



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

# **PRELIMINARY**

**KNKT.23.01.01.04**

**Aircraft Serious Incident Investigation Report**

**PT Semuwa Aviasi Mandiri**

**DHC6-300; PK-SMS**

**Beoga, Papua**

**Republic of Indonesia**

**23 January 2023**

**2023**

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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However, the KNKT fully recognizes that the implementation of recommendations arising from its investigations will in some cases incur a cost to the industry.

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Jakarta, 28 April 2023  
**KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI  
CHAIRMAN**



**SOERJANTO TJAHJONO**

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## ABBREVIATIONS AND DEFINITIONS

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AOC	:	Air Operator Certificate
AFM	:	Airplane Flight Manual
CASR	:	Civil Aviation Safety Regulation
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CPCP	:	Corrosion Prevention Control Program
CPL	:	Commercial Pilot License
CRM	:	Cockpit Resources Management
CVR	:	Cockpit Voice Recorder
GPS	:	Global Positioning System
KIAS	:	Knots Indicated Airspeed
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> (also known as National Transportation Safety Committee) is the safety investigation authority of Indonesia to conduct safety investigation under the provision of ICAO Annex 13.
lbs	:	Pound-Mass or Pound lbs has been derived from a Roman word <i>Libra</i> , it is represented by 'lb' or 'lbs'. Pound is a Latin word meaning 'a pound by weight'. One pound is equal to 0.45359237 kilograms.
LT	:	Local Time
OM-A	:	Operation Manual Part A
OM-B	:	Operation Manual Part B
OM-C	:	Operation Manual Part C
OM-D	:	Operation Manual Part D
PF	:	Pilot Flying
PIC	:	Pilot in Command
PNF	:	Pilot non-Flying
SD	:	Secure Digital
SIC	:	Second in Command
SOP	:	Standard Operating Procedure
TIBA	:	Traffic Information Broadcast by Aircraft
UTC	:	Universal Time Coordinated
VHF	:	Very High Frequency
VFR	:	Visual Flight Rules

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## SYNOPSIS

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On 23 January 2023, a DHC-6-300 Twin Otter aircraft, registered PK-SMS was being operated by PT Semuwa Aviasi Mandiri (SAM Air) on an unscheduled passenger and cargo flight from Mozes Kilangin Airport (WAYY), Timika, Papua to Beoga Airstrip (WAVO), Puncak, Papua. The flight was conducted in accordance with Visual Flight Rules (VFR).

At 2149 UTC (0649 LT), in daylight condition, the aircraft departed from Timika to Beoga. On board the aircraft were two pilots, one engineer and eleven passengers. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot non-Flying (PNF). The flight until commenced approach was uneventful.

The aircraft landed on Runway 16, touched down about 240 meters from the beginning of the runway and veered to the right. The pilot attempted to manage directional control by applying left rudder and asymmetry engine power. The aircraft kept veered to the right then the pilot used the nose wheel steering.

The aircraft exited the runway, and travelled on the right runway shoulder. The right wing hit the trees near the runway shoulder during rolling and damaged the right wing. Afterward, the landing gear travelled on the soft soil and stopped on the right runway shoulder on heading about 114°.

The engine then shut down and the pilots, engineer and all the passengers evacuated the aircraft. No one injured in his occurrence.

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

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

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# 1 FACTUAL INFORMATION

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## 1.1 History of the Flight

On 23 January 2023, a DHC-6-300 Twin Otter aircraft, registered PK-SMS was being operated by PT Semuwa Aviasi Mandiri (SAM Air) on an unscheduled passenger and cargo flight from Mozes Kilangin Airport (WAYY), Timika<sup>1</sup>, Papua to Beoga Airstrip (WAVO), Puncak<sup>2</sup>, Papua. The flight was conducted in accordance with Visual Flight Rules (VFR).

At 2149 UTC (0649 LT), in daylight condition, the aircraft departed from Timika to Beoga. On board the aircraft were two pilots, one engineer and eleven passengers. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot non-Flying (PNF).

The last communication between the pilot and Timika Tower controller was when the pilot reported the position of about 25 nautical miles (Nm) from Timika at cruising altitude of 13,000 feet. Afterward the pilot changed the radio communication frequency to Traffic Information Broadcast by Aircraft (TIBA).

After passing Ilaga Pass, the aircraft started to descend. The PIC reduced the aircraft speed to around 85–90 knots with intention to manage separation with two other aircraft ahead which was PK-SNJ and PK-NGA.

