and air transportation. However, of the several options, air transportation is the main choice because it has a high level of efficiency and can reach areas that are difficult to pass by land and sea transportation. So that in the field of aviation services are required to continue to make various improvements to improve quality in accordance with technological advances and current community needs.

Improving services in the world of aviation is absolutely necessary. This does not only lie in improving technology, but increasing human resources is also a must in the world of aviation. Especially in the field of Aviation Traffic guiding services, an expert and professional Air Traffic Controller (ATC) workforce is needed. Air Traffic Controller (ATC) is an officer who provides flight traffic regulation services, especially to prevent aircraft from getting too close to each other and prevent aircraft from colliding with each other. ATC is also in charge of regulating the smooth flow of traffic, providing important

information needed by pilots such as weather information, traffic information, navigation information, and assisting pilots in dealing with emergency situations, etc.

To produce reliable and professional human resources, Makassar Aviation Polytechnic organizes education and training in the field of aviation, while producing skilled, capable and expert human resources (HR), in accordance with applicable requirements. Related to the development of science and technology and the economy, regional communities currently need fast and safe transportation services to support their mobility from one place to another. Air transportation is the fastest, safest, most efficient and effective means of meeting the need for transportation compared to other means of transportation.

Flight traffic guidance services are one of the spearheads for airport managers. And for flight navigation services carried out by Perum LPPNPI Tarakan Branch. So everything in the form of direct services to users of air transportation services is tried as optimally as possible. And to optimize flight traffic guidance services must be supported by facilities, supporting infrastructure, professional human resources and a good work environment. But for flight traffic guides, creating optimal flight traffic guidance services is not easy because in the context of the word optimal for all traffic whether it is departure, arrival, overflying, or local flight.

Aviation traffic communication is a reciprocal relationship between aircraft and ATS units on the ground. In these conditions, the parties who need radio communication equipment directly are pilots, flight traffic guides, and flight technicians, for flight communication facilities as intended, one of which is Very High Frequency Air Ground Communication (VHF-A/G). Based on data on facilities and equipment in the MOS (Operations Manual) of Perum LPPNPI Tarakan Branch in 2018, the communication equipment in the Tarakan Approach unit is VHF A/G 125.5 MHz Telerad brand Rohde & Schawarz XU 251. One of the communication equipment is allocated for monitoring traffic on the Juwata Tower frequency.

During the author's OJT in the Tarakan Approach unit, the author experienced several obstacles in providing optimal flight traffic services, namely there were several problems at the Tarakan Approach frequency such as jamming, radio coverage that could not reach all Tarakan Approach airspace, especially below FL150 altitude, while in the Tarakan Approach unit there were no radio facilities for secondary frequencies that could back-up the primary radio in the Tarakan Approach unit. While the frequency 3 allocation for the secondary frequency is already available at 119.7 Mhz, which has been published in AlP and is found in the ATS Logbook in the facilities and Equipment checklist section.

Based on the things described above, the author tries to raise a writing related to the problem with the title; "DEVELOPMENT OF AIR TRAFFIC SERVICES BY PROVIDING RADIO FOR SECONDARY FREQUENCY".

METHODS

This research uses a qualitative descriptive approach with observation and interview/questionnaire methods to describe the condition of flight safety at Juwata Tarakan Airport. The author participated directly as On the Job Training (OJT) for more than five months, from September 9, 2020 to February 5, 2021, at the Approach Control Office unit of Perum LPPNPI Tarakan Branch. Data was collected through observation and online questionnaires distributed to ATC personnel, adjusting restrictions due to the COVID-19 pandemic. This study aims to find problems related to the absence of radios for secondary frequencies that interfere with the optimization of flight traffic services, with the data results becoming the basis for research decision making.

RESULT AND DISCUSSION

From the research that the author has done, the author obtained observation data including:

1) LNI673	: WAQQ – WALL	18) WON1455	: WAQM – WAQQ
2) LNI674	: WALL – WAQQ	19) SJY130	: WALL – WAQQ
3) LNI675	: WAQQ – WALL	20) SJY131	: WAQQ – WALL
4) LNI768	: WALL – WAQQ	21) LNI 934	: WALL - WAQT
5) LNI738	: WAAA – WAQQ	22) LNI 935	: WAQT - WALL
6) LNI739	: WAQQ – WAAA	23) WON1361	: WALL - WAQT
7) LNI268	: WARR – WAQQ	24) WON1360	: WAQT - WALL
8) LNI267	: WAQQ – WARR	25) GIA 467	: WALL - WAQT
9) LNI626	: WIII – WAQQ	26) GIA 466	: WAQT – WALL
10) LNI627	: WAQQ – WIII	27) SJY 230	: WALL – WAQT
11) LNI3934	: WALL – WAQT	28) SJY 231	: WAQT –WALL
12) LNI3935	: WAQT – WALL	29) WON1358	: WALL – WAQD
13) BTK7271	: WALL – WAQQ	30) WON1359	: WAQD – WAQD
14) BTK7270	: WAQQ – WALL	31) WON1477	: WAQM – WALL
15) GIA464	: WALL – WAQQ	32) WON1478	: WALL - WAQM
16) GIA465	: WAQQ – WALL	33) BTK6430	: WIII – WAQT
17) WON1454	: WAQQ – WAQM	34) BTK6431	: WAQT – WIII

