



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

**FINAL**

**KNKT.20.04.06.04**

**Aircraft Serious Incident Investigation Report**

**PT Sinar Mas Super Air**

**Pacific Aerospace FU 24-950 Fletcher; PK-PNZ**

**Mambruk Airstrip, Lereh, Papua**

**Republic of Indonesia**

**20 April 2020**

**2021**

This Final Report was produced by the *Komite Nasional Keselamatan Transportasi* (KNKT), 3<sup>rd</sup> Floor Ministry of Transportation, 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).

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Jakarta, 15 December 2021

**KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI  
CHAIRMAN**



**SOERJANTO TJAHOJONO**

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## ABBREVIATIONS AND DEFINITIONS

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C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
DGCA	:	Directorate General of Civil Aviation
HF	:	High Frequency
ICAO	:	International Civil Aviation Organization
Kg	:	Kilograms
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> (National Transportation Safety Committee)
LT	:	Local Time
M	:	Meter(s)
OC	:	Operating Certificate
PPL	:	Private Pilot License
PT	:	<i>Perseroan Terbatas</i> (Ltd - Limited)
RIV	:	Rapid Intervention Vehicle
TSO	:	Time Since Overhaul
UTC	:	Universal Time Coordinated
VFR	:	Visual Flight Rules

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## SYNOPSIS

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On 20 April 2020, a Pacific Aerospace FU 24-950 (Fletcher) aircraft, with registration PK-PNZ operated by PT Sinar Mas Super Air as agriculture (fertilizer spraying) flight in Mabruk Airstrip, Lereh, Papua. The pilot conducted 15 fertilizer spraying flights, with estimated flight time of 10 minutes for each flight.

The west side area of Mambruk airstrip was an area dedicated as conservation and some local people utilized the conservation area on the left side of threshold runway 36 as livestock boar farming. The dead boar has been confirmed to be owned by local people whose farming on conservation area on the left side of runway 36.

No one injured on this occurrence and the aircraft had minor damage.

The investigation concluded the contributing factor of the occurrence was that the aircraft nose wheel collapsed after impacted a boar that was on the airstrip. The fence and gutter condition allowed the boar to cross and entered the airstrip.

During the investigation, the *Komite Nasional Keselamatan Transportasi* (KNKT) has been informed several safety actions taken by aircraft operator and airstrip operator. The KNKT acknowledged the safety actions taken and considered relevant to improve the safety issues identified in this investigation. Therefore, the KNKT is not issuing safety recommendations in this report.

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# 1 FACTUAL INFORMATION

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## 1.1 History of the Flight

On 20 April 2020, a Pacific Aerospace FU 24-950 (Fletcher) aircraft with registration PK-PNZ, operated by PT Sinar Mas Super Air as agriculture (fertilizer spraying) flight in Mabruk Airstrip<sup>1</sup>, Lereh, Papua. The aircraft was single pilot operated aircraft. The flight was planned to conduct fertilizer spraying flight on Blok M71 of Mambruk palm estate.

Prior to the flight, the pilot discussed with ground support team about the weather, flight plan, and the amount of fertilizer for each flight. The pilot planned conduct 15 fertilizer spraying flights, with estimated flight time of 10 minutes for each flight.

The engineer conducted a pre-flight check and released the aircraft for flight.

The weather was clear, consistent with the weather forecast for the day. The pilot communicated with ground support team by utilizing Rapid Intervention Vehicle (RIV).

At 0810 LT, (19 April 2020, 2311 UTC<sup>2</sup>), the pilot started the fertilizer spraying flight. The flight from the 1<sup>st</sup> spraying until 14<sup>th</sup> spraying was uneventful.

About 1110 LT, after conducted 15<sup>th</sup> fertilizer spraying flight, the pilot approach to runway 36 of Mambruk airstrip. The landing approach and setup were normal, the aircraft touched down with the speed about 55 knot and continued to roll to the fertilizer bin at the end of runway 36.

During landing roll, the pilot heard an impact sound that was suspected from below the aircraft and thereafter the pilot felt that the aircraft nose became lower. The pilot applied the propeller to reserve and maximum braking to stop the aircraft.

The aircraft veered to the left side of runway 36 and stopped on the grass area on runway shoulder.

The pilot conducted shutdown engine procedure and disembarked the aircraft. The pilot observed the aircraft condition and found that the aircraft nose wheel collapsed and propeller blades were bent.

Later, the ground support team arrived and informed to the pilot that they found a dead boar about 120 metres from the beginning of runway 36.

