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Final Investigation Report of Propeller strike while landing incident to M/s National Flying Training Institute, Diamond DA 40CS aircraft, VT-NFC at Gondia Airport on 23.11.2021

GOVERNMENT OF INDIA
OFFICE OF DY. DIRECTOR GENERAL CIVIL AVIATION (WESTERN REGION)
INTEGRATED OPERATIONAL OFFICE COMPLEX, SAHAR ROAD
VILE PARLE (E), MUMBAI-400099

FOREWARD

This document has been prepared based upon the evidences collected during the investigation, opinions obtained from the experts and laboratory examination. The investigation has been carried out in accordance with Annex 13 to the Convention on International Civil Aviation and under Rule 13(1) of The Aircraft (Investigation of Accidents and Incidents) Rules 2017. The investigation is conducted not to apportion blame or to assess individual or collective responsibility. The sole objective is to draw lessons from this incident which may help to prevent such future incidents.

ABBREVIATIONS

CFI	Chief Flying Instructor
ATC	Air Traffic Controller
R/T	Radio Telephony
AME	Aircraft Maintenance Engineer
RWY	Runway
AVGAS	Aviation Gasoline
SAE	Society of Automotive Engineers
DI	Daily Inspection
ESR	Engineering Statistics Report
RPM	Rotation Per Minute
METAR	Meteorological Aerodrome Report
ATR	Action Taken Report
PAPI	Precision Approach Path Indicator
VFR	Visual Flight Rules
DFDR	Digital Flight Data Recorder
PFD	Primary Flight Display
SOAP	Spectrometric Oil Analysis Program
OEM	Original Equipment Manufacturer
AAI	Airport Authority of India
SOP	Standard Operating Procedure
FTPR	Flying Trainee's Progress Report
FTO	Flying Training Organization
CRS	Certificate of Release to Service
IR	Instrument Rating
NFTI	National Flying Training Institute
FRTOL –R	Flight Radio Telephone Operator License. Restricted
ARC	Airworthiness Review Certificate
ROD	Rate of Descent

Final Investigation Report of Propeller strike while landing incident to M/s National Flying Training Institute, Diamond DA 40CS aircraft, VT-NFC on 23.11.2021 at Gondia Airport.

General Information

1.	**Aircraft**	**Type**	Diamond DA 40 CS
		Nationality	Indian
		Registration	VT-NFC
2.	**Owner and Operator**	M/s NFTI, Gondia	
3.	**Pilot In Command**	SPL holder	
	Extent of Injuries	Nil	
4.	**Date & Time of Occurrence**	23.11.2021, 14:25hrs IST	
5.	**Place of Incident**	Gondia Airport	
6.	**Geographical location of site**	21.5228° N, 80.2907° E	
7.	**Last point of departure**	Gondia airport	
8.	**Intended place of landing**	Gondia airport	
9.	**No of passengers on board**	Nil	
10.	**Type of operation**	Flying training	
11.	**Phase of Operation**	Landing	
12.	**Type of Incident**	Abnormal Runway Contact (ARC)	

SYNOPSIS

On 23.11.2021, M/s NFTI-CAE's Diamond DA 40 CS aircraft VT-NFC was scheduled to depart from Gondia Airport at 14:00hrs IST for solo circuit and landing sortie as per flight plan. Solo flight by the trainee pilot was authorized by Chief Flying Instructor (CFI). On the same day previous to this flight, the trainee pilot had carried out 04 circuit and landings with instructor as part of re-induction after her break period. The trainee was then released for solo circuit and landing. After the pre-flight walk around inspection, the trainee pilot requested Gondia ATC for start-up. The aircraft then took off

for the trainee pilot's solo circuit and landing. The supervision of the solo flight was carried out by the instructor from ATC tower and also through R/T. During the course of landing on RWY 04, the aircraft had initially touched the runway with its nose landing gear. Due to this one-pointer landing, both the propeller blades touched the runway surface and the aircraft then bounced. The aircraft landed back on the runway and taxied on its own power to the bay and made a complete stop. The tips of the propeller sustained an inward curl on each blades. No evidence of fire or smoke was observed on the aircraft. No injury was sustained by the trainee pilot.

The incident was reported by the operator to DGCA, as per the timeline mentioned in CAR Section 5 Series C Part 1.

Director General of Civil Aviation had instituted an investigation into the incident, by appointing an Investigator in Charge, vide DGCA Order: DGCA-15018(19)/8/2021-DAS, dated 22.12.2021 under Rule 13(1) of Aircraft (Investigation of Accidents and Incidents) Rules 2017.

During investigation it is established that incorrect approach procedure and flare technique followed by the trainee pilot led to landing on nose wheel and subsequent propeller strike.

