KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA

PRELIMINARY

KNKT.22.12.18.04

Aircraft Accident Investigation Report

PT Carpediem Aviasi Mandiri

Bell 206 B3; PK-CDO

Mining 1, Kawe, Papua

Republic of Indonesia

5 December 2022

2022

This Preliminary Report is published by the Komite Nasional Keselamatan Transportasi (KNKT), Transportation Building, 3rd Floor, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, Indonesia.

The report is based upon the investigation carried out by the KNKT in accordance with Annex 13 to the Convention on International Civil Aviation, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

The preliminary report consists of factual information collected until the preliminary report published. This report will not include analysis and conclusion.

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Jakarta, 27 December 2022
KOMITE NASIONAL
KESELAMATAN TRANSPORTASI
CHAIRMAN

SOERJANTO TJAHJONO

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ABBREVIATIONS AND DEFINITIONS

AOC	:	Air Operator Certificate
ATC	:	Air Traffic Controller
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CASR	:	Civil Aviation Safety Regulation
CPL	:	Commercial Pilot License
DAAO	:	Directorate of Airworthiness and Aircraft Operation
DGCA	:	Directorate General of Civil Aviation
FOO	:	Flight Operation Officer
GPS	:	Global Positioning System
HIRA	:	Hazard Identification and Risk Assessment
HLO	:	Helicopter Landing Officer
KNKT	:	*Komite Nasional Keselamatan Transportasi* (is the Indonesia Independent Investigation Authority also known as National Transportation Safety Committee/NTSC)
LT	:	Local Time
OM	:	Operation Manual
PIC	:	Pilot in Command
SMSM	:	Safety Management System Manual
UTC	:	Universal Time Coordinated
VFR	:	Visual Flight Rules
VHF	:	Very High Frequency

SYNOPSIS

On 5 December 2022, a Bell 206 B3 helicopter with registration PK-CDO was being operated by PT Carpediem Aviasi Mandiri (Carpediem Air) on unscheduled cargo flights from Iwot Helipad, Tanah Merah to several landing spots at Kampung Kawe area. On board the helicopter was one pilot and one Helicopter Landing Officer (HLO).

At 0418 UTC (1318 LT), on daylight condition, the helicopter departed from Iwot Helipad and performed nine landings at Kawe area. The landings and cargo unloading process were uneventful. At 1434 LT, the helicopter conducted subsequent flight from Kawe Helipad to Mining 1 (M1). The cargo on board the helicopter stored in the cargo and passenger compartment. This flight was the first flight for the pilot to M1 on that day.

At 1442 LT, the helicopter landed at unpaved road which connected the houses on the settlement area at M1. Considering that the cargo unloading process would not take more than five minutes, the pilot did not shut down the engine and waited inside the helicopter while the rotor blades were still running. The same method was also conducted during the previous nine flights.

The HLO observed that there were no people near the helicopter except the customer who went to the left side of the helicopter to meet the HLO. When unloaded the cargo, the HLO heard a loud sound came from the rear section of the helicopter. The HLO looked to the source of the sound and saw a person has laid on the ground. About the same time, the HLO noticed that the customer ran away from the helicopter followed by several people who stood in front of the helicopter. The HLO thought that a danger situation was happening as several people ran away from the helicopter. Thereafter, the HLO went to the helicopter and advised the pilot to take off immediately. The pilot who also aware of several people ran away from the helicopter decided to take off as he assumed that there was security issue. The pilot then decided to return to Iwot Helipad as there was no other abnormal indication of the helicopter system.

At 1458 LT, the helicopter landed at Iwot Helipad, the pilot shut down the engine. After the tail rotor stopped rotating, the pilot and HLO checked the tail rotor condition and found damage on the tail rotor. Thereafter, they received information that the person who laid on the ground was a local resident who approached the helicopter with intention to ask to get onboard. The local resident impacted the tail rotor blades and fatally injured.

At the time of issuing this investigation report, the KNKT had been informed of safety actions resulting from this occurrence taken by the helicopter operator. However there still safety issues remain to be considered, therefore, the KNKT issued safety recommendations to the helicopter operator.

