

This report is prepared by Accident Investigation Commission constituted by Ministry of Culture, Tourism and Civil Aviation, Government of Nepal, in accordance with Civil Aviation (Accident Investigation) Rules, 2024 B.S.

Aircraft Accident Investigation Report

Yeti Airlines Pvt. Ltd
9N-AEQ Twin-Otter DHC-6/310
Near Jumla Airport
on
June 21, 2006



October 2006
Government of Nepal

SYNOPSIS

Date of Accident:

Wednesday 21 June 2006
At 0618 hrs UTC (*)

Place of Accident:

Country : Nepal
Area : 29°16'26"N 08°21'123"E
In the paddy field to the east of the airport
Jumla

Type of flight:

Charter flight from Surkhet to Jumla with
passengers and cargo

Aircraft:

Twin Otter DHC-6-310;
S/N : 708
Registration : 9N-AEQ

Owner:

Laxmi Bank Limited &
Machhapuchhre Bank Limited (As per
C of R Serial No.:125 and File
No.:9(4.138))

Operator:

Yeti Airlines Pvt. Limited

Occupants:

Cockpit crew : 2
Cabin attendant : 1
Passengers : 6
Total : 9

Summary: - The aircraft took off from Surkhet for Jumla at 0549 hrs. Aircraft crashed 0.5 nm east of the airport in the paddy field.

Consequences:-

	Persons			Aircraft and Cargo	Third Party Damage
	Killed	Injured	unhurt		
Crew	3	-	-	Total loss	Paddy field
Passengers(^)	6	-	-		
Third parties	0	-	-		

(^) According to the boarding documents (flight tickets and boarding cards) 6 passengers were on board.

The Commission concluded the probable cause of the accident to be the crew's attempt to make a go-around while close to R/W 09 threshold with a very low circuit altitude and subsequent attempt to turn in a tight circuit with excessive angle of bank that led to a stall. The aircraft subsequently contacted terrain due to insufficient clearance available for effective stall recovery. The quick decisions to change runway added to the crew workload at a critical period which was aggravated by the breakdown of cockpit discipline which also prevented timely intervention by the Pilot-Not-Flying to the continuous stall warning. The other contributory factors leading to the accident were 1) Violation of company Standard Operating Procedures 2) Insufficient monitoring of its flight training program and line operations by Yeti management 3) Inadequate oversight of Yeti Airlines by CAAN

(*) The time given in this report is in universal coordinated time (UTC). Add 5 hours and forty five minutes to obtain time for Nepal.

COMPOSITION OF THE INVESTIGATION COMMISSION

Composition of the Investigation Commission

By the decision of Government of Nepal dated 21 June 2006, the Accident Investigation Commission was setup comprising of the following:

Mr. Dron Raj Regmi, Deputy Attorney General Office of The Attorney General of Nepal	Chairman
Brig.Gen. (Retd.) Dr. K.B. Shrestha	Member
Mr. Y.P. Juharchan, Chief Pilot, Nepal Airlines Corporation	Member
Mr. Upendra Lal Shrestha, Quality Assurance Engineer Nepal Airlines Corporation	Member
Mr. Medini Prasad Sharma, Joint Secretary Ministry of Culture, Tourism and Civil Aviation	Member - Secretary

The Commission also sought and used the expertise of the following individuals:

1. Mr. Kumar Prasad Upadhayay Chalise, Airworthiness
2. Mr. Sudhir Kumar Chaudhary, Air Traffic Service, CAAN
3. Mr. Mukul Mishra, Aviation Safety, CAAN

CONTENTS

SYNOPSIS.....	1
1. FACTUAL INFORMATION.....	4
1.1 History of Flight.....	4
1.2 Injuries to Persons	4
1.3 Damage to Aircraft.....	4
1.4. Other Damage.....	4
1.5 Personal Information.....	5
1.6 Aircraft Information.....	5
1.7 Meteorological Information.....	6
1.8 Aids to Navigation.....	6
1.9 Communications.....	7
1.10 Aerodrome and Ground Facilities.....	7
1.11 Flight Recorders.....	8
1.12 Wreckage and Impact Information.....	8
1.13 Medical and Pathological Information.....	10
1.14 Fire.....	11
1.15 Survival Aspects.....	11
1.16 Tests and Research.....	12
1.17 Organizational and Management Information.....	12
1.18 Additional Information	12
2. ANALYSIS.....	14
2.1 Witness Statements	14
2.2 Procedure of Jumla Airport.....	15
2.3 Cockpit Discipline for Flying to STOL fields	15
2.4 Role of Training	16
2.5 Role of Yeti Airlines Flight Safety and Management.....	17
2.6 CRM Training at Yeti Airlines.....	19
2.7 Twin Otter Performance	19
2.8 Instrument and Power Plants	20
2.9 Aerodrome Flight Information Service (AFIS)	20
2.10 Safety Oversight system by Civil Aviation-Aviation Safety Department ..	21
3. CONCLUSIONS... ..	22
3.1 Findings	22
3.2 Probable Cause.....	23
4. SAFETY RECOMMENDATIONS	24
5. ABBREVIATION	25
6. APPENDICES.....	26