No one injured on this occurrence. The damages to the aircraft were as follows:

- Nose gear cylinder fractured.
- Aircraft fuselage skin on lower attachment bracket crack;
- All three propeller blades bent,
- Engine air intake area damage,
- Engine starter generator fractured.

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<sup>1</sup> Mabruk Airstrip, Jayapura will be named as Mambruk for the purpose of this report.

<sup>2</sup> The 24-hours clock in Universal Time Coordinated (UTC) is used in this report to describe the local time as specific events occurred. Local time is UTC+9 hours.



**Figure 1: Aircraft After Occurrence**



**Figure 2: Damage to the propeller blades**





**Figure 3: Damage to the nose wheel**

## 1.2 Personnel Information

The pilot was 49 years old, joined the company since May 2011 and held a valid Private Pilot License (PPL). The pilot held second class medical certificate that valid up to 12 October 2020 with limitation *holder shall posses corrective lenses for correct of near vision*.

In 2016, the pilot trained for Fletcher aircraft type and the agriculture flight operation. Since 2016, the pilot dedicated to serve agriculture flight in Jambi and Lereh palm estate operation, which covered Cendrawasih airstrip and Mambruk airstrip.

The pilot's last line check and last proficiency check was performed on 17 May 2019.

The flying experiences of the pilot were as follows:

Total hours	:	1,572 hours
Total on type	:	1,410 hours
Last 90 days	:	91 hours 40 minutes
Last 60 days	:	91 hours 40 minutes
Last 24 hours	:	3 hours 14 minutes
This flight	:	2 hours

### 1.3 Aircraft Information

The Fletcher FU24-950M aircraft manufactured by Pacific Aerospace Corporation Ltd., New Zealand on 1972, with serial number of 172. The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

The aircraft had total flying hour of 19,423 hours and total flight cycle of 34,749 cycles. The last major check of the aircraft was corrosion inspection that was performed on 16 January 2018.

The last minor check was 300 hours inspection which was performed on 16 November 2019, when the aircraft had total flying hour was 19,192 hours.

The engine installed was PT6A-11AG manufactured by Pratt & Whitney Company in Canada. The engine serial number was PCE-RH096 with total flight hour of 5,789 hours and total flight cycle of 1,435 cycles. The engine time since last overhaul (TSO) was 1,770 hours.

The propeller installed in the aircraft was HC-B3TN-3D propeller model manufactured by Hartzell Propeller Incorporation in USA. The propeller serial number was BUA 31097 with total flight hour of 4,709 hours.

The PK-PNZ aircraft was installed with nose wheel mudguard (fender) in September 2008 by Super Air Limited, New Zealand.

### 1.4 Aerodrome Information

Airport Name	: Mambruk Airstrip
Airport Address	: Cendrawasih Estate, District of Lereh, Jayapura, Papua
Airport Operator	: PT. Sumber Indah Perkasa
Airport Certificate Number	: 012/RBU.KNP-DBU/2020 valid until 31 July 2021
Type of Traffic Permitted	: Day VFR only
Coordinate	: 02° 59' 51" S; 140° 02' 21" E
Elevation	: 265 metres
Runway Direction	: 18 – 36
Runway Length	: 790 m
Runway Width	: 20 m
Surface	: Gravel

Mambruk Airstrip was operated by PT Sumber Indah Perkasa, a palm plantation company. The airstrip operator managed two airstrips in District of Lereh, which were Cenderawasih Airstrip and Mambruk Airstrip.

The aircraft operator and airstrip operator were subsidiary of Sinar Mas Group holding company.

Mambruk Airstrip is dedicated for visual flight and was not equipped with ground base navigation aids. The ground support team consisted of an aircraft engineer and a rescue fire fighter personnel. The ground support team utilized Rapid Intervention

Vehicle (RIV) positioned near airstrip during a flight operation, which equipped with High Frequency (HF) radio, for ground to air radio communication.

The east side area of Mambruk airstrip was palm plantation area while the west side was area dedicated as conservation. No activity allowed within the conservation area as it may disturbed the environment and the wild life. However, some local people utilized the conservation area on the left side of threshold runway 36 as livestock boar farming.