1. FACTUAL INFORMATION

1.1. History of flight

On 23.11.2021, VT-NFC was cleared for flying after the pre-flight inspection carried out by the AME. The aircraft was scheduled to carry out 03 sorties on the day. The initial two sorties were dual sorties. The aircraft took off at 11:10hrs IST and the duration of the sortie was about 01 hour, with 02 landings. The sortie was uneventful and the aircraft landed at Gondia airport at 12:15hrs IST.

The second dual sortie was done by the involved trainee pilot with her instructor. 04 circuits and landings were planned to be performed during the sortie. The aircraft took off at 13:10hrs IST from Gondia airport and completed the planned 04 circuits and landings in 35 minutes. The flight was uneventful and the aircraft landed at 13:45hrs IST. After this sortie, the trainee was briefed and released for solo flying by the instructor.

The aircraft was refueled with 19 and 20 litres of fuel on LH and RH tanks respectively, for its third sortie of the day. After performing the pre-flight walk around inspection, the trainee pilot sought permission from Gondia ATC for startup. Once permission was granted, the aircraft took off from RWY 04. The entire flight was uneventful till the time of landing. While approaching RWY 04 for landing, the trainee pilot selected the flap configuration suitable for landing. Since the trainee pilot felt the approach was high, negative pitch was given through the control stick, to counteract it. With no flare initiated by the trainee pilot, the aircraft touched the runway on its nose landing gear because of the nose down attitude of the aircraft. The touchdown was associated with propeller strikes on the

runway surface and then the aircraft bounced. Meanwhile, the instructor who was monitoring the solo flying from ATC, instructed the trainee pilot through R/T to hold the stick. However, the power being idle was not sufficient to generate lift and thereby aircraft touched back on the runway surface and slowed down. The aircraft taxied with its own power to the hanger and switched off. During the post flight visual inspection carried out by the trainee and the instructor, the damage to both the propeller blade tips was noticed.

1.2. Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor/none	1	Nil	

1.3. Damage to aircraft

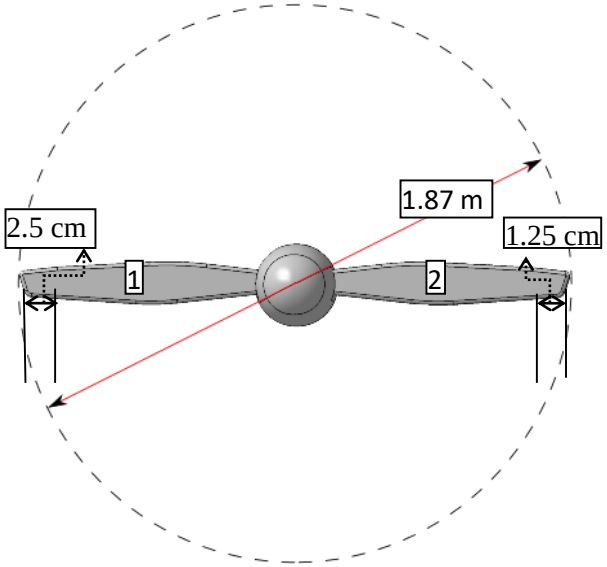

Fig 1: Representing the extent of tip damage on propeller blades

The aircraft while landing at RWY 04, touched the runway initially on its nose landing gear. Due to the nose down attitude of the aircraft, the propeller hit the runway surface while landing. During this impact, the tip of the blades (1 and 2 as shown in fig 1) got curled inside by 2.5cm and 1.25cm respectively. The tail skid was found to be intact with no scratches.

1.4. Other damage:

During landing on RWY 04, the propeller of the aircraft touched the runway thrice, thereby making scratch/cut marks on the runway surface. Fig 2 depicts the marks made on the runway, by the tip of the propeller blades. The consecutive distance between the first, second and the third markings were 82.8 cm and 55.5 cm respectively (refer fig 2). Only a light scrape mark could be observed in the first instance of propeller blade hitting the runway surface. In the second and third instance, the propeller blade tips made significant contact with the runway surface, thereby creating cut marks on

the runway surface. The depth of cut is deeper in the second instance in comparison with the third instance.