When the aircraft was about 7 Nm from Beoga when the altitude was about 9,000 feet, the pilots of PK-SNJ aircraft advised that they would start the engine on the apron of Beoga.

The aircraft continued to descend and while the aircraft was about 2 Nm from Beoga, when altitude was about 7,500 feet, the pilot of PK-SNJ advised to the pilot of PK-SMS aircraft to land first and after that they would take off from Runway 34 and make a left turn to Tembagapura Pass.

While flying over Beoga, the PIC noticed there were two aircraft at Beoga and considered the limited space on the ground made the ground maneuvering would be difficult. The PIC advised the pilot of PK-SNJ to take off first and turn right because they intended to fly to the right base and land on runway 16.

While discussing with the pilot of PK-SNJ, the SIC observed the terrain ahead and informed the PIC, the PIC then decided to climb to 8,800 feet.

After about 7 nautical miles passing Beoga, the SIC noticed that PK-SNJ aircraft had been take off. The aircraft then turned to the right and joined right base Runway 16. While approaching key point, the PIC reduced the engine power and increased the rate of descend to reach altitude of 6,000 feet (400 feet AGL) on the final approach. The PIC noticed that the vertical speed increased up to 1,200 feet per minute, the airspeed was about 74 knots and the flap was selected at 20. Stall warning sounded then the PIC attempted to recover by increasing engine power.

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<sup>1</sup> Mozes Kilangin Airport (WAYY), Timika will be named as Timika for the purpose of this report.

<sup>2</sup> Beoga Airstrip (WAVO), Puncak will be named as Beoga for the purpose of this airport.



The aircraft touched down about 240 meters from the beginning Runway 16 and veered to the right. The pilot attempted to manage directional control by applying left rudder and asymmetry engine power. The aircraft kept veered to the right then the pilot used the nose wheel steering.

The aircraft exited the runway, and the right wing hit the trees near the runway shoulder during rolling. Afterward, the landing gear travelled on the soft soil and stopped on the right runway shoulder on heading about 114°.

The engine then shut down and the pilots, engineer and all the passengers evacuated the aircraft.

## 1.2 Injuries to Persons

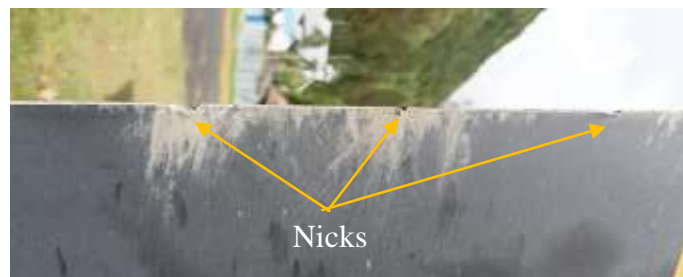
There were no injuries to person as a result of this occurrence.

## 1.3 Damage to Aircraft

The aircraft has substantially damaged. The right wingtip was broken, the right wing leading edge were bent at several points, and the propeller blades found nicks.



**Figure 1 Damage on the left wingtip and leading edge**



**Figure 2 Nicks on the propeller blade.**

## 1.4 Other Damage

There was no significant damage to the airstrip facility and environment.

## **1.5 Personnel Information**

### **1.5.1 Pilot In Command**

Gender : Male  
Age : 36 years  
Nationality : Indonesia  
Date of joining company : 2 May 2019  
License : CPL  
    Date of issue : 5 October 2011  
    Aircraft type rating : DHC-6  
Instrument rating validity : 30 September 2023  
Medical certificate : First Class  
    Last of medical : 1 September 2022  
    Validity : 9 March 2023  
    Medical limitation : Holder shall wear corrective lenses  
Last line check : 12 September 2022  
Last proficiency check : 12 September 2022

#### **Flying experience**

Total hours : 4,235 hours  
Total on type : 4,235 hours  
Last 90 days : 170 hours  
Last 60 days : 140 hours  
Last 24 hours : 51 minutes  
This flight : 51 minutes

### **1.5.2 Second In Command**

Gender : Male  
Age : 29 years  
Nationality : Indonesia  
Date of joining company : 26 July 2022  
License : CPL  
Date of issue : 18 September 2019  
Aircraft type rating : DHC-6  
Instrument rating validity : 31 July 2023  
Medical certificate : First Class