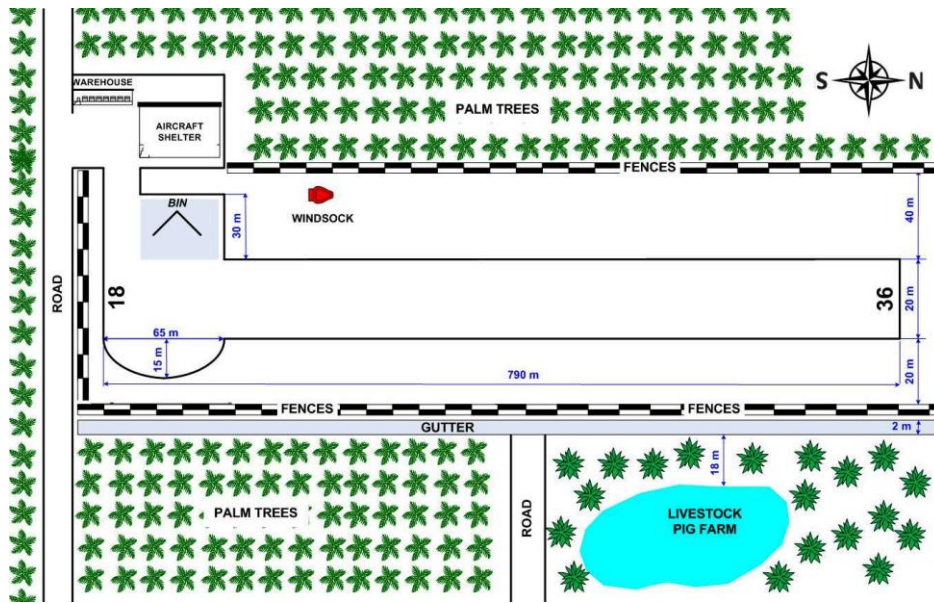


Figure 4: Mambruk Airstrip



Figure 5: Airstrip, Plantation and Conservation Area

The airport operator appointed a Unit and Airstrip Manager to maintain the airstrip condition in accordance with Indonesia Directorate General of Civil Aviation (DGCA) requirement.

The Unit and Airstrip Manager was aware that local people utilized some area on the conservation area on left side of threshold runway 36 as livestock boar farming. Several comprehensive approaches and campaigns have been done to introduce the purpose of conservation area and the risk of activity around airstrip area for both aircraft operator and for local people or their livestock, however the local people kept returning.

The Unit and Airstrip Manager decided to install fences around the airstrip and improved the gutter. The gutter was improved by 2 meters depth and 2 meters width, and was expected to prevent the wildlife entering the airstrip area.

## 1.5 Wreckage and Impact Information

The aircraft stopped on the grass area on left shoulder of Runway 36, about 320 meters from the beginning of the runway.

The ground support team conducted inspection on the runway and found a dead boar, about 120 meters from the beginning of the runway 36. The dead boar height was approximately 45 cm and the weight was approximately 15 kg. Some boar furs were found on the area around the aircraft nose wheel fork and the mudguard (fender). The wound pattern on dead boar shoulder was similar with wheel mudguard corner pattern.

The dead boar was confirmed to be owned by local people whose farming on conservation area on the left side of runway 36.



**Figure 6: Occurrence picture**



**Figure 7: Boar's Furs found in the Nose Wheel Fork**

## **1.6 Organizational and Management Information**

### **1.6.1 Aircraft Operator**

The Fletcher FU24-950 aircraft registered PK-PNZ was owned and operated by PT. Sinar Mas Super Air that had valid Operating Certificate (OC) number 137-001 which authorized the operator to perform agriculture and pest control flight operation.

PT. Sinar Mas Super Air was operating Fletcher FU24-950 and Thrush S2R-T34 aircraft.

### **1.7 Other Information**

Due to travel restriction and difficulties for travelling during Covid-19 pandemic, the investigation analysis base on data and documentation provided by Aircraft Operator and Airstrip Operator and interview with relevant parties

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## 2 ANALYSIS

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The analysis part of this report will discuss the relevant issues resulting in the wildlife impacted and aircraft veered off the runway on 20 April 2020 at Mambruk Airstrip, Papua.

The investigation determined that there were no issues with the aircraft and all systems were operating normally. The analysis will therefore discuss the failure of the nose landing gear and airstrip management.

The evidence of no abnormality reported to the aircraft system, the impact sound heard by the pilot followed by unusual attitude of the aircraft..

Most probably, after impact with the nose landing gear, the boar was run over the nose wheel and stuck on the nose wheel mudguard (fender). The wound pattern in dead boar shoulder was similar with nose wheel mudguard (fender) corner pattern.

Stuck position of the dead pig on the nose wheel mudguard (fender) probably created braking effect on aircraft nose wheel. This braking effect on a movement aircraft resulting to excessive stress, and nose wheel cylinder was fractured caused the aircraft became uncontrollable and the aircraft veered to the left.