1. FACTUAL INFORMATION

1.1 History of the flight.

On Wednesday, 21 June 2006, a Twin Otter DHC 6-310 aircraft, operated by Yeti Airlines, with registration number 9N-AEQ, departed from Surkhet at 05:49 UTC on a domestic charter flight to Jumla with 6 passengers, 941 kgs. of cargo including food grains and three crew members on board. The total take off weight of aircraft was 12,499 lbs. which included 1400 pounds of fuel.

The weather report at Jumla at that time was fair with bright sunshine and north easterly 02 knots wind. The wind direction had changed at the time of take off from south westerly.

At 0553 UTC the aircraft left Surkhet valley and established contact with Nepalgunj Tower as per normal procedure. At 0604 UTC the aircraft reported 'Virgin Pass', one of the reporting points en-route to Jumla.

At 0610 UTC the aircraft established contact with Jumla Information and received weather information and Runway 27 for landing. At 0614 UTC wind was 240/04 kts and he decided to use R/W 09 and reported turning final at 0616 UTC. The aircraft appeared on final approach with high speed. The Captain carried out missed approach without informing Jumla control tower. He coordinated his position and intention to use Runway 27 with the pilot of the aircraft 9N-AHR operated by Sita Air which was to land 07 minutes behind him. 9N-AHR aircraft had also requested Jumla tower for Runway 09 to land. The Captain flew 9N-AEQ aircraft over to the right of Jumla control tower, while executing the missed approach and headed towards a hill. The Captain then made a sharp left turn with a high bank angle with an intention to land on Runway 27 while informing to vacate the runway for trailing 9N-AHR aircraft. During this process the aircraft lost speed as well as altitude considerably and hit the paddy field at 0618 UTC to the east of the airport and bounced up and traversed further 200 feet approximately or so ultimately hitting a terrace, cart wheeled came to rest turning 180 degrees with tail section twisted. It instantly caught fire and all 09 occupants died in the resulting fire.

1.2 Injuries to persons.

Injuries	Crew	Passenger	Others
Fatal	3	6	X
Serious	X	X	X
Minor/None	X	X	X

1.3 Damage to aircraft.

The aircraft was completely destroyed.

1.4 Other damage

The rice crop on the field for about 6000 sq. ft. was grazed at places by the impacts of the traversing aircraft.

1.5 Personnel information:

Crew information

1.5.1 Pilot-in-Command

Male

Date of Birth: 17th May 1963

Nationality: Nepalese

Type of License: ATPL #096 (A)

The Captain had previously been involved in three incidents which involved

1. Wingtip damage during taxi at Lukla
2. Safely landed at Nepaljung paddy field due to fuel exhaustion.
3. Runway over-run at Jomsom

However, there was no record of his involvement in any past accident

1.5.2 First Officer

Male

Date of Birth: 01st Sept. 1969

Nationality: Nepalese

Type of License: CPL # 276 (A)

There was no record of his involvement in any past accident or incident

1.5.3 Cabin Attendant

Male

Date of Birth : 23 December 1979

Nationality: Nepalese

Date of Appointment : 15 September 1998

Training: Cabin Crew Training

(Details in Appendix A1)

1.6 Aircraft information:

1.6.1 General

The accident aircraft, 9N-AEQ, was DHC 6/310, serial No. 708 manufactured in 1980. It was acquired by Yeti Airlines in 1998. At the time of the accident, the aircraft had 23392 hours and 36092 cycles since new and was registered to Laxmi bank Limited and Machhapuchre bank Limited and was being operated by Yeti Airlines Pvt. Ltd. The investigation determined that flight 592 was within the maximum takeoff weight applicable to the DHC-6/300 (12,500 pounds) and center of gravity limitations for the calculated takeoff weight (9.3 to 15.4 percent mean aerodynamic chord).