Tabel 1 Flight Schedule Line W18

From the flight schedule, below is the total overall aircraft traffic movement served by Perum LPPNPI Tarakan Branch in 2020.

MONTHS	DEP	ARR	OVF	TOTAL	AVERAGE DEP PER MONTH	AVERAGE ARR PER MONTH	AVERAGE OVF PER MONTH
JAN	473	477	726	1.676	15	15	23
FEB	492	496	709	1.697	17	17	24
MAR	433	438	742	1.613	14	14	24
APR	203	220	154	577	7	7	5
MAY	211	209	58	478	7	7	2
JUN	266	264	231	761	9	9	8
JUL	382	395	408	1.185	12	13	13
AUG	313	327	412	1.052	10	11	13
SEP	340	345	361	1.046	11	12	12
OCT	346	361	352	1.059	11	12	11
NOV	422	440	403	1.265	14	15	13

DEC	469	484	446	1.399	15	16	14
Total	**4.350**	**4.456**	**5.002**	**13.808**			
Average	**363**	**371**	**417**	**1.151**			

Tabel 2 *Traffic data in 2020 (Source: Perum LPPNPI Tarakan Branch Data)*

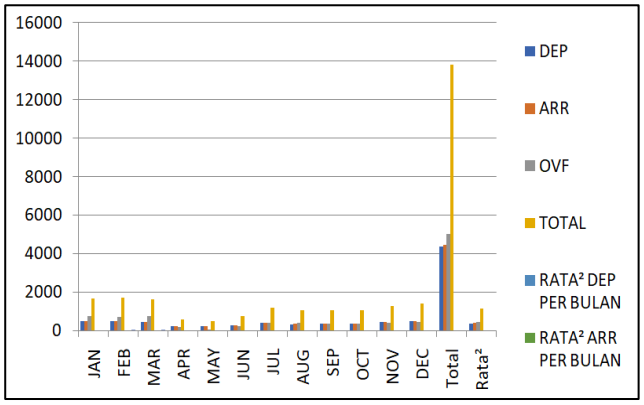

Figure 1 Overall traffic data (Source: Perum LPPNPI Tarakan Branch Data)

After obtaining data on traffic movements served by Tarakan Approach as a whole, the authors then gave questionnaires to air traffic control personnel at the Tarakan Approach unit, totaling 10 people for comparison of traffic density levels before and after entering the Covid-19 Pandemic period.

These factors are supported by the results of the author's observations obtained during On the Job Training at the Tarakan Approach unit, which are described as follows:

1. *Log Book* perum LPPNPI Tarakan branch dated 19/10/2020

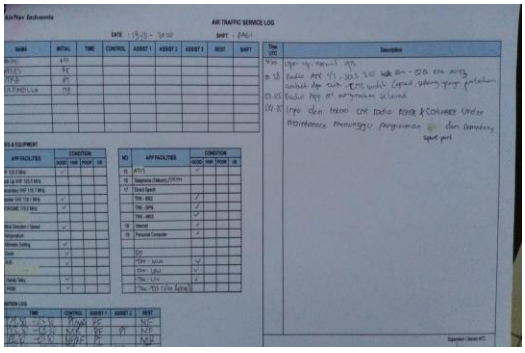

Figure 2 Log Book perum LPPNPI Tarakan branch on 19/10/2020

At the time of open duty at 21.30 UTC all facilities/equipment in the Tarakan Approach unit were in good or serviceable condition, as can be seen from Figure 4.4 APP FACILITIES section. All traffic was running normally until 00.38 UTC SQS310 QM-QQ aircraft with ETA 00.43 contact TWR which at that time the aircraft should have reported passing 030 'first to APP. Finally, after being confirmed, it turned out that the radio in the Tarakan Approach unit was experiencing interference, unable to transfer information or receive it.