The investigation is continuing, should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 5 December 2022, a Bell 206 B3 helicopter with registration PK-CDO was being operated by PT Carpediem Aviasi Mandiri (Carpediem Air) on unscheduled cargo flights from Iwot Helipad, Tanah Merah[1] to several landing spots at Kampung Kawe area[2]. The flights were conducted in a single pilot operation and in accordance with Visual Flight Rules (VFR). Considered that several landing spots were unprepared helipad in remote area, the company assigned one Helicopter Landing Officer (HLO) on board the helicopter.

At 0418 UTC (1318 LT[3]), on daylight condition, the helicopter departed from Iwot Helipad and performed nine landings at Kawe area. The landings and cargo unloading process were uneventful. At 1434 LT, the helicopter conducted subsequent flight from Kawe Helipad to Mining 1 (M1)[4]. The cargo on board the helicopter stored in the cargo and passenger compartment. This flight was the first flight for the pilot to M1 on that day.

Prior to land at M1, the pilot performed reconnaissance procedure to observe the landing spot. At 1442 LT, after ensuring the area was clear from obstacle the helicopter landed at M1. The helicopter landed at unpaved road which connected the houses on the settlement area at M1. The HLO disembarked the helicopter, and after checked that helicopter was landed properly, the HLO gave a hand signal to the pilot to inform that the landing was good. The HLO also gave hand signal to the customer who was waiting near the landing spot to inform that the unloading cargo process would be initiated.

Considering that the cargo unloading process would not take more than five minutes, the pilot did not shut down the engine and waited inside the helicopter while the rotor blades were still running. The same method was also conducted during the previous nine flights.

The HLO observed that there were no people near the helicopter except the customer who went to the left side of the helicopter to meet the HLO. The HLO then advised the customer to stand on his left side while the HLO unloaded the cargo (see figure 1). The pilot who waited inside the aircraft observed several local residents stood about 40 meters in front of the helicopter, watching the unloading process.

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1 Iwot Helipad located about 2 Nm on bearing 014° from Boven Digoel Aiport (WAKT), Tanah Merah on coordinate 06°04’21”S 140°18’22”E.

2 Kawe located about 55 Nm from Iwot Helipad on bearing 359° from Iwot Helipad on coordinate 5°8'18.00"S 140°17'48.00"E. At Kawe area, there were several helipads for helicopter.

3 The 24-hours clock in Local Time (LT) is used in this report to describe the local time as specific events occurred. Universal Time Coordinated (UTC) is UTC+9 hours.

4 Mining 1 located about 12 Nm on bearing 312° from Kawe Helipad on coordinate 5°0'30.27"S 140°9'5.04"E.

Figure 1: The illustration of the accident site (annotated by KNKT)

When unloaded the cargo, the HLO heard a loud sound came from the rear section of the helicopter. The HLO looked to the source of the sound and saw a person has laid on the ground. About the same time, the HLO noticed that the customer ran away from the helicopter followed by several people who stood in front of the helicopter. The HLO thought that a danger situation was happening as several people ran away from the helicopter. Thereafter, the HLO went to the helicopter and advised the pilot to take off immediately. The pilot who also aware of several people ran away from the helicopter decided to take off as he assumed that there was security issue.

During the takeoff, the pilot noticed that the BAGGAGE DOOR caution light illuminated as the HLO has not closed the baggage door. Afterward, the HLO advised the pilot that he saw a person laid on the ground and concerned about their security. The pilot then decided to return to Iwot Helipad as there was no other abnormal indication of the helicopter system.

At 1458 LT, the helicopter landed at Iwot Helipad, the pilot shut down the engine. After the tail rotor stopped rotating, the pilot and HLO checked the tail rotor condition and found damage on the tail rotor. Thereafter, they received information that the person who laid on the ground was a local resident who approached the helicopter with intention to ask to get onboard. The local resident impacted the tail rotor blades and fatally injured.

1.2 Injuries to Persons

One local resident was fatally injured as a result of this occurrence.

1.3 Damage to Aircraft

The helicopter was substantially damaged. The damaged of the helicopter limited on the tail rotor blades.

1.4 Other Damage

There was no other damage to property and/or the environment.

1.5 Pilot Information

1.5.1 Pilot In Command

The pilot is Indonesia nationality who held valid Commercial Pilot License (CPL) and qualified as Bell 206 B3 helicopter pilot. The pilot also held valid Class 1 medical certificate without medical limitation. The last proficiency check for the pilot was conducted on 13 December 2021, the result was satisfactory.