1.6.2 Engines

Both engines were Pratt & Whitney (P&W) PT6A-27s. Engine No. 1, serial number (S/N) PCE 50242, had accumulated 22017 hours since new and 33640 cycles since new. Since last overhaul, engine No. 1 had accumulated 3095 hours and 6540 cycles. The engine was installed on 9N-AEQ on April 15, 2006, and its overhaul was performed by Dallas Airmotive on 17th May 2002.

Engine No. 2, S/N PCE PG0125, had accumulated 6971 hours since new and 14473 cycles since new. Since last overhaul, engine No. 2 had accumulated 3287 hours and 6650 cycles. This engine was installed on 9N-AEQ on March 25, 2004.

(Details in Appendix A2)

1.6.3 Mass and Centre of Gravity

As per Twin Otter Manual

Maximum Take Off Weight: 12,500 lbs

Maximum Landing Weight: 12,300 lbs

Take Off CG Range

Forward
25% MAC at 12,500 lbs

Aft
36% MAC at all weights

Landing CG Range

Forward
25% MAC at 12,300 lbs

Aft
36% MAC at all weights

As per the Load & Trim Sheet document, Take Off and Landing Mass & Center of Gravity were within limits which are as follow.

Take Off CG Range for 12,499 lbs: 28.20%

Landing CG Range for 12,199 lbs: 28.10%

(Details in Appendix A3)

1.6.4 Type of Fuel

Jet-A1 fuel was used as specified by the Approved Flight Manual.

1.7 Meteorological information:

Weather at Jumla as reported by tower:

06:10 UTC -wind 240⁰ 04 knots and fair weather

06:13 UTC -QNH 1014, Wind westerly 04

06:14 UTC - variable light wind, north-easterly light

06:15 UTC - North-easterly light, QNH 1014

1.8 Aids to navigation.

Jumla airport is equipped with NDB as an aid to navigation and was in operating condition. Usage of GPS is mandatory in Nepal as a secondary navigation.

1.9 Communications.

HF and VHF equipment were operating in normal condition at the time of accident. However, VHF communications recording system was unserviceable. Tower communication with 9N-AEQ before entering Jumla valley was cutting out due to terrain but was clear once the aircraft entered the Jumla valley.

1.10 Aerodrome information.

Jumla airport is located in the mountainous region of western Nepal in Jumla district at an elevation of 7700 ft. This airport is surrounded by hills on its Northern and Southern sides leaving narrow gaps toward Eastern and Western sides which are used for landing and take off. This airport is used mostly by Twin Otter and Do-228 aircrafts and apron has the capacity of 5 Twin Otters. Apron is connected with the runway by a Taxiway. Runway surface is paved with the length of 2200 ft and 09 and 27 as its designations. The runway 09 is used for the landing during the light and easterly wind and most of the time runway 27 is used for takeoff and landing considering the geographical surrounding and westerly wind that flows by the afternoon. Both departing and landing aircrafts are visible from the tower in clear weather.

1.10.1 Tower Facilities

Jumla airport has a well established terminal building together with a tower fenced by Chain-Link. The tower is equipped with two - man console that has VHF radio for air - ground communication, HF radio for ground - ground communication, anemometer set, QNH and Temperature measuring facilities. VHF communications recorder was out of order at the time of accident.

Aerodrome Data:-

1. ELEVATION	-	7700 FT
2. R/W LENGTH	-	2200 FT
3. TYPE OF SURFACE	-	PAVED
4. R/W DIRECTION	-	09/27
5. TAKE-OFF R/W	-	27 PREFERABLE.
6. LANDING R/W	-	09/27
7. GRADIENT	-	1 ⁰ UP SLOPE TO R/W 09 AND DOWN 27
8. LIMITATION		
♦ VISIBILITY	-	MINIMUM 5000 M
♦ CEILING	-	MINIMUM 1500 FT.
♦ TAILWIND COMPONENT	-	MAXIMUM 10 KTS
♦ CROSSWIND COMPONENT	-	MAXIMUM 15 KTS

(Details in Appendix A4)

1.10.2 Aerodrome Flight Information Service (AFIS)

Aerodrome Flight Information Service at Jumla airport is provided by Civil Aviation Authority of Nepal (CAAN). The airport is located in the Nepalgunj sector of Kathmandu Flight Information Region (VNSM FIR) and is an Aerodrome Flight Information Service (AFIS) category of aerodrome where pilots are required to decide themselves the actions to be taken (such as selection of runway etc.) and maintaining their own separation. Following services are provided by the Tower to flights:

- ◆ Essential information including:
 - * Traffic information;
 - * Current weather information;
 - * Essential aerodrome information;
 - * Any other pertinent information useful for the safe conduct of flight.
- ◆ Alerting Service – Serve as a post to assist the aircraft in need of search and rescue.