2. *Log Book* perum LPPNPI Tarakan branch on 03/01/2021 and 11/01/2021

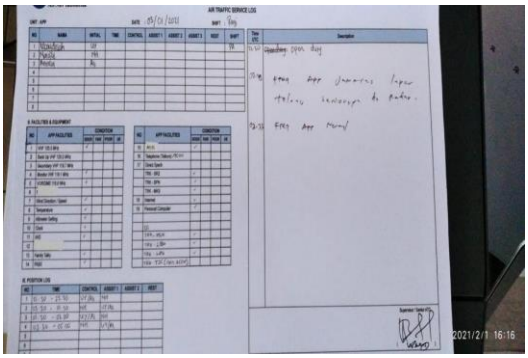

Figure 2. *Log Book for LPPNPI Tarakan branch on 03/01/2021*

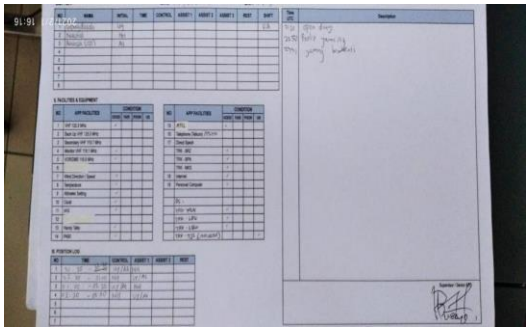

Figure 3. *Log Book for LPPNPI Tarakan branch on 11/01/2021*

The next event was on January 03 and 11, 2021, the radio in the Tarakan Approach unit experienced a very long jamming, and therefore the personnel in the Tarakan Approach unit received more workload because they had difficulty transferring information and vice versa. With such circumstances it is likely to cause BOS (breakdown of separation) and it is not safety and efficient in flight traffic services.

3. Hazard data in 2020

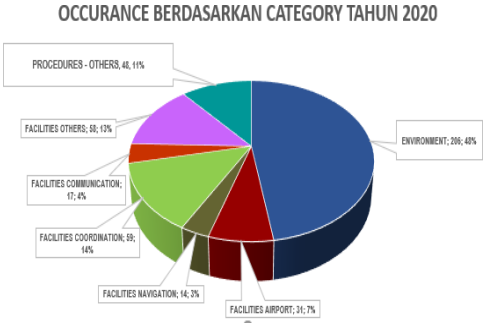

Figure 4. 2020 Hazard / Occurance Data

In 2020 damage to communication facilities in the Tarakan APP unit that fell into the hazard category was 4% or as many as 17 events, this data is outside the radio's habit of experiencing noise or missing sounds that can occur at least 3 times a week. The large percentage is one of the reasons the author took this research.

From the results of collecting traffic data and questionnaires that the authors have obtained which are then processed to analyze the problem, there are factors that cause flight traffic services in the Tarakan Approach unit to not be fully optimal, namely as follows:

1. Facility feasibility
   The feasibility of facilities in the Tarakan Approach unit cannot all be said to be feasible, why? One reason is the age factor, many of the facilities in the Tarakan Approach unit are quite old. The facilities there can be said to be quite old can be seen from the model of the tools and facilities, and can also be seen from when the procurement of these facilities can be seen in the data of facilities and tools in Perum LPPNPI Tarakan. This causes navigation services and flight traffic in Tarakan Approach not optimal and efficient. Not optimal and efficient navigation and aviation traffic services are caused by facilities that often experience interference, for example, Direct Speech which sometimes cannot receive calls and vice versa, radios that often experience jamming, AWOS which are sometimes unserviceable and many more.
2. Awareness Level
   The level of awareness is also a factor why facilities and tools in the Tarakan Approach unit and Perum LPPNPI Tarakan. A low level of awareness causes existing tools, facilities and documents to be damaged. During the author's on the job training, the author saw that there were several tools that would be checked if they experienced damage or interference instead of periodic checks. Periodic checking of existing tools and facilities can reduce the risk of damage.

CONCLUSIONS

During the research in the Tarakan Approach Unit, the provision of flight traffic guidance services has been running well, but not optimal, because the author found several problems that can interfere with the smooth running of flight traffic. The problem faced is the unavailability of secondary frequency radio facilities to back-up primary radio, while the frequency allocation for secondary frequency is already available at 119.7 Mhz. If the radio frequency Tarakan Approach experiences disturbances such as jamming / block frequency, it can cause disruption in the provision of flight traffic guidance services because radio communication between pilots and flight traffic guides becomes obstructed, if this happens during heavy traffic or during traffic conflicts, this can lead to the occurrence of BOS (Breakdown of separation).

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