International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

Vol. 33 No. 1 June 2022, pp. 676-681

# *Helicopter Circuit Pattern Design At Perum LPPNPI Sorong Branch*

Dandy March Chanafiah [1], Nunuk Praptiningsih [2], Rany Adiliawijaya Putriekapuja[3], Togi Adnan Maruli Sinaga[4]

Politeknik Penerbangan Indonesia Curug, Tangerang, Banten, Indonesia



**Abstract – The design of the helicopter circuit pattern with smooth air traffic service at the ADC Tower unit at Domine Edward Osok Airport is what made the author interested in conducting research. The circuit pattern at Domine Edward Osok Airport that did not meet the standards resulted in obstacles and disturbances to ADC tower officers in providing flight traffic services, especially for aircraft in the vicinity aerodrome. The problem that occurred certainly interfered with the comfort of ADC Tower officers in providing flight traffic services, so that the provision of air traffic services could not run smoothly and efficiently. With the helicopter circuit pattern design accompanied by close coordination between the ADC Tower Unit and the Approach Control Office Unit, it is hoped that it can reduce problems that occur and can minimize aircraft delays, especially during peak hours**

**Keywords – Tower, circuit pattern, ADC, Helicopter.**

## I. INTRODUCTION

Indonesia is a developing country, which currently has many islands and mountains such as in Papua needs a safe and convenient mode of transportation such as air transportation. The territorial area of West Papua is a hilly area. Barisan Hill. These geographical conditions are unfavorable for land and sea transport. Air transport became the solution to this geographical problem. Air transportation, especially the Aviation Industry, is required to provide excellent and timely service because the public's interest in aviation services every year experiences developments so that the smoothness, regularity and safety of aviation are the top priorities of aviation service providers.

Domine Eduard Osok Airport (ICAO code: WASS) abbreviated as DEO is an airport that serves flights to and from the city of Sorong, West Papua province, Indonesia. Domine Eduard Airport Domine Eduard Osok Airport runs domestic flights and has one runway with 60 operating areas, with operating hours of 04.00-20.00 WIT. The aircraft in operation consist of civil aircraft and rotary wings aircraft. The air space of Domine Eduard Osok Airport has had an Ats Route in the form of SID / STAR to be able to accommodate existing flights [1], [2] [3]–[10]. This aviation service is able to improve the surrounding economy [11]–[16] [17]–[20].

However, there is a roraty wings aircraft procedure that is not yet available, namely the Circuit Pattern specifically for rotary wings aircraft.with the absence of a Circuit Pattern for rotary wings flights, in providing services soaring atc adapts the movement of IFR so that there are no special provisions or Circuit Pattern used for rotary wings [14][21]–[24].

Thus, when the rotary wings flight follows the direct flight, the IFR division does not follow the specified SID so that it must be given in accordance with the rotary wings.

**Corresponding Author:** Nunuk Praptiningsih

## II. RESEARCH METHODS

The research method that will be used in this research is Research and development. To obtain a draft that complies with the standard document specified by ICAO.

### Data Collection Methods

In this study, several data collection techniques were used in collecting the necessary data, namely. The data sources used are Annexes, documents, laws, regulations, and other written sources. The author uses several data collection techniques in collecting the necessary data, namely Literature Study, Documentation, and Interviews [25]–[30].

The problem analysis method in this study is based on a process that occurs today, namely the operator of the Aviation Traffic Service. The creation of VFR routes, especially helicopters used both by VFR aircraft in flight operations and by Air Traffic Controllers in providing their services.

If data collection uses observation, explain the methods used, for example direct observation as an insider or outsider, obsevation with tools (instrumented observation), behavioral mapping or track-record (tracking) and others.

### Data Analysis Methods

After collecting the required data, the author then analyzes the existing data so that it can be presented properly. In this study, the author used the Miles and Huberman model data analysis technique in Sugiyono [31], which consisted of the following stages:

#### 1. Data Reduction

After collecting the available data from various sources (field notes, official documents, pictures, photos, and so on) through the results of interviews and documentation, then the data obtained from the field, which is quite a lot, needs to be recorded and researched. Reducing data means summarizing, choosing the main things, focusing on the important things, and looking for themes and patterns. Thus the data that has been reduced will provide a clearer picture and make it easier for the author [32], [33].