The pilot had total flying hour of 1,084 hours 20 minutes, included 1,023 hours 5 minutes on Bell 206 B3 helicopter. Prior to the occurrence, the pilot had flown about 2 hours with total of nine landings at Kawe Area.

The total hour of Papua area flight operation was about 500 hours. All Papua flights were performed since the pilot joined the Carpediem Aviasi Mandiri in 2020. The pilot had encountered several securities issues during flight operation at Papua area, included local resident who forced to get onboard the helicopter.

1.5.2 Helicopter Landing Officer (HLO)

The HLO is Indonesia nationality who had in total experience of 7 years as HLO, and all of his working experience was at Papua area. The HLO held a HLO license that has been due at the day of the accident.

During the accident, the HLO did not aware of the local resident movement near the tail rotor as he performed the cargo unloading task.

Similar with the pilot, the HLO also had encountered several securities issues during flight operation at Papua area, included local resident who forced to get on board the helicopter.

1.6 Aircraft Information

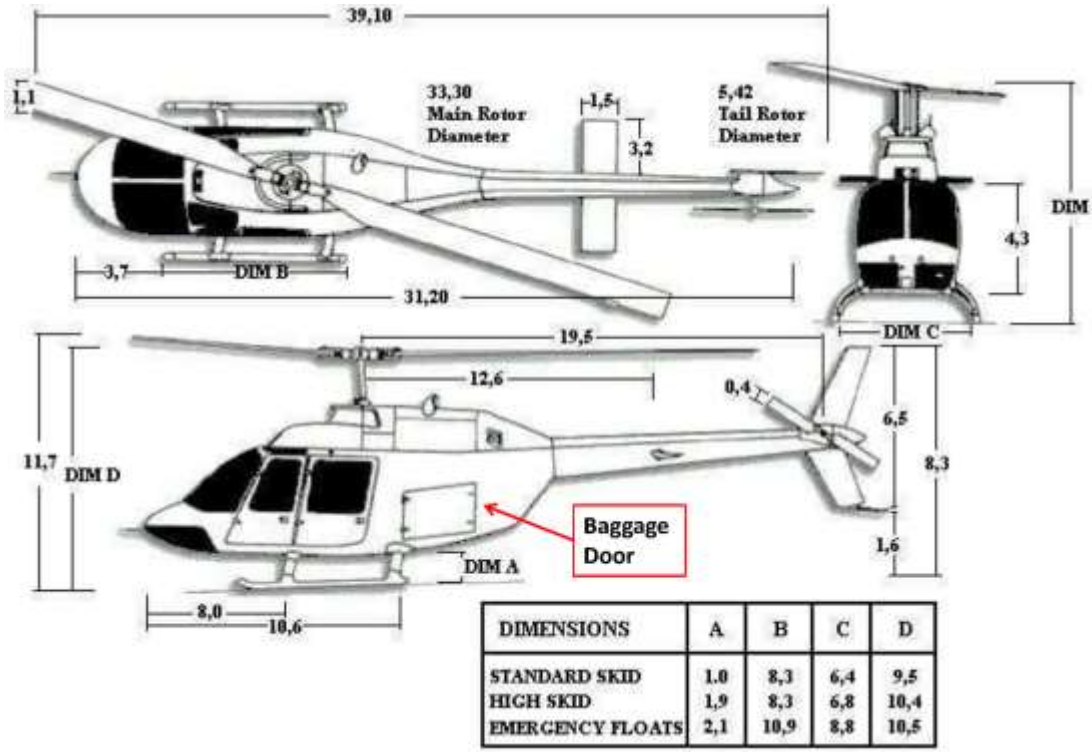
The Bell 206 B3 Helicopter with serial number of 4539, was manufactured by Bell Helicopter Textron, in 2000. The aircraft registered PK-CDO and had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

Prior to the departure, there was no record or report of helicopter system malfunction.

The aircraft had total hour since new of 3207.6 hours, and the total cycles since new of 4,717 cycles. The engines installed on the helicopter was M250-C20J type manufactured by Rolls Royce.