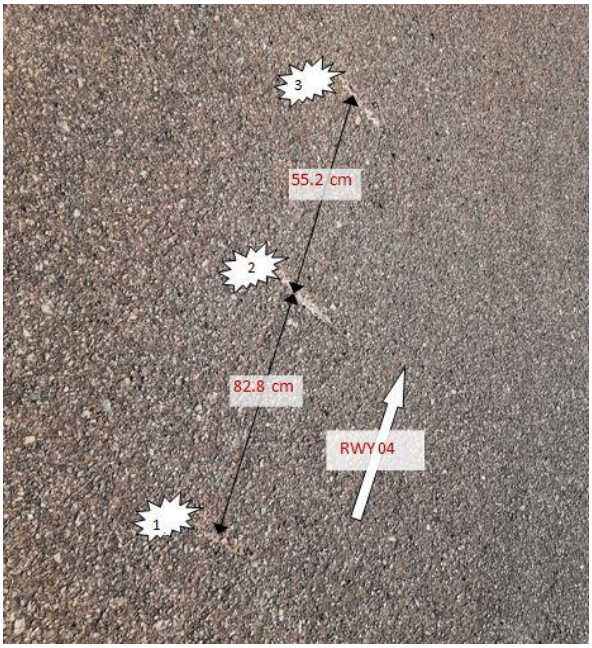

Fig 2: Depicting the propeller strike marks and their spacing on RWY 04

1.5. Personnel information (PIC)

Age	30 yrs 6 months
Gender	Female
Type of License	Student Pilot License
Date of issue of License	16/08/2019
License valid till	15/08/2024
FRTOL-R License validity	28.11.2029
Date of Class I Medical exam	10/12/2020
Class I Medical Validity	09/12/2021
Total Flying experience	168:10 Hrs
Solo Flying	79:15 Hrs
Dual Flying	88:55 Hrs
Total Flying Experience during last 365 days	83:00 Hrs
Total Flying Experience during last 90 days	02:35 Hrs
Total Flying Experience during last 30 days	02:35 Hrs
Total Flying Experience during last 07 days	02:35 Hrs
Total Flying Experience during last 24 hours	02:35 Hrs

Before undertaking the first sortie of the day, the trainee had submitted the self declartion certificate for non consumption of alcohol in compliance to DGCA order no: DGCA-15031/4/2020-DAS dated 02.11.2021 which was inforce due covid pandemic.

1.6. Aircraft information

Diamond DA40 CS is a four seater aircraft with a low-wing configuration, especially used for flying training purpose. The low-wing configuration and its high aspect ratio, renders the aircraft with higher stability and excellent stall recovery attributes. The aircraft is fitted with Lycoming IO-360-M1A fuel injection engine, with AVGAS as its fuel. The fuel tanks are integrated on both the wings, with a storage capacity of 78 litres on either tanks. The engine is lubricated with a wet sump oil system and the oil used was SAE 60 (7.5 litres approximately). The aircraft is fitted with fixed pitch propeller made of aluminum with an acryl lacquer painted finish.

Aircraft details:

Make/Model/Type	: Diamond DA40 CS
Maximum Take-off weight	: 1200 Kg
Maximum Landing weight	: 1150 Kg
Manufacturer	: M/s Diamond Aircraft industries
Year of Manufacture	: 2008
Airframe hours, as on 23.11.2021	: 9388:35 Hrs
Indian ‘C’ of ‘A’ issue date	: 06.04.2009
Indian A.R.C valid till	: 23/12/2021
Airframe hours since last ARC	: 820:05 Hrs

Installed Engine details:

Make	: Lycoming IO-360-M1A
Date of installation	: 07.08.2020
Serial Number	: L-35689-51E
Time since New	: 4913:20 Hrs
Time since overhaul	: 1207:00 Hrs

Installed propeller details:

Make	: MT-Propeller Entwicklung GmbH
Type	: HC-C2YR-1BFP/F7497
Date of installation	: 07.08.2020
Serial Number	: CH45297 B
Time since New	: 6762:15 Hrs
Time since overhaul	: 1966:10 Hrs

On 23.11.2021, Daily Inspection (DI) checks were carried out by an authorised AME and the aircraft was released for service. On the same day, the aircraft had flown two sorties before the incident flight and clocked 2.5 hrs. During the previous two sorties, no snags were reported on the aircraft.

The last major maintenance done on the aircraft was on 20.11.2021 and it was a 100 hrs/06 month's inspection. As part of the same, all the checks were satisfactory and the engine oil was replaced. From the Engineering Statistics Report (ESR), no unscheduled removals were done on the aircraft in the past one year.

From the snag register it was observed that the following significant snags were reported on the aircraft during the past one year and the maintenance actions were carried out accordingly:

Sl. No	Date	Snag Reported	Rectification actions
	18.09.2021	Engine stalled on runway at 1600 RPM during line-up, while slightly increasing the throttle	As a part of rectification, the fuel injectors were replaced. Ground run was carried out. Post ground run, the aircraft was released for service.
	17.11.2021	Pilot reported low idling RPM	During the rectification, a ground run was given and the idling RPM was adjusted accordingly. Aircraft was released for service.

1.7. Meteorological information:

As on date of incident, Birsi Munda Airport, Gondia was managed by M/s Airport Authority of India (AAI), with the ATC being manned by personals of M/s NFTI. No METAR was being published for the airport. However, the ATC was utilizing certain charts and equipment to determine the airport data. As per the data maintained, at 1400hrs IST on the date of incident, the visibility was more than 5000 m, with calm winds and the temperature being registered as 30^0C. As per the Garmin data, there were head winds of 3-4 kts prevailed during the landing phase.

1.8. Aids to Navigation

The aerodrome is equipped with DVOR/DME and NDB. Also the aerodrome is equipped with landing aids such as PAPI (on both RWY 04 and RWY 22) and windsocks.