#### 2. Data Presentation

After the data is reduced, then the next step is to present the data. Data presentation can be done in the form of brief descriptions, charts, relationships between categories, flowcharts, and so on.

#### 3. Verification

Verification is carried out by the author to find out the correctness of the design that has been made by the author according to experts in each field predetermined. Thus, the design made can be tested.

#### 4. Using Reference Materials

In addition to the three data analysis techniques, the author also uses reference material as a support to prove the data that has been found by the author. The data used is in the form of documents to support research.Expected Approach Time

## III. RESEARCH RESULTS

Based on the data that the author got from the study of literature, documentation and interviews listed in the appendix, the author tried to find similarities, views, thoughts, opinions but did not eliminate different opinions. In this study, it is known that there is no Helicopter Circuit pattern. The existence of a Helicopter Circuit pattern can improve safety, efficiency and can also help the work of ATC at Domine Eduard Osok Airport [34] [35]–[38]

#### 1. Point helicopter

a. Point alpha : Vacant Land ( North)

   Coordinates: 0*52'23'S 131*17'18'E

b. Point bravo: Pier (South)

Coordinates: 0*54'37'S 131*17'26'E

**2. Procedure**

**Departure**

a. Helicopter taxi permission is granted by DEO Tower, and taxis to the runway to do a takeoff.

b. Helicopters flying to the North and East directions go directly to point alpha (vacant land)0*52"23"S 131"17"18"E

c. Helicopters flying to the south and west directions directly to the point bravo (Pier)0*54'37'S 131*17'26'E

**Arrival**

a. By the time the helicopter was approaching with the point, the pilot reported to the ATC and when he had climbed the point with the rant of the helicopter was already at 1000ft with Hovering waiting for ATC instructions.

b. If you use runway 09, the helicopter comes from the north and east to point alpha and is already at an altitude of 1000ft, then the helicopter goes towards downwind runway 09 and follows the circuit pattern that has been designed.

c. If using runway 09 the helicopter coming from the south and west towards point alpha and is already at an altitude of 1000ft, then the helicopter goes towards the right downwind runway 09 and follows the circuit pattern that has been designed.

d. If using runway 27 helicopters come from the north and east to point alpha and are already at an altitude of 1000ft, then the helicopter goes towards the right downwind runway 27 and follows the circuit pattern that has been designed

e. If you use runway 27 helicopters coming from the south and west to point alpha and the vehicle is at an altitude of 1000ft, then the helicopter goes towards downwind runway 27 and follows the circuit pattern that has been designed.

f. Then after landing the helicopter was given taxi clearance by ATC.

Figure 1. Location of Point Alpha and Bravo

The distance of 1.5nm from the aiming point is still being monitored from the Tower