Aerodrome Flight Information Service (AFIS) category of aerodromes like Jumla does not have ATS procedure such as Missed Approach Procedure, Departure and Arrival Procedures etc.

1.10.3 ATS personnel

According to the approved organization chart for Jumla airport, 9th and 7th level staffs are supposed to man the tower for providing flight information service. However, a 6th level staff, who had been trained as an Airport Assistance (AS), was on duty in the Tower at the time of accident.

(Details in Appendix A5)

1.11 Flight recorders

Flight data recorder is not required in Twin Otter aircraft operating in Nepal. Cockpit Voice Recorder (CVR) was fitted and recovered from the aircraft. The CVR was taken to DGCA India, Flight Recorder Laboratory for read out and the obtained information was used as an aid for investigation of this accident. The DGCA, India report commented that though the physical condition of the tape was no good, the quality of recording was "not so intelligible as to make out the clear transcript". The Laboratory also commented on the possible reason for no-so-good quality of recording to be as lack of following Component Maintenance Manual practices in timely changing the recording medium, i.e., tape and spool assembly.

(Details in Appendix A6)

1.12 Wreckage and impact information

The first impact of the aircraft was on an edge of a terrace on the northern side of the paddy field with the tip of its left wing and the aircraft then bounced few times and slid over the field for about 200 feet. In this process the aircraft structure began to disintegrate and parts began to detach. Finally the nose hit a terrace which had a big stone, in a nose down position and the aircraft made a complete somersault and stopped with tail facing forward.

The final impact on the terrace prior to somersault was the most severe one causing fatal injuries to the crew and passengers. The bulk of the wreckage consisting of cockpit, passenger cabin and tail remained there in an upturned position. The aircraft cabin, and fuselage caught fire immediately leaving behind the detached tail portion.

Coordinates of crash site

Latitude : 29⁰16' 26"N
Longitude: 08⁰21'123"E
Bearing : 080 degrees from Jumla airfield.

Crash area is terraced paddy field, about 1.5x0.8 Km and at an elevation of 7700 ft MSL and lies between two sharply rising hills and about 0.5 km outside the chain - link fenced of airport perimeter. There is a stream flowing on the northern side and from there the ground rises sharply and then continues as gently sloping terrace rice field. The gentle slope also continues from the airport on this area and beyond this lies the part of northern hill. There are 2-storied houses on the southern edge of the area.

(Details in Appendix A7)

1.12.1 Cockpit

The Cockpit was found in disintegrated and burnt out condition. However some of the engine control switches positions and other instrument indicators positions were observed as follows:

- ◆ Left Engine Power Lever was at IDLE position
- ◆ Left Engine Propeller Control Lever was at FEATHER position
- ◆ Left Engine Fuel Lever was at ON position
- ◆ AFT Fuel Boost Pump Switch was at OFF position
- ◆ Left Engine Fire Handle was at PULLED condition
- ◆ Left Engine Emergency Fuel Shut Off Valve was at NORMAL position
- ◆ Left engine Oil Pressure Indicator at Positive Pressure Indication
- ◆ Right Engine Power Lever was at little advanced from IDLE position
- ◆ Right Engine Propeller Lever was at FULL FINE position
- ◆ Right Engine Fuel Lever was at ON position
- ◆ Right Engine Fuel Flow Indicator at Positive fuel Flow Indication'
- ◆ Right engine Oil Pressure Indicator at position pressure indication.
- ◆ Flap Lever was at ZERO Flap position
- ◆ Fuel Selection Switch at NORMAL position
- ◆ Landing Light Switch was at OFF position
- ◆ Both Fuel Quantity Indicator at positive Indication

1.12.2 Both engines Fuel Flow Indicators & Oil Pressure Indicators

The both engines Fuel Flow Indicators were observed with the fuel flow indications of more than 100 lb/Hr. Similarly, both engines Oil Pressure Indicators were observed the oil pressure indication of around 80 PSI. These indicated values can be considered as NORMAL at that phase of flight.

Normally, these indicators show ZERO indication at the event of power interruption.

The observed indications may be caused by mechanical failure of the respective indicators due to the impact force and the indicator's arm might have either stuck up at the engine operating conditions at the time of impact or displaced position from the indicating position at that time.