The dead boar has been confirmed to be owned by local people whose utilized the conservation area on the left side of threshold runway 36 as livestock boar farming.

The airstrip management has put fences and gutter to prevent animal to enter the airstrip. The investigation found that some segments of the fence and gutter were not in a proper condition which allowed small size of boar or animals to pass and entering the airstrip. The fence and gutter inspection program did not monitor the fence and gutter condition.

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## 3 CONCLUSIONS

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### 3.1 Findings<sup>3</sup>

According to factual information during the investigation, the findings are as follows:

1. The aircraft had valid Certificate of Airworthiness and Certificate of Registration. No aircraft system malfunction reported before the occurrence. The investigation considered aircraft serviceability was not issue in this accident;
2. The aircraft was installed with nose wheel mudguard (fender) in September 2008.
3. The pilot held valid license and medical certificate;
4. The fertilizer spraying flights were uneventful until the landing roll when the landing was normal and the pilot continued to roll to the fertilizer bin, in the end of runway 36;
5. During rolling, the aircraft nose wheel hit a boar resulted in the the collapse of the nose landing gear and the aircraft became uncontrollable;
6. The dead boar has been confirmed to be owned by local people whose utilized the conservation area on the left side of threshold runway 36 as livestock boar farming.
7. The airstrip management has put fences and gutter to prevent animal to enter the airstrip. The investigation found that some segments of the fence and gutter were not in a proper condition and the fence and gutter inspection program did not monitor the fence and gutter condition.

### 3.2 Contributing Factors

Contributing factors is defines as actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

The investigation determines the contributing factors to this occurrence is, the aircraft nose wheel collapsed after impacted a boar that was on the airstrip. The fence and gutter condition allowed the boar to cross and entered the airstrip.

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<sup>3</sup> 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.

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## 4 SAFETY ACTION

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At the time of issuing this draft Final Report, the KNKT had been informed of safety actions taken by PT. Sinar Mas Super Air resulting from this occurrence.

1. PT. Sinar Mas Super Air letter number 016/SMSA/HO/VI/2020, dated 17 June 2020 informed the KNKT that they have conducted safety actions as follow:
  - Ensure that the airstrip is clean of grass and grass cutting should be carried out regularly;
  - The palm plantation company, as airstrip operator, has cleaned and improved the gutter condition around airstrip;
  - The palm plantation company, as airstrip operator, has repaired the fence condition around airstrip;
  - Coordinate with airstrip operator to held a meeting with local community. The result of meeting was the farming area would be relocated to Nawa riverside area, about 6 km from Mambruk Airstrip;
  - The airstrip operator built 2 security posts at the end of runway 36 and runway 18 and would be guarded 24 hours by palm company personnel.
2. PT. Sinar Mas Super Air issued Quality Notice Number FU24-950-QN/21/VIII/32-00/2020, dated 11 August 2020 regarding the prohibition of nose wheel mudguard (fender) installation on Fletcher Fu29-950 fleet.



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## **5 SAFETY RECOMMENDATIONS**

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The KNKT acknowledged the safety actions taken by the aircraft operator and the airstrip operated which were considered relevant to improve the safety issues identified in this investigation. Therefore, the KNKT is not issuing safety recommendations in this report.