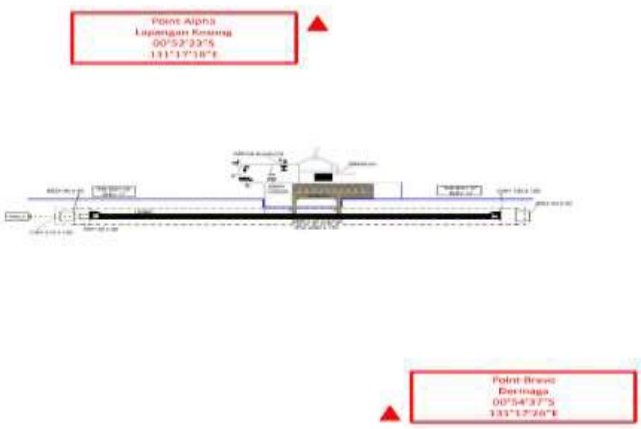

Figure 2. Layout and *Refrence Point*

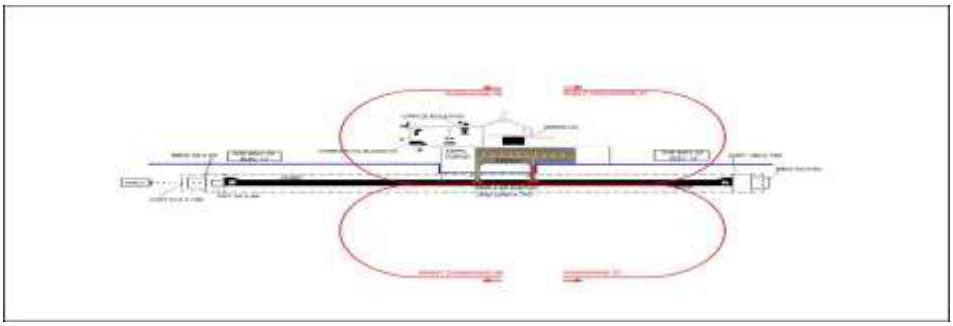

Figure 3. Helicopter Circuit Pattern Design

With IAP, flight safety and efficiency at Domine Eduard Osok Airport are less than optimal with the absence of separate ROUTES IFR and VFR, especially helicopters, for example, VFR flights that do not have their own procedures. In the creation of the Helicopter Circuit Pattern design, the stages carried out by the author refer to ICAO, Document ICAO 8168 / Aircraft Operation, 5.4.4, OCA / H Construction Of Visual And Instrument Flight Procedures as manufacturing guidelines. Helicopter Circuit Pattern.

With the Circuit Pattern design, this helicopter can be applied to improve safety and efficiency at Domine Eduard Osok Airport. The Helicopter Circuit Pattern design needed to facilitate ATC in providing air traffic guidance services other than ATS routes such as Standard Instrument Departure (SID) and Standard Instrument Arrival (STAR) is the VFR Corridor for VFR flights, especially helicopters.

## IV. CONCLUSION

ATC, which is in charge of providing traffic guidance services at the LPPNPI perum, Sorong branch, is for the position of the Rotary Wings Aircraft. The absence of the same visual provisions for VFR flights from pioneer airport to Domine Eduard Osok Airport, makes it difficult for ATC, which is in charge of providing traffic guidance services at perum LPPNPI Sorong Branch, difficult to determine the position of the VFR aircraft. The Helicopter Circuit Pattern design needed to facilitate ATC in providing air traffic guidance services other than ATS routes such as Standard Instrument Departure (SID) and Standard Instrument Arrival (STAR) is the VFR Corridor for VFR flights, especially helicopters.

## V. CONFLICT OF INTEREST

All authors declare no conflicts of interest.

## VI. AUTHORS CONTRIBUTION

Authors have equally participated and shared every item of the work.

## REFERENCES


[1] D. Jatmoko, P. Asih, M. F. Muzaki, P. Penerbangan, I. Curug, dan A. C. Tower, "Pelaksanaan Praktikum Aerodrome Control Tower di Politeknik Penerbangan Indonesia Curug," *Langit Biru J. Ilm. Aviasi*, vol. 14, no. 2, hal. 51–57, 2021.

[2] C. Bellini *et al.*, "Long-Distance, Nonstop Neonatal Transport From Shanghai, China, to Genoa, Italy," *Air Med. J.*, vol. 37, no. 1, hal. 67–70, Jan 2018.

[3] Presiden Republik Indonesia, *Undang-Undang Republik Indonesia Nomor 1 Tahun 2009 tentang Penerbangan*. 2009.

[4] Direktorat Jenderal Perhubungan Udara, *SKEP/ 140/ VI/ 1999 Tentang Persyaratan Dan Prosedur Pengoperasian Kendaraan Di Sisi Udara*, no. April. 2016.

[5] Direktorat Jenderal Perhubungan Udara, *KP 14 Tahun 2015 Standar Teknis dan Operasi Peraturan Keselamatan Penerbangan Sipil Bagian 139 (Manual of Standard CASR Part 139) Volume IV Pelayanan Pertolongan Kecelakaan Penerbangan dan Pemadam Kebakaran (PKP-PK)*. 2015.