1.9. Communication

The aircraft was maintaining two-way communication with ATC under tower frequency of 122.175 Mhz. The Gondia airport is controlled by Airport Authority of India, headed by an Airport Director. However, the ATC is being manned by personal of M/s NFTI. R/T communications are recorded and controlled by M/s AAI. The recorded conversation at the last phase of landing between the incident aircraft and ATCO is reproduced below:

Time(IST)	From	To	Radio Transmission
02:22:03	Tower	VT-NFC	Report Finals
02:23:36	VT-NFC	Tower	Turning for Finals
	Tower	VT-NFC	VFC Roger Continue
	VT-NFC	Tower	Will Continue approach, VFC
02:23:59	VT-NFC	Tower	VFC on Finals
	Tower	VT-NFC	VFC Continue approach
	VT-NFC	Tower	Continue VFC
02:24:36	Tower	VT-NFC	Foxtrot Charlie, cleared to land RWY 04
	VT-NFC	Tower	Cleared to land VFC
02:25:37	Tower (Instructor Transmission)	VT-NFC	**Hold Hold Hold…… Hold Hold**
02:26:01	Tower	VT-NFC	VFC vacate Via A

1.10. Aerodrome Information

Birsi Munda Airport is located in the North-East direction at a distance of 16 km from the city of Gondia. The airport is located at an altitude of 303 meters from the sea level. The airport is categorized under Code 'C' and can handle large aircraft like ATR-72. The dimensions of runway is 2135 m x 45 m, with a slope less than 0.5^0. The runway and the taxi strips are laid with bitumen, whereas, concrete is used in other non-operational areas.

1.11. Flight Recorders

The aircraft is not fitted with DFDR or CVR units. However, the aircraft is equipped with a Garmin based software system (G-1000) which logs and stores critical flight and engine data, which are displayed in the PFD. The parameters are recorded at an interval of one second (sampling rate). About 62 parameters can be recorded by the system. The aircraft is not equipped with Radio Altimeter (Radalt), which indicates the exact height of the aircraft from the runway elevation. Hence the elevation of RWY 04 (987.5 ft) was taken as reference to calculate the height of the aircraft from the pressure altitude. The pitch, engine RPM, approach speed and the sink rate of the aircraft against height of aircraft (from 500ft plotted along x-axis) is graphically presented in Fig.3.