Last of medical	: 19 December 2022
Validity	: 19 June 2023
Medical limitation	: Holder shall wear corrective lenses
Last line check	: 26 September 2022
Last proficiency check	: 7 July 2022
Flying experience	
Total hours	: 312 hours 10 minutes
Total on type	: 150 hours 45 minutes
Last 90 days	: 108 hours 19 minutes
Last 60 days	: 70 hours 16 minutes
Last 24 hours	: 51 minutes
This flight	: 51 minutes

## **1.6 Aircraft Information**

### **1.6.1 General**

Registration Mark	: PK-SMS
Manufacturer	: De Havilland Canada
Country of Manufacturer	: Canada
Type/Model	: DHC-6 Series 300 (Twin Otter)
Serial Number	: 685
Year of Manufacture	: April 1980

### **Certificate of Airworthiness**

Date of issue	: 12 September 2022
Validity	: 11 September 2023
Category	: Normal
Limitation	: None

### **Certificate of Registration**

Number	: 4150
Date of issue	: 14 August 2022
Validity	: 13 August 2025
Time Since New	: 55,297 hours 51 minutes
Cycles Since New	: 89,650 cycles
Last Major Check	: Corrosion Prevention Control Program (CPCP) 4 of 5
Last Minor Check	: Inspection C-13

### **1.6.2 Engines**

Manufacturer	: Pratt & Whitney
Type/Model	: PT6A-27
Serial Number-1 engine	: PCE-40529
Time Since New	: 20,390 hours 9 minutes
Cycle Since New	: 23,870 cycles
Serial Number-2 engine	: PCE-PG0047
Time Since New	: 23,385 hours 27 minutes
Cycle Since New	: 24,845 cycles

### **1.6.3 Propellers**

Manufacturer	: Hartzell Propeller
Type/Model	: HC-B3TN-3D
Serial Number-1 propeller	: BUA-21071
Time Since New	: 37,451 hours 36 minutes
Serial Number-2 propeller	: BUA-27520
Time Since New	: 17,679 hours 11 minutes

### **1.6.4 Weight and Balance**

The aircraft was operated within the weight and balance envelope. According to the weight and balance sheet of the occurrence flight, the calculation of the takeoff weight was 12,500 lbs (maximum of 12,500 lbs) and the landing weight was estimated at 12,100 lbs (maximum of 12,300 lbs). According to Airplane Flight Manual (AFM), landing speed for load 12,300 lbs and flap 20 is 80 KIAS.

### **1.7 Meteorological Information**

Meteorological information at Beoga was provided by Indonesian military personnel in the Airstrip. The information communicated using text, image or video submitted via mobile phone to the operation personnel and pilot in Timika.

During flight preparation pilot received weather in Beoga was good. During approach and landing, the pilot noticed that the weather was clear and the wind was calm.

### **1.8 Aids to Navigation**

The aircraft was fitted with a Global Positioning System (GPS) Garmin GNS 430, which has the capability to provide navigation data. The Garmin GNS 430 is not equipped a Secure Digital (SD) card.

The SAM Air developed route guidance in the Operation Manual Part C (OM-C) which included area and airstrip information for Timika to Beoga. The route guidance for Timika – Beoga are shown in the figure below.

**1. TIMIKA – BEOGA**  
**A. ROUTE GUIDE**  
**GPS PLAN**



WAYY R065	TMK R065 – TMBAGA – ILAGACUT – UPAZZ – ILAGA – ILANRTH – BEOE – BEOFPZ – FF16BEO – BEO
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*For Approach See Point C On This Section*

**Figure 3 Route Guide GPS Plan Timika - Beoga**

**B. ROUTE INFORMATION**

Approximately flight time 40 MIN/100 NM

Altitude: Remains visual recommend 13.000 at mountain area.