[6] Presiden Republik Indonesia, *Peraturan Pemerintah Republik Indonesia Nomor 70 Tahun 2021 tentang Kebandarudaraan*. 2001.

[7] K. K. R. I. Kemenkeu, *Peraturan Menteri Keuangan Republik Indonesia Nomor 176/PMK.05/2017 Tentang Pedoman Remunerasi Badan Layanan Umum*. 2017.

[8] Menteri Perhubungan Republik Indonesia, *Peraturan Menteri Perhubungan Republik Indonesia No 127 Tahun 2015 Tentang Program Keamanan Penerbangan Nasional*. 2015.

[9] K. P. R. Indonesia, *Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 81 Tahun 2021 tentang Kegiatan Pengusahaan di Bandar Udara*. 2021.

[10] K. P. R. Indonesia, *Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 39 Tahun 2019*. 2019.

[11] S. Sihono, A. Fatkulloh, R. Saputro, D. Herwanto, N. Kalbuana, dan B. Kurnianto, "Pemantapan Dan Refreshing Materi Electrical & Electronik Untuk Guru Smk Penerbangan Di Jawa Tengah Dan Sekitarnya," *Jubaedah J. Pengabdi. dan Edukasi Sekol. (Indonesian J. Community Serv. Sch. Educ.*, vol. 1, no. 1, hal. 12–19, 2021.

[12] Y. Arnas, K. G. S. M. Ismail, Z. Kurniawati, B. Kurnianto, I. H. Wibowo, dan N. Kalbuana, "Pelatihan perawatan / service AC untuk masyarakat sekitar Politeknik Penerbangan Indonesia Curug," *Penamas J. Community Serv.*, vol. 1, no. 2, hal. 90–99, 2021.

[13] N. Kalbuana, B. Kurnianto, A. Abdusshomad, dan C. Indra Cahyadi, "Peningkatan Kemampuan Personil Penerbangan Pada Pelayanan Jasa Kebandarudaraan Melalui Pendidikan Dan Pelatihan Manajemen Bandar Udara," *Pengmasku*, vol. 2, no. 1, hal. 57–65, Jun 2022.

[14] D. Jatmoko *et al.*, "Pengenalan Pemanduan Lalu Lintas Penerbangan (Air Traffic Control) Di Indonesia," *Pengmasku*, vol. 2, no. 1, hal. 21–28, Jan 2022.

[15] O. Hendra, P. R. Aswia, D. Lestary, Kardi, Solihin, dan N. Kalbuana, "Pengenalan Unit Penanggulangan Keadaan Darurat Di Bandara Bagi Siswa SMK Penerbangan di Wilayah Lampung dan Sidoarjo," *Jubaedah J. Pengabdi. dan Edukasi Sekol.*, vol. 1, no. 3, hal. 232–239, 2021.

[16] B. Prasetyo, T. Rohman, S. Solihin, S. Sundoro, dan N. Kalbuana, "Sosialisasi Kawasan Keselamatan Operasi Penerbangan (KKOP)," *J. Pengabdi. Kpd. Masy. Langit Biru*, vol. 2, no. 1, hal. 31–38, Mar 2021.

[17] N. Praptiningsih *et al.*, "Factors Affecting The Interest In Using E-Wallet Among Indonesian Millenials," *Acad. Entrep. J.*, vol. 27, no. 5, hal. 1–10, 2021.

[18] A. Wahyudin, M. P. Sari, A. Ardiansari, S. Raharja, dan N. Kalbuana, "Instrument Design Of Small Industry Performance Measurement In Semarang City With Balanced Scorecard Concept," *Acad. Account. Financ. Stud. J.*, vol. 25, no. 3, hal. 1–9, 2021.

[19] M. Indrawati, W. Utari, I. Prasetyo, Rusdiyanto, dan N. Kalbuana, "Household business strategy during the covid 19 pandemic," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. Spesial Issue 1, hal. 1–12, 2021.