## 6 APPENDIX

### 6.1 The Operator Comments

Reference Chapter, Page, Paragraph	Original Text	Proposed Amendment	Reason for Proposed Change	KNKT Response
1.2 Personnel Information Paragraph 2	Since 2016, the pilot dedicated to serve agriculture flight in Lereh palm estate operation, which covered Cendrawasih airstrip and Mambruk airstrip.	Proposed additional information that the pilot also serves agriculture flight in Jambi palm estate operation.	The operator fleet serve agriculture flight in Jambi and Papua palm estate operation. The pilot have rotation duty scheduled between all area.	Agreed. <i>Since 2016, the pilot dedicated to serve agriculture flight in Jambi and Lereh palm estate operation, which covered Cendrawasih airstrip and Mambruk airstrip.</i>
1.6.1 Aircraft Operator	PT. Sinar Mas Super Air was operating Fletcher FU24-950 and Thrush 34T aircraft	Correction for the Thrush aircraft.	Miss-type	Agreed. <i>PT. Sinar Mas Super Air was operating Fletcher FU24-950 and Thrush <del>34T</del> S2R-T34 aircraft</i>
2. Analysis Paragraph 3	The evidence of no abnormality reported to the aircraft system, the impact sound heard by the pilot followed by unusual attitude of the aircraft and the wound pattern on dead boar shoulder that was similar with wheel mudguard (fender) corner pattern showed that <i>the failure of the nose landing gear was caused by the impact with the boar.</i>	Proposed revised the sentences as follows: .... the fracture of nose landing gear was caused by a braking effect occurred on the nose gear after impact with the boar during landing roll.	The operator internal evaluation predicted that the sequences of events as: 1. the pig crossed into airstrip. 2. the pig was hit by aircraft nose wheel, 3. the pig run over by the wheel tire 4. the pig stuck on the nose wheel fender caused braking effect on the nose wheel. 5. The braking effect on the movement wheel resulting the nose landing gear fracture	Agreed with the operator opinion. The revised sentences became as follows: <i>The evidence of no abnormality reported to the aircraft system, the impact sound heard by the pilot followed by unusual attitude of the aircraft and the wound pattern on dead boar shoulder that was similar with wheel mudguard (fender) corner pattern showed that the failure of the nose landing gear was caused by the impact with the boar.</i> <i>Stuck position of the dead pig on the fender probably created braking effect on aircraft nose wheel. This braking effect on a movement aircraft resulting to excessive stress, and nose wheel cylinder was fractured and the attachment to the</i>

Reference Chapter, Page, Paragraph	Original Text	Proposed Amendment	Reason for Proposed Change	KNKT Response
				<i>airframe was crack.</i>
2. Analysis Paragraph 4	After impact with the boar, the nose landing gear collapsed and the aircraft became uncontrollable and the aircraft veered to the left.	Proposed revised the sentences as follows: After impact with the nose landing gear, the boar was run over the nose wheel and stuck on the fender which create a braking effect resulting on nose landing gear collapse. The aircraft became uncontrollable and veered to the left due to propeller strike.	Refer to operator internal evaluation and sequences of events prediction. The aircraft veer off to the left due to propeller strike effect, which the propeller rotation was counter clockwise rotation.	Refer to interview with the pilot, which stated that after the aircraft impacted with a boar, the pilot applied the propeller to reserve and maximum braking to stop the aircraft. It was difficult to determine that the aircraft veered to the left due to propellers strike effect. The Airplane Flying Handbook (FAA-H-8083-3B) Chapter 8 After-Landing Roll stated that <i>during the ground roll, the airplane's direction of movement can be changed by carefully applying pressure on one brake or uneven pressures on each brake in the desired direction. Caution must be exercised when applying brakes to avoid over controlling.</i>  The revised sentences became as follows: <i>After impact with the nose landing gear, the boar was run over the nose wheel and stuck on the fender which create a braking effect resulting on nose landing gear collapse, and resulted the aircraft became uncontrollable than the aircraft veered to the left.</i>

Reference Chapter, Page, Paragraph	Original Text	Proposed Amendment	Reason for Proposed Change	KNKT Response
3.1 Findings	-	Proposed new finding as follows 5. The aircraft was installed with nose wheel mudguard (fender)	In line with 1.3 Aircraft information that the nose wheel mudguard (fender) installed on the aircraft since 2008.	Agreed. <ul style="list-style-type: none"> <li>The aircraft was installed with nose wheel mudguard (fender) in September 2008.</li> </ul>
3.2 Contributing Factors	The investigation determines the contributing factors to this occurrence is: <ul style="list-style-type: none"> <li>The aircraft nose wheel collapsed after impacted a boar that was on the airstrip. The fence and gutter condition allowed the boar to cross and entered the airstrip.</li> </ul>	Proposed additional contributing factor as follows: <ul style="list-style-type: none"> <li>The mudguard (fender) installed allowed the occurrence of braking effect of nose landing gear due to boar stuck on it.</li> </ul>	Refer to operator internal evaluation.	Agreed. <ul style="list-style-type: none"> <li>The installed nose wheel mudguard (fender) allowed the occurrence of braking effect of nose landing gear due to boar stuck on it.</li> </ul>
4. Safety Action		Proposed new safety action as follows: <ul style="list-style-type: none"> <li>The operator issued Quality Notice Number FU24-950-QN/21/VIII/32-00/2020 to prohibit the installation of nose wheel mudguard (fender) on their Fletcher Fu29-950.</li> </ul>	Safety action after the PK-PNZ occurrence	Agreed. PT. Sinar Mas Super Air issued Quality Notice No. FU24-950-QN/21/VIII/32-00/2020, dated 11 August 2020 regarding the prohibition of nose wheel mudguard (fender) installation on Fletcher Fu29-950 fleet

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