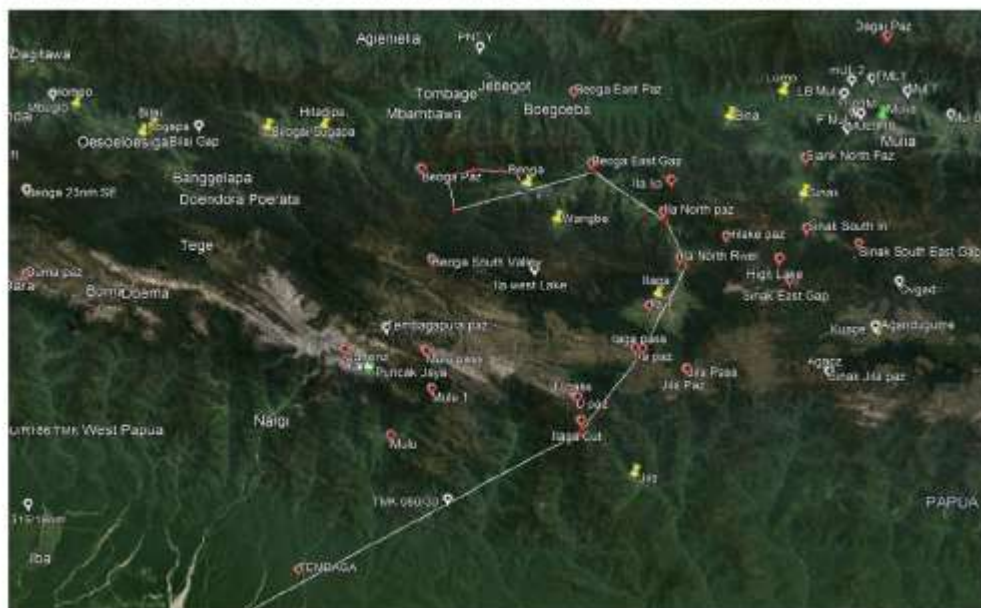
**Departure from TMK:** After Takeoff Maintain runway heading or left/ right turn, proceed to TEMBAGA R 065 continue climb to 13.000 ft or instructed by ATC, monitor TIBA 122.90 after 25 NM after leaving TMK.

**Descend:** Visual only, at pilot discretion and monitor terrain, then continue descend to circuit 7000 ft final via overhead and join right base 16 BEO.

Recommend departure BEO continue climb right turn follow checkpoint

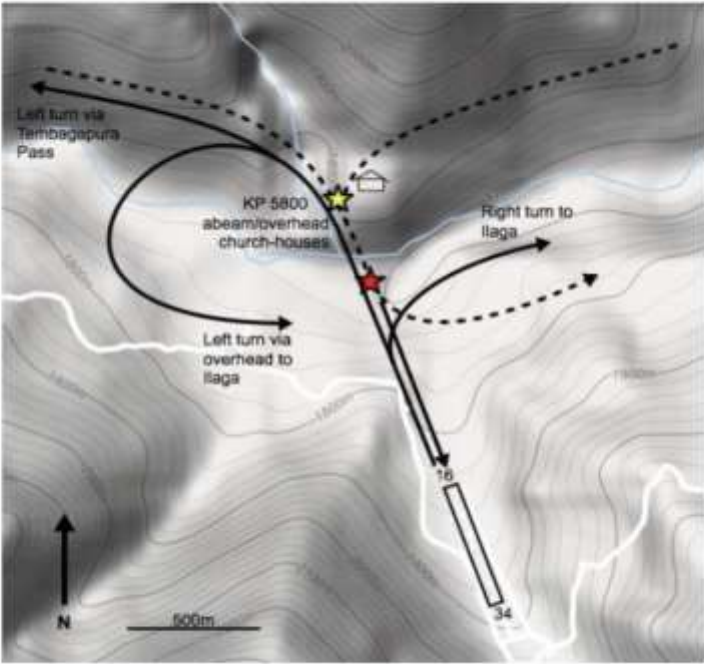

For landing see airport information on this section point C

**All descent below 10,000 feet must be visual or expected to remain visual**



**Figure 4 Route Information Timika - Beoga**

**C. AIRSTRIP INFORMATION**

BEO	AIRSTRIP	MINIMA	RFFS	RUNWAY		RNY CAT	RADIO
	BEOGA	5800	N/A	TAKE OFF : 34	LANDING : 16	4	122
<b>LENGTH</b>	<b>WIDTH</b>	<b>TDZE</b>	<b>SLOPE</b>	<b>ELEVATION</b>	<b>KEYPOINT</b>	<b>GPS COORDINATE</b>	
500 m	25 m	5600 FT	12%	5600 FT	5800 FT	S 03 48.97 E 137 25.48	
<b>SURFACE</b>	: ASPHALT						
<b>OBSTACLE</b>	: High terrain all around. Situated in tight valley.						
							
							
<b>ABORT LANDING</b>	: Just passing KP on final, left turn out. Straight off the upper end if unable to stop.						
<b>ABORT TAKEOFF</b>	: 10-25m into take-off roll, abeam the first electric pole. Continue straight off the low						
<b>WEATHER PATTERN</b>	: Normally good in the morning until midday then closing down with cloud and rain. Up-valley winds start picking up around 9am. Clouds can quickly form/disappear, monitor closely your escape plan in marginal VMC.						

**Figure 5 Beoga Airstrip Information**



## **1.9 Communications**

The aircraft was equipped with Very High Frequency (VHF) radio communication systems. The pilot used the VHF radio for communication with Timika Tower controller until 25 nautical miles from Timika and then change to Traffic Information Broadcast by Aircraft (TIBA) frequency 122.9 MHz for communication with other aircraft.

The detail of the communication will be described in the final report.

## **1.10 Aerodrome Information**

Airport Name	: Beoga
Airport Identification	: WAVO
Airport Operator	: Directorate General of Civil Aviation (DGCA)
Coordinate	: 03°48.97' S; 137°25.48' E
Elevation	: 5,600 feet
Runway Direction	: 16/34
Runway Length	: 500 meters
Runway Width	: 25 meters
Surface	: Asphalt

## **1.11 Flight Recorders**

The aircraft was not fitted with a Flight Data Recorder (FDR), as it was not required by current Indonesian aviation regulations. The aircraft was fitted with a Cockpit Voice Recorder (CVR) manufactured by Honeywell with part number 980-6022-011 and serial number 1075. For convenience, the download process was conducted at the operator's main base in Jayapura using CVR downloader equipment provided by the operator. The download process was performed by the operator's recorder specialist and supervised by KNKT investigator.

The CVR data download process successfully retrieved 125 minutes of recorded data. The occurrence flight data was not recorded, and the last recorded data was the flight from Timika to Ilaga, while the date has not yet been confirmed. The investigation will find out when the last audio file was recorded.

The CVR system is equipped with inertia/impact switch model 3LO-453/3 which will stop the CVR from recording when an impact (vertical acceleration) of predetermine value. Inspection after the occurrence by the maintenance personnel found that the inertial switch had been activated. After resetting the inertial switch, the CVR functioning normally.

## **1.12 Wreckage and Impact Information**

There was no obvious tire mark visible on the runway. The first tire mark was found on the runway edge approximately five meters after the predicted aircraft touched



down position. The mark was identified as the mark of the right main wheel. About three meters from the first tire mark, another tire mark was found in parallel with the first tire mark, which was identified as the nose wheel mark.

The nose wheel and right main wheel marks continued along the runway shoulder to the slightly right direction. Approximately 100 meters, another tire mark was found which was identified as the left main wheel track.

The tire marks continued along the runway shoulder until the aircraft stop position about 400 meters from beginning Runway 16.

The right wing tip damage and the leading edge dents were caused by impact with the trees near the right runway shoulder, in a position approximately 320 meters from the beginning Runway 16.



**Figure 6 The wheel marks found on the occurrence site**

The last position of the aircraft is shown in the figure below.



**Figure 7 The aircraft condition after stopped**

### **1.13 Medical and Pathological Information**

No medical or pathological investigations were conducted as a result of this occurrence.

### **1.14 Fire**

There was no evidence of in-flight or post-impact fire.

### **1.15 Survival Aspects**

After the aircraft stopped, the pilots, engineer, and passengers evacuated by themselves from the aircraft with no injuries.

### **1.16 Tests and Research**

Test and research information were not available at the time of the issuance of this report. Should any test and research information be obtained during this investigation that is relevance to this investigation, it will be included in the final report.

### **1.17 Organizational and Management Information**

#### **1.17.1 Aircraft Operator**

The aircraft was operated by PT. Semuwa Aviasi Mandiri (SAM Air) which had valid Air Operator Certificate (AOC) number 135-064. The SAM Air is authorized to conduct air transportation carrying passenger and cargo in scheduled and non-scheduled operation within and outside Indonesia for aircraft operations under Civil Aviation Safety Regulation (CASR) Part 135.

##### **1.17.1.1 Events To Be Reported to The Company**

The SAM Air Operation Manual, Part A, Chapter 11: Handling of Accidents and Occurrences, also describes reporting procedures for accident, incident, serious incident, and any other occurrence.

SAM Air also encourages all operational personnel to report any aircraft handling difficulties event beyond the regulatory requirement regarding the reporting of specific occurrences as follows:

##### *11.5.14.1. Aircraft Handling Difficulties*

- a. Flying too close to ground, ground hit during landing or takeoff, including tail strike/over rotation and pod or wing strike, aircraft not obtaining/maintaining the assigned altitude;*
- b. Abrupt maneuver, excessive pitch attitude, aircraft trim problems, un-commanded roll, or un-commanded turn;*
- c. Flight crew does not understand/not follow/not expect what the aircraft systems are doing;*
- d. Ground loop on takeoff-landing for avoid obstacles or as a result of losing directional control;*
- e. Landing and take-off events which could affect safety, including overrun, long landing, off center-line, and hard landing, undershoot un-stabilized approach.*

### **1.18 Other information**

The investigation is continuing and KNKT plans to complete the investigation within 12 months since the day of the occurrence. Should any further relevant safety issues emerge during 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.

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## 2 FINDINGS

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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 aircraft had a valid Certificate of Airworthiness (C of A) and a valid Certificate of Registration (C of R). Prior to the occurrence flight, there was no record or report of aircraft system malfunction.
2. During the occurrence flight, the aircraft was operated within the weight and balance envelope.
3. Both pilots held valid licenses and first-class medical certificates with medical limitation to wear corrective lenses.
4. The last proficiency check results of both pilots were satisfactory without any remark.
5. During the accident flight, the PIC acted as Pilot Flying (PF) and the SIC acted as Pilot non-Flying (PNF).
6. The CVR data download was successful however, the occurrence flight data was not recorded and the last recorded data was a flight Timika to Ilaga. The CVR stop recording most likely due to the activation of the inertial switch during a landing with a vertical acceleration reached the predetermined value on the previous flight. After resetting the inertial switch, the CVR functioning normally.
7. While on the final approach, the PIC noticed that the vertical speed reached up to 1,200 feet per minute, the airspeed was about 74 knots, the flap was selected at 20 and the stall warning active. The PIC then attempted to recover by increasing engine power.
8. The aircraft touched down on Runway 16, approximately 240 meters from beginning of runway, afterward travelled on the runway shoulder. The pilot attempted to recover by applying the rudder pedal and performing differential thrust. The aircraft kept veered to the right then the pilot used the nose wheel steering and the pilot used nose steering to turn the aircraft back to the runway.
9. The right wing hit several trees while the aircraft travelled of the runway shoulder.
10. The aircraft stopped on the right runway shoulder on heading about 114°, about 400 meters from the beginning of Runway 16. The engine then shut down and all the occupants evacuated the aircraft without any injury.

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### **3 SAFETY ACTION**

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At the time of issuing this preliminary Report, the KNKT had been informed of some safety actions taken by the SAM Air, on 7 February 2023 issued safety notice number 003/QSS-SN/II/2023 to recommend as follows:

1. The recurrent ground training for all pilot should be performed continuously in accordance with Operation Manual Part D, Appendix II, section 5.
2. The Ground Instructor shall include pilot basic knowledge as part of the training material in the recurrent ground training to refresh pilot knowledge.
3. During the ground and flight training, the Flight Instructors should emphasize the implementation of the Crew Resources Management (CRM) by all SAM Air Pilots including carrying out standard callout procedures in accordance with the procedures in the operation manual, carrying out tasks according to their roles and functions as Pilot Monitoring (PM) or Pilot Flying (PF), and always communicating effectively. (Operation Manual Parts A and B, as well as Standard Operating Procedures (SOP C208 and SOP DHC6-300).
4. All SAM Air Pilots not to be overconfident, which results in a lack of awareness of flight safety.

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## **4 SAFETY RECOMMENDATIONS**

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The Komite Nasional Keselamatan Transportasi acknowledges the safety actions taken by SAM Air and considered that the safety actions were 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 safety improvement to 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 PT Semuwa Aviasi Mandiri (SAM Air)**

- **04.O-2023-01.01**

The CVR did not record the occurrence flight and several previous flights, which likely due to the inertial switch have been activated during a hard landing when the vertical acceleration exceeded the predetermined value. There was no pilot report of a hard landing therefore the inertial switch did not reset. According to OM-A Section 11.5.14.1, hard landings are included in the list of events to be reported to the company.

Therefore, KNKT recommends to SAM Air to ensure any event stated in the list of OM-A Section 11.5.14.1, to be reported in timely manner.

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