1.12.3 Fuel Quantity Indicators

The Fuel Quantity Indicator for the AFT Tank was observed with the fuel quantity indication of around 520 Pounds whereas the Fuel Quantity Indicator for the FWD Tank was observed with the fuel quantity indication of around 600 Pounds.

1.12.4 Passenger Cabin

The Passenger Cabin was completely burnt out and nothing was left.

The Flap Actuator was found in completely burnt out condition without any clue about the Actuator Rod End position.

1.12.5 Right Engine with Propeller

The engine was found detached from the wing nacelle with its Accessories Gear Box sheared off. Its propeller was found in FEATHERED condition and had got its blades bent in opposite direction to its rotation. The power section casing has got some damages that might have caused by either combination or individual effect of engine drop impact and the powered propeller stoppage.

1.12.6 Left Engine with Propeller

The engine was found detached from the wing nacelle with its Accessories Gear Box sheared off. Its propeller was found in FINE condition and had got its blades bent in opposite direction to its rotation. The power section casing has got some damages that might have been caused by either combination or individual effect of engine drop impact at exhaust nozzle and the powered propeller stoppage.

1.12.7 Right Hand Wing Assembly

The Right Hand Wing Assembly was found detached and in downright position with its lower Nacelle Cowling detached from the nacelle. Its wing tip had dent. There were no flaps attached to the wing structure.

1.12.8 Left Hand Wing Assembly

The Left Hand Wing Assembly was found detached and in upside down position with its nacelle structure completely in disintegrated condition. The fuselage side of the wing assembly was completely burnt out. The left Wing Tip side was found in

severely damaged condition. There were no flaps and aileron attached to the wing structure.

1.13 Medical and pathological information.

The bodies of crew were recovered from the cockpit while those of the six passengers as well as the cabin attendant were recovered from the cabin compartment in a grossly damaged, mud-covered and burnt state.

Post mortem examination of passengers was done at Jumla Hospital while those of the crew were done at Kathmandu Autopsy Centre, Forensic Medicine Department, Tribhuvan University Teaching Hospital.

Post mortem examinations of the passengers were only external. There were severe direct flame burn to the extent of 90 % to 95 % and also destruction of the muscles. All the bodies had been blackened, skin peeled and limbs contracted. There were decelerative blunt force injuries to the head and chest but no dismemberment of any part of limb or body were found.

Post mortem examination of crew were done in Kathmandu Autopsy Centre, Department of Forensic Medicine, Institute of Medicine, Kathmandu There were first to third degree extensive flame burn covering 80 to 90 % of the body with singeing of the hairs, blistering and peeling of the skin and cooked muscles of the limbs in some. There were multiple abrasions, contusions, lacerations and avulsions and fractures of the limb bones. There were cranio-cerebral injuries. The Captain had a horizontally placed fracture of the skull extending right to left post-auricular region in the occiput, and co-pilot had multiple fractures in the left temporo-parietal skull exposing the lacerated lobes. As for thoraco-abdominal injuries, there were multiple bilateral rib fractures, horizontal mid sternum fractures, bilateral haemo-thorax and contusions on the posterior aspect of both lungs in Captain and Co-pilot. Co-pilot also had laceration in left half of the diaphragm with haemo-peritoneum.

The Cabin attendant autopsy showed no fracture in the skull or ribs. There was horizontal mid-sternum fracture with retro-sternal haematoma. Also extensive amount of soot particles was found in the pharynx, trachea and both bronchi thus indicating that he had not died in the impact immediately.

(Details in Appendix A8)

1.14 Fire.

Fire occurred immediately after the final impact where the aircraft came to a rest due to the ignition of the fuel spillage by failure of fuel tank cells. Within minutes some airport perimeter security personnel reached the site and tried to put out the fire by throwing water. Unable to extinguish fire in this manner they then threw mud on the fire which finally was extinguished. These policemen then recovered the dead bodies of Captain and Co-pilot and others from the wreckage. By the time fire had been put out, the aircraft structure had been completely consumed by fire except the tail section.

1.15 Survival aspects

The aircraft traversed about 200 feet approximately bouncing and sliding before it came to a complete halt after somersault. The decelerative force at the final impact prior to somersault of the aircraft was severe enough to cause fatal injuries. Captain and Co-pilot died instantly from the blunt injuries causing multiple internal injuries. Hence, the accident appeared to be an un-survivable one. Though the Captain and Co-pilot died instantly, cabin attendant appeared to have survived for some time as there was extensive amount of soot particles in the pharynx, trachea and