The helicopter had two blades of tail rotor manufactured by Bell Helicopter Textron with part number 206-016-201-137.

The following was the helicopter dimension taken from the Carpediem Operation Manual (OM) Part B.



DIMENSIONS	A	B	C	D
STANDARD SKID	1.0	8,3	6,4	9,5
HIGH SKID	1,9	8,3	6,8	10,4
EMERGENCY FLOATS	2,1	10,9	8,8	10,5

Figure 2: Helicopter dimension and baggage door location (annotate by KNKT)

1.7 Meteorological Information

Meteorological observation service was not provided in the M1 landing spot. According to the pilot and HLO recollection, the weather, including visibility during the accident was good and met the VFR criteria.

1.8 Aids to Navigation

The M1 landing spot was not equipped with ground-based navigation aids. The aircraft operator utilized Global Positioning System (GPS) for navigation aid.

1.9 Communications

The helicopter was equipped with Very High Frequency (VHF) radio communication systems. The pilot used the VHF radios for routine communication with Air Traffic Control (ATC).

There was no ground-based communication system available in the M1 landing spot, and the pilot should broadcast in certain VHF frequency to inform the position and communicate with other pilot for the traffic communication.

1.10 Aerodrome Information

The landing spot at Mining 1 (M1) was unprepared heliport which located near mining area on coordinate 5° 0'29.26"S 140° 9'5.70"E. The landing spot situated at unpaved road which connected houses in the settlement area.

Figure 3: Mining 1 landing spot

1.11 Flight Recorders

The aircraft was not fitted with a flight data recorder or cockpit voice recorder. Neither recorder was required by current Indonesian aviation regulations.

1.12 Wreckage and Impact Information

Based on information from the local resident at the occurrence site, after contacted with the tail rotor, the fatally injured resident was found in face down position.

Both tail rotor blades were damaged, and the damages were as follows:

Figure 4: The tail rotor blades damaged

The visual inspection after the accident identified that the tail rotor driveshaft and flexible coupling discs were normal. The inspection also did not find any debris on the magnetic chip detector.

1.13 Medical and Pathological Information

Medical and pathological information were not available at the time of the issuance of this report. Should any relevant medical and/or pathological information be obtained during this investigation, it will be included in the final report.

1.14 Fire

There was no evidence of fire during and after the tail rotor impact.

1.15 Survival Aspects

The local resident was fatally injured after the impact with the tail rotor.

1.16 Tests and Research

Test and research information were not available at the time of the issuance of this report. Should any relevant tests and/or research information be obtained during this investigation, it will be included in the final report.

1.17 Organizational and Management Information

1.17.1 Helicopter Operator

The helicopter was operated by PT Carpediem Aviasi Mandiri (Carpediem Air) which had valid Air Operator Certificate (AOC) number of 135-061. The Carpediem Air was authorized by the Directorate General of Civil Aviation (DGCA) to conduct air transportation carrying passenger and cargo in unscheduled operation within and

outside Indonesia for aircraft operations under Civil Aviation Safety Regulation (CASR) Part 135.

The Carpediem Air developed operation manuals (OM)s which contains company policies and procedures that had been approved by the Directorate General of Civil Aviation (DGCA).

1.17.1.1 Safety on Helicopter Landing Area

The Carpediem Air Operation Manual (OM) Part B subchapter 1.12.1 described procedures regarding helipads and drop areas as follows:

> *A clean controlled helipad is mandatory for safe helicopter operations. Access to any helipad should be restricted to those personnel directly involved with helicopter operations. Where possible the area should be fenced to restrict public access. The helicopter Loadmaster should be in attendance during all helicopter operations to control people and cargo movement. The area should be kept free of all debris and loose articles likely to be blown about by rotor wash, particularly iron and plastic sheeting used to protect cargo awaiting transshipment.*
>
> ...

The Carpediem Air did not assign a Helicopter Loadmaster as the flight operation was conducted using pilot self-dispatch system, which means a system where authority and responsibility for flight release, operation and flight following have been delegated solely to the Pilot in Command. In terms to control people and cargo movement, the company assigned one Helicopter Landing Officer (HLO) on board the helicopter, considering that several landing spots in Papua were unprepared helipad and most of them were at remote area.

1.17.1.2 Operational Personnel Responsibility and Requirement

The Carpediem Air Operation Manual (OM) Part A subchapter 2.5 described responsibility of Pilot in Command (PIC) as follows:

> *The PIC is responsible for the preparation and execution of the flight, and has the final authority as to the safety of the aircraft and its payload. He has the authority to take such measures as necessary for the safety of the flight, and take such reasonable actions to maintain order and discipline on board.*

The Carpediem Air determined the Helicopter Landing Officer (HLO) has the same role and responsibility with the Flight Operation Officer (FOO). The OM Part A subchapter 2.6.4. described HLO responsibility as follows:

> *The FOO/HLO are responsible to the Operations Manager. He shall carry out those tasks delegated to him by the Operations Manager which shall include but are not limited to:*
>
> *a. Responsible for flight following*
> *b. Responsible for the safe and efficient running of the radio and operations room and all ground operational elements*
> *c. Immediately advising the Operations Manager in the event of an accident, incident or occurrence*
> *d. Liaison with the customer and or the applicable company department*

e. *Keeping the customer informed as necessary regarding the progress of all flight tasks*
f. *Is responsible for execution of flight clearances, stored flight plans and slots*
g. *Ensuring the availability of up-to-date meteorological information and briefing*
h. *Responsible for the filing of journal related matters such as manifest, Operational flight plan, Load sheets and other flight document as required by Operations Manuals.*
i. *Weight and manifest all passengers and freight and assist in the loading and unloading of passengers and freight.*
j. *Follow all security / screening checks as required under the guidelines laid down by local authorities and Carpediem Air.*
k. *Preparing all loads to ensure that they are secure and fastened properly and their weights accurately determined before loading.*

According to the OM Part A subchapter 5.5, the qualification requirement for HLO was as follows:

1. *Hold / has held FOO or HLO License*
2. *Knows the contents of the Carpediem Air Operations Manual, flight dispatch procedures, passenger / cargo handling procedures, and provisions of this part necessary to the proper performance of his duties.*

1.17.1.3 Hazard Identification and Risk Assessment

The Safety Management System Manual (SMSM) subchapter 9.5 described hazard identification as follows:

> *Reactive and proactive schemes for hazard identification are the formal means of collecting, recording, analyzing, acting on and generating feedback regarding, hazards and the associated risks that can affect the safety of the operational activities.*
>
> *Carpediem Air will use the Predictive and Proactive approach to Hazard identification.*

The process of the hazard identification described in the SMSM subchapter 9.5.3 as follows:

> *The hazard identification process shall include the following steps:*
>
> - *Reporting of hazards, events or safety concerns*
> - *Collection and storing the safety data*
> - *Analysis of the safety data*
> - *Distribution of the safety information distilled from the safety data.*

The SMSM subchapter 9.6, describe risk assessment process as follows:

> *Having confirmed the presence of a safety hazard, some form of analysis is required to assess its potential for harm or damage. Typically, the assessment of the hazard involves three considerations.*

a. The probability of the hazard precipitating an unsafe event (i.e. the probability of adverse consequences should underlying unsafe conditions be allowed to persist).

b. The severity of the potential adverse consequences, or the outcome of an unsafe event; and

c. The rate of exposure to the hazards. The probability of adverse consequences becoming greater through increased exposure to unsafe conditions. Thus, exposure may be viewed as another dimension of probability. However, some methods of defining probability may also include the exposure element, for example, a rate of 1 in 100,000 hours.

The subchapter 9.6 also described several conditions which required a risk assessment, including

...

f. If Carpediem Air is undergoing structural changes, such as rapid growth and expansion, the influx of a large group of new operational staff, new route structure or introduction of new aircraft types.

...

On 17 February 2021, the Carpediem Air conducted hazard identification and risk assessment for Bell 206 L4 helicopter operation in Papua area. The process identified several hazards including "safety on and around helicopter" and "security issues" as follows:

NO	HAZARD IDENTIFIED	SPECIFIC COMPONENTS OF THE HAZARD	ASSOCIATED RISKS	CURRENT MEASURES TO REDUCE RISKS	RISK INDEX	FURTHER ACTION TO REDUCE RISK	RISK INDEX
4	Safety on and around helicopter	FOD and people near the aircraft	1. Aircraft damage 2. Injury or fatality	1. Pax Safety Briefing 2. Ensure the area are clean, free of debris or loosing objects 3. Ensure all pax and/or cargo are secured.	3B	1. Do all possible to get ground personnel assistance 2. Observe and ensure all personnel and cargo movements are within pilot's sight	2D
5	Security issue	Security threat	1. Aircraft damage 2. Injury or fatality	1. Coordination with local government or security auth to obtain information concerning security issue in the area 2. Observe or obtain security information from other operators 3. Obtain Security Clearance if appropriate.	3B	1. Check and recheck for security threat at departure, enroute and destination. 2. Always conduct reconnaissance flight to observe the area prior to landing.	2D

Figure 5: Sample of HIRA on Papua flight operation

The Carpediem Air did not conduct Hazard Identification and Risk Assessment (HIRA) for the specific Bell 206 B3 helicopter operation to M1, considering that the HIRA for Bell 206 L4 helicopter operation in Papua area has represented the flight operation to M1.

1.17.2 Directorate General of Civil Aviation

Civil aviation in Indonesia is regulated and oversighted by Directorate General of Civil Aviation (DGCA) under the Ministry of Transportation.

The DGCA has several directorates including Directorate of Airworthiness and Aircraft Operation (DAAO), and Directorate of Airport. The DAAO is responsible in

formulating regulation of airworthiness and flight operation, including oversight to the civil aircraft operator. The Directorate of Airport is responsible in formulating regulation of aerodrome operation and its personnel including oversight to the aerodrome operator.

The Ministry of Transportation Decree Number PM 37 Year 2021 regulated the aerodrome personnel which include Helicopter Landing Officer (HLO). The article 4 of the decree required the aerodrome personnel, including the HLO must held a competency certificate from training provider authorized by Ministry of Transportation.

1.18 Additional Information

The investigation is continuing, should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1.19 Useful or Effective Investigation Techniques

The investigation was conducted in accordance with the KNKT approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 FINDINGS

The findings are statements of all significant conditions, events or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal, or indicate deficiencies. Some findings point out the conditions that pre-existed the accident sequence, but they are usually essential to the understanding of the occurrence, usually in chronological order.

In this occurrence, the KNKT identified several findings as follows:

1. The helicopter had a valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R). Prior to the departure, there was no record or report of helicopter system malfunction.
2. The pilot held valid Commercial Pilot License (CPL) and qualified as Bell 206 B3 helicopter pilot. The Helicopter Landing Officer (HLO) held a HLO license that has been due at the day of the accident.
3. Both pilot and HLO had encountered several securities issues during flight operation at Papua area, included local resident who forced to get on board the helicopter.
4. Prior to the accident, the pilot and HLO had performed nine landings. The accident flight was the first flight for the pilot to M1 on that day.
5. The helicopter landed at unpaved road which connected houses in the settlement area at M1 which potentially generates people movement from behind and front of the helicopter.
6. Considering that the cargo unloading process would not take more than five minutes, the pilot did not shut down the engine and waited inside the helicopter while the rotor blades were still running. The same method was also conducted during the previous nine flights.
7. The HLO observed that there were no people near the helicopter except the customer who went to the left side of the helicopter to observe the unloading process. The pilot who waited inside the aircraft observed several local residents stood about 40 meters in front of the helicopter, watching the unloading process.
8. When HLO unloaded the cargo, the HLO heard a loud sound came from the rear section of the helicopter. The HLO looked to the source of the sound and saw a person has laid on the ground. About the same time, the HLO noticed that the customer ran away from the helicopter followed by several people who stood in front direction of the helicopter.
9. The HLO thought that a danger situation was happening as several people ran away from the helicopter. Thereafter, the HLO went to the helicopter and advised the pilot to take off immediately. The pilot who also aware of several people ran away from the helicopter decided to take off as he assumed that there was security issue.
10. The BAGGAGE DOOR caution light illuminated during the flight as the HLO has not closed the baggage door. Afterward, the HLO advised the pilot that he saw a person laid on the ground and concerned about their security. The pilot then

decided to return to Iwot Helipad as there was no other abnormal indication of the helicopter system.

11. The person who laid on the ground was a local resident who approached the helicopter with intention to ask to get onboard. The local resident impacted the tail rotor blades and fatally injured.
12. Both tail rotor blades were damaged. The visual inspection after the accident identified that the tail rotor driveshaft and flexible coupling discs were normal. The inspection also did not find any debris on the magnetic chip detector.
13. The Carpediem Operation Manual (OM) Part B subchapter 1.12.1 described that access to any helipad should be restricted to those personnel directly involved with helicopter operations. Where possible the area should be fenced to restrict public access. During all helicopter operations, the movement control of people and cargo should be managed by Helicopter Loadmaster.
14. The Carpediem Air did not assign a Helicopter Loadmaster as the flight operation was conducted using pilot self-dispatch system. In terms to control people and cargo movement, the company assigned one Helicopter Landing Officer (HLO) on board the helicopter, considering that several landing spots in Papua were unprepared helipad and most of them were at remote area.
15. During the accident, the HLO did not aware of the local resident movement near the tail rotor as he performed the cargo unloading task in accordance with the HLO responsibility stated in the OM Part A subchapter 2.6.4.
16. According to the OM Part A subchapter 2.6.4, besides assisting the unloading cargo, the HLO also responsible for the safe and efficient of all ground operational elements.

3 SAFETY ACTION

At the time of issuing this draft Final Report, the KNKT had been informed of safety actions taken by the helicopter operator resulting from this occurrence.

3.1 Carpediem Air

On 6 December 2022, issued safety notice to pilots, engineers, Helicopter Landing Officers (HLOs) and all operational support personnel, which reminded:

1. Improving the awareness of person and cargo movement near the tail rotor and ensuring no obstacle near tail rotor.
2. Always to approach and leave the helicopter to the front direction of the helicopter and after receiving safe signal from the pilot.
3. Do not approach and/or leave the helicopter on upslope ground.
4. Perform reconnaissance procedure prior to takeoff or land for ensuring no personnel movement from the aft direction of the helicopter.
5. If possible, park the helicopter in location that tail section of the helicopter cannot be reached by people.
6. If possible, approach or leave the helicopter after the rotors have stopped.

4 SAFETY RECOMMENDATIONS

The KNKT acknowledges the safety actions taken by Carpediem Air and considered that the safety action was relevant to improve safety, however there still safety issues remain to be considered. Therefore, the KNKT issued safety recommendations to address safety issues identified in this report.

The safety recommendation in this investigation report is made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident.

4.1 Carpediem Air

- **04.O-2022-18.01**

  Carpediem Operation Manual (OM) Part B described that access to any helipad should be restricted to those personnel directly involved with helicopter operations. Where possible the area should be fenced to restrict public access. During all helicopter operations, the movement control of people and cargo should be managed by Helicopter Loadmaster.

  The Carpediem Air did not assign Helicopter Loadmaster. In terms to control people and cargo movement, the company assigned one Helicopter Landing Officer (HLO) on board the helicopter.

  During the accident, the HLO did not aware of the local resident movement near the tail rotor as he was performing the cargo unloading which made the task of people movement was unable to be controlled properly.

  Therefore, KNKT recommends the Carpediem Air to review the method for ensuring that the people movement could be controlled properly.

- **04.O-2022-18.02**

  Carpediem Safety Management System Manual (SMSM) described several conditions which required a risk assessment, including when the company open new route structure. The Carpediem Air has conducted hazard identification and risk assessment (HIRA) for Bell 206 L4 helicopter operation in Papua area. The process identified several hazards including people's safety on and around helicopter. The mitigation for the hazard included to obtain all possible ground personnel assistance and to ensure all people movement were within pilot's sight.

  The landing spot at Mining 1 was unpaved road which connected houses in the settlement area at M1 which potentially generates people movement from behind and front of the helicopter. The people movement behind the helicopter is considered hazard as the movement was outside pilot's sight. In addition, there was no ground personnel available at M1 except the HLO on board the helicopter to ensure all people movement were within pilot's sight. Based on those conditions, the mitigations for the identified hazard for helicopter operation in Papua area was not sufficient to mitigate the hazard at M1.

  Therefore, KNKT recommends the Carpediem Air to conduct hazard identification and risk assessment (HIRA) for specific route of flight operation for ensuring the hazard can be identified and mitigated properly.

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