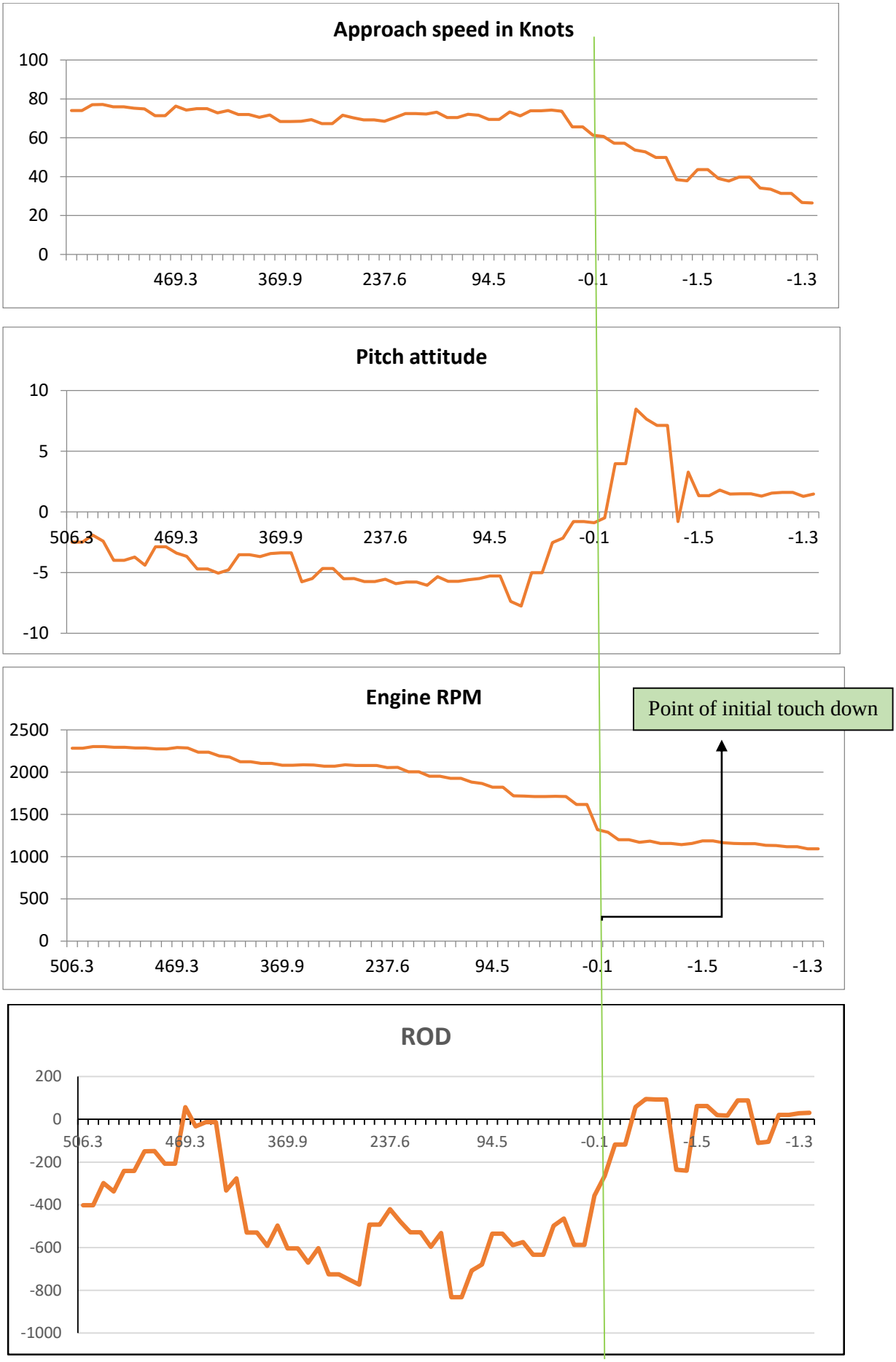

Fig 3: Depicting the pitch attitude, Engine RPM, Approach speed and ROD w.r.t height of A/c from 500ft RA

1.11.1. **Approach Phase till touchdown (from 500 to 0 ft RA):**

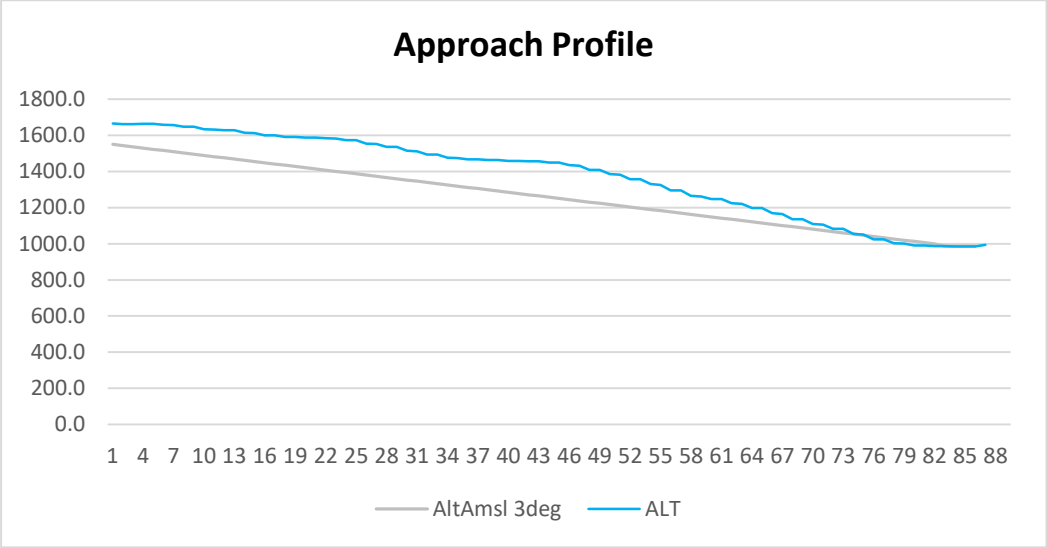

Fig 4: Approach profile path of the aircraft

- The grey line (in fig 4) shows the ideal 3-degree glide path. The blue line is the actual path followed by the aircraft during the approach till touchdown (height in AMSL). The approach angle of the aircraft maintained was higher than the ideal 3-degree glide path.
- The aircraft had maintained an approach speed of 65-77 Kts, gradually from 500 ft(RA)till the point of initial touch down. At the initial touchdown, the approach speed of the aircraft was 65 Kts.
- The aircraft was approaching with a negative pitch till the point of initial touch down and no flaring was initiated for touch down. The pitch inputs were varying through out and reached a maximum negative pitch of -7.75^0 at an altitude of 63.3 ft (above runway surface) Going further, the negative pitch inputs drastically reduced till the point of touchdown. At the touchdown point, the aircraft was in a negative pitch, of -0.8^0.
- At 500 ft (above runway surface), while approaching for landing, the engine had 2300 RPM and it gradually reduced with decrease in altitude. Just prior the point of initial touch down, the engine RPM registered was 1618 units.
- The aircraft was maintaining a higher sink rate in the final approach phase. The sink rate kept increasing above 500ft/min from around 420 ft (above runway surface). And at an altitude of 149ft (above runway surface), it recorded a maximum of 832 ft/min. Almost till touchdown, the aircraft was maintaining high rate of descend.

1.11.2. **After initial touchdown:**

- The engine RPM dropped abruptly from 1618 to 1319 units within a second, just after the initial touch down. This point is considered as the time of propeller strike due to the sudden

drop in rpm. Thereafter the engine RPM started to reduce gradually. Similarly, the aircraft speed also reduced gradually.

- The vertical speed was negative till touchdown and after three seconds of touchdown, the value becomes positive which shows the upward (bounce) movement of the aircraft.
- The pitch input at the point of initial touch down was -0.8^0. After 3 seconds from the point of initial touchdown, positive pitch inputs were again given to the aircraft, upto 8.5^0, for a period of 6 seconds. However, engine rpm was not increasing at this period.
- Headwind of 3-4 kts prevailed during the landing phase and no abrupt heading changes were found registered.

1.12. Wreckage and Impact information

The trainee had landed the aircraft after the aiming point and in the touchdown zone, slightly right from the runway centerline. From the threshold of RWY 04, the initial point of touchdown was around 473 meters, slightly right to centerline of RWY 04. The propeller strike marks were found at a distance of 6 meters, to the right from the runway centerline. No distinct rubber marks made by the tires could be seen on the runway surface.

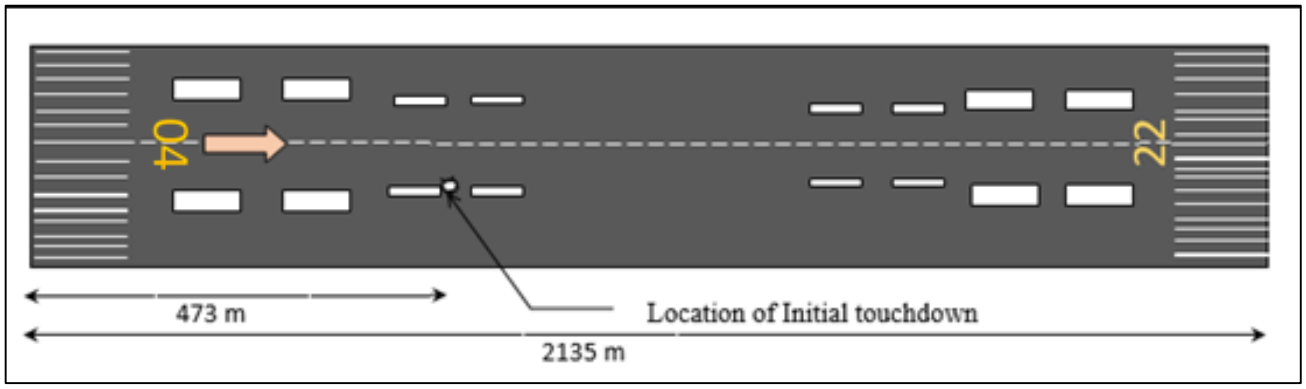

Fig 5: Pictorial Representation of RWY 04/22 locating the point of touchdown

1.13. Medical and pathological information

Nil

1.14. Fire

No evidence of smoke or fire was observed.

1.15. Survival aspects

The incident was suvivable.

1.16. Tests and Research

During the 100 hrs inspection carried out on the aircraft on 20.11.2021, the old engine oil was replaced with new engine oil of about 7.5 litres. The aircraft after the inspection had flown about 8 hrs, till the incident on 23.11.2021. The engine oil which was drained out from the incident aircraft was observed to be highly darkened in colour. Engine oil sample taken from the aircraft was send to an

external agency for SOAP (Spectrometric Oil Analysis Program) analysis. The analysis report revealed the composition of different metal constituents in mg/kg, which were present in the oil as shown in table.1 below.

Iron	7.0	mg/kg
Aluminium	3.0	mg/kg
Copper	5.0	mg/kg
Barium	<1	mg/kg
Boron	<1	mg/kg
Calcium	<1	mg/kg
Cadmium §	<1	mg/kg
Chromium	1.0	mg/kg
Lead	1012.0	mg/kg
Magnesium	<1	mg/kg
Manganese	<1	mg/kg
Molybdenum	<1	mg/kg
Nickel	<1	mg/kg
Phosphorus	8.00	mg/kg

Table 1: The metal composition of oil sample in mg/kg

As per the table, significant proportion of iron and copper along with higher proportion of lead was present in the oil sample. The OEM of the engine was approached for the justification of the alarming proportion of lead accompanied with iron and copper. It was clarified that presence of iron and copper in the oil was within the limits and the higher concentration of lead was due to the internal combustion process.

1.17. Organizational & management information:

M/s NFTI (National Flying Training Institute) was established in 2007 as a joint venture between CAE and Airport Authority of India. The organization is utilizing the facilities at Gondia airport for imparting various flying training to student pilots. The organization is structured under the management of Accountable Manager. The Engineering setup in NFTI is under the approval system of the DGCA and is an ”Approved Maintenance Organization” in CAR – M subpart ‘F’ and an approved “ Continuing Airworthiness Management Organization” under Subpart ‘G’ to cover maintenance and continuing airworthiness activities of aircraft, engine, instruments, radio communication, navigation equipment and battery installed on the aircraft operated by the institute.

1.17.1. **Training and Procedure Manual and SOPs:**

The training and procedure manual (TPM) of the organization has laid down the general requirements to finish the curriculum (including ground classes and flying). Detailed procedures are laid on the flying requirements (hours) on each phase of the training. As per the company SOP being followed at the time of incident (Issue 01, Rev 11 dated 24.12.2019), a trainee pilot who is not concurrent with flying for more than a month had to undertake a dual general/instrument flying sortie and a dual circuit and landing sortie comprising at least 3 landings. Based on the performance in the above two dual sorties, the trainee pilots would be cleared for solo flying.

1.17.2. **Flying Trainee's Progress report (FTPR):**

As per FTPR, the trainee pilot had started flying with the organization from 14.01.2020. In the initial phase of flying, the trainee pilot was showing slow progress in handling the flight and airmanship. After 34:25 hrs of dual flying, the trainee pilot was released for first solo. After 110:20 hrs into the flying training, the trainee pilot had carried out the first solo cross country flight of 3 hrs. After accumulating 165:35 hrs of dual and solo flying as on 08.03.2021, the trainee pilot was unavailable for concurrent flying for the next 7 months and joined back on 22.11.2021. Upon joining on 22.11.2021, the trainee was briefed for Instrument flying and had carried out a dual sortie with the instructor. The next day, i.e on 23.11.2021, the trainee had carried out a dual sortie of Circuit and Landings. Total four landings were carried out during the sortie and in the first landing, the instructor felt that the approach made by the trainee pilot was high, however the same was corrected immediately. Based on overall satisfactory performance of the above two dual sorties (on 22.11.2023 and 23.11.2023), the trainee pilot was released by the instructor for carrying out solo flying (the incident flight), after necessary debriefing.

1.17.3. **Extracts of Pilot Operating handbook and SOP:**

In addition to the Pilot Operating Handbook, the trainee pilots are advised to follow certain SOPs related to basic flying, issued by the operator. Based on the POH and SOPs, the ideal configuration during the approach phase would be:

a. Flaps: Landing Configuration
b. Speed: 58-73 Knots
c. Sink Rate: <500 ft/min

1.18. Additional information

Nil

1.19. New investigation techniques

Nil

2. Analysis

2.1. Operational aspects:

Based on FTPR and the statement of the trainee pilot, it is evident that the trainee pilot was not current with flying for the past 7 months previous to the incident. After the long absence from flying, the trainee pilot had joined back for flying a day prior to the incident date. The procedure of re-induction of the trainee pilot after the prolonged absence was in accordance with the company SOP being used as on date of incident. The trainee pilot had operated two dual sorties before undertaking a solo flying, as per SOP. The approach and landing during the first sortie (I/F) was satisfactory as per the instructor. During the second dual sortie (circuit and landing), one of the approaches was high, the

same was corrected immediately by the trainee pilot and continued for normal landing. All other circuits were found satisfactory. Post landing, the instructor debriefed the trainee and cleared her for solo sortie as per SOP and no additional flying was advised. The incident sortie was trainee pilot's first solo sortie after a gap of more than 07 months. The trainee pilot had a total flying of 02:35 hours only in the last 90days.

From the statement of the trainee pilot, it could be inferred that the flaps were selected for the landing configuration. Below 500ft (RA), the sink rate (reached up to 832 ft/min) and the approach speed (at certain instances up to 77kts) was higher than the prescribed limits of an ideal approach. From the Garmin data, it is evident that the aircraft was subjected to negative pitch, from around 1550ft AMSL till the point of initial touchdown. The approach profile maintained by the trainee pilot was also higher than the ideal 3-degree glide path. Also it is inferred that no flaring was initiated by the trainee pilot prior to touchdown. However, the trainee pilot did not initiate go around procedures though she realized the unstable approach condition.

Due to this nose down attitude of the aircraft, the initial touchdown was on the nose landing gear, accompanied by propeller hitting the ground. After the initial touchdown, the aircraft bounced and the trainee pilot had given a positive pitching attitude (about 7 seconds) to the aircraft. As advised by the instructor through RT, the trainee pilot had held the stick, however the stick was not held firmly by the trainee pilot. The engine power at the instant of touchdown was at idle, and this idle power was not sufficient to maintain the climb after bounce, when the pitching motion was initiated. Hence, due to insufficient power, the bounced aircraft touched back the runway surface and rolled before coming to a complete halt.

Three markings as a result of the propeller strike were found on the runway near the point of first touchdown. No significant dent/markings could be observed in the first instance of propeller touching the runway surface. In the second and third instance, the propeller strikes created significant cut marks on the runway surface. From the propeller tip damage, it could be inferred that during the first instance, the #2 blade (refer fig 1) would have slightly crazed the runway surface. In the second instance, the #1 blade (refer fig 1) made a significant cut on the runway and it is evident by the inward curl of about 2.5 cm at the tip. In the third instance, the #2 blade (refer fig 1) made a less significant contact and the tip got an inward curl of 1.25 cm.

Correlating the statement of the trainee pilot and the instructor with the Garmin data, it is evident that the approach was high and negative pitch inputs were given by the trainee pilot to counteract it. With no flare initiated by the trainee pilot, the aircraft touched the runway on its nose landing gear, accompanied by propeller strikes and then bounced. Subsequent to the bounce the aircraft

landed back on the runway shortly due insufficient power applied and then rolled further towards the bay.

2.2. Maintenance aspects:

The daily inspection checks were carried out on the aircraft before releasing the aircraft for service on 23.11.2021. Prior to the incident flight the aircraft had flown for 2 uneventful sorties accumulating a flying time of 2.5 hrs. The previous major maintenance (100hrs/06 months) inspection on the aircraft was carried out on 21.11.2021. During the inspection, the old engine oil was replenished with 7.5 litres of fresh oil. After the 100hrs/06months inspection, the aircraft had flown around 8 hours till the incident flight. After the incident, during the aircraft inspection it was observed that the drained engine oil was very dark in colour. However, the SOAP report on the same revealed that the percentage of metal constituents of the oil were within the limits prescribed by the engine manufacturer.

From the Engineering Statistics Report, it was understood that no unscheduled removals were carried out on the aircraft. No significant snags which could lead to the incident were found to be reported on the aircraft in the past one year. The aircraft was having a valid ARC as on 23.11.2021. Considering the above, maintenance aspects were not a factor leading to the incident.

2.3. Weather aspects

The weather on the day i.e on 23.11.2021 was conducive for flying and had no role into this incident.

3. CONCLUSION

3.1. Findings

3.1.1. The trainee pilot was not current with flying for the past 7 months before undertaking the solo flight. The trainee pilot was reinducted to flying by giving familiarization flying of two dual sorties, as per the company SOP.

3.1.2. Out of the 4 circuit and landings (dual sortie) carried out prior to incident flight, one of the approach was high, but corrected immediately by the trainee pilot and normal landing carried out. The trainee pilot was briefed by the instructor and then released for solo sortie (circuit and landing) as per SOP. No additional flying was advised by the instructor.

3.1.3. The trainee pilot was in possession of a valid SPL and was medically fit.

3.1.4. The trainee pilot had sufficient rest after the previous day flight.

3.1.5. The trainee had submitted the BA declaration form prior to undertaking the first flight for the day as per the existing guidelines at that period.

3.1.6. The trainee pilot was authorized to fly on the day of incident by the CFI.

3.1.7. The weather on the day of incident was conducive for flying.

3.1.8. The flaps were configured for the landing configuration and the approach speed from 500ft (RA) till touchdown was maintained between 65-77kts.

3.1.9. The aircraft was high during the approach phase and had maintained nose down attitude till touchdown.

3.1.10. The sink rate maintained was high, especially in the last phase of approach.

3.1.11. No flare was initiated by the trainee pilot before touchdown. The initial touchdown was on the nose landing gear which led to propeller hit and bounce.

3.1.12. The instructor, who was monitoring the landing from the ATC, had commanded the trainee pilot to hold the stick after the bounce. However the trainee pilot didn't hold the stick firmly instead increased the pitch attitude.

3.1.13. Since the engine power was in idle, the positive pitch input did not deliver any altitude gain and thus aircraft touched back on the runway shortly after the bounce.

3.1.14. Go-around action was not initiated by the trainee pilot before the touchdown, even though the trainee pilot realized that the approach was high.

3.1.15. The aircraft was airworthy on the day of the incident, with a valid ARC. The daily inspection checks were carried out and found satisfactory, before releasing the aircraft for service.

3.1.16. The aircraft had flown two sorties uneventfully on the day, prior to the incident flight.

3.1.17. The aircraft was subjected to a major maintenance (100 hrs inspection) two days prior to the incident and was released for flying with a valid CRS. Also, the aircraft had flown 8hrs, after the major maintenance.

3.2. Probable Cause of the incident:

Incorrect approach procedure and flare technique followed by the trainee pilot led to touchdown on nose wheel and subsequent propeller strike.

4. Safety Recommendations

Corrective actions as deemed fit by DGCA-Hqrs as per para 3.1.9, 3.1.10, 3.1.11, 3.1.12 and 3.1.14.

DAWN PRADEEB SOBHANAM ALICE
2023.09.08 17:49:28 +05'30'

Dawn Pradeeb S A
(Air Safety Officer)
Member

VINEETH SREEKUMAR
VINEETH SREEKUMAR your signing location here
2023.09.08 17:59:39+05'30'

Vineeth S
(Asst. Director of Air Safety)
Investigator -in- Charge

********** End of Report **********