[20] S. L. Simbolon, N. Kalbuana, P. Asih, Solihin, dan Z. Kurniawati, "Impact of Covid-19 Vaccination on Airline Business in Indonesia," *Acad. Account. Financ. Stud. J.*, vol. 25, no. 3, hal. 1–10, 2021.

[21] H. D. Nurcahya, K. G. S. M. Ismail, B. Kurnianto, dan S. Lamtiar, "Water Detection Sensor for Generator Set ' s Fuel Tank," *Int. J. Progress. Sci. Technol.*, vol. 30, no. 2, hal. 434–443, 2022.

[22] N. Praptiningsih, J. E. Sitompul, dan N. D. G. Fransiska, "Helicopter Entry Point Design At LPNPI Pontianak Branch Office," *Int. J. Progress. Sci. Technol.*, vol. 27, no. 2, hal. 667–672, 2021.

[23] F. M. Haris, L. Rosmayanti, W. Darjono, D. A. Purwaningtyas, dan E. S. Arti, "EAST VFR Route Design at Airnav Indonesia Banjarmasin Branch Office," *Int. J. Progress. Sci. Technol.*, vol. 30, no. 1, hal. 557–566, 2021.

[24] S. Lamtiar, N. Desriyanto, Robiansyah, dan N. Kalbuana, "Making Modeling Control System Of The Use Of Electrical Energy In A Flight Engineering Department Building Stpi Curug-Tangerang," *Int. J. Progress. Sci. Technol.*, vol. 23, no. 2, hal. 523–532, 2020.

[25] W. Hastomo, A. S. B. Karno, N. Kalbuana, A. Meiriki, dan Sutarno, "Characteristic Parameters of Epoch Deep Learning to Predict Covid-19 Data in Indonesia," *J. Phys. Conf. Ser.*, vol. 1933, no. 1, hal. 12050, Jun 2021.

[26] A. Luwihono *et al.*, "Macroeconomic effect on stock price: Evidence from Indonesia," *Accounting*, vol. 7, no. 5, hal. 1189–1202, 2021.

[27] N. Kalbuana *et al.*, "Earnings Management Is Affected By Firm Size, Leverage And Roa: Evidence From Indonesia," *Acad. Strateg. Manag. J.*, vol. 20, no. SpecialIssue2, hal. 1–12, 2021.

[28] M. Jannah *et al.*, "Effect of ISO 9001, ISO 45001 and ISO 14000 toward financial performance of Indonesian manufacturing," *Syst. Rev. Pharm.*, vol. 11, no. 10, hal. 894–902, 2020.

[29] J. E. Prasetio *et al.*, "Corporate Social Responsibility Community Development And Empowerment Program In Indonesia," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. S1, hal. 1–10, 2021.

[30] I. Prasetyo, N. Aliyyah, Rusdiyanto, N. Kalbuana, dan A. S. Rochman, "Corporate Social Responsibility Practices in Islamic Studies in Indonesian," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Issue 1, hal. 1–15, 2021.

[31] P. D. Sugiyono, *Sugiyono, P. D. (2017). Metode penelitian bisnis: pendekatan kuantitatif, kualitatif, kombinasi, dan R&D*. Bandung, 225: Penerbit CV. Alfabeta, 2017.

[32] A. Budi Pradana, *Metode Penelitian Ilmiah*. Tangerang, 2019.

[33] E. P. Widyoko, *Teknik Penyusunan Instrumen Penelitian*. Yogyakarta: Pustaka Pelajar, Cet, 2018.

[34] Kementerian Perhubungan Republik Indonesia, *Civil Aviation Safety Regulation Part 91, General Operating and Flight Rules*. 2015.

[35] International Civil Aviation Organization, *Annex 11, Air Traffic Services, 13th Edition*,. 2001.

[36] International Civil Aviation Organization, *Doc. 4444, Air Traffic Management, 16th Edition*. 2016.

[37] International Civil Aviation Organization, *Doc. 9426-AN/924, Air Traffic Services Planning Manual, First (Provisional) Edition.* 1984.

[38] International Civil Aviation Organization, *Doc. 8168-OPS/611, Aircraft Operation Volume II, 6th Edition*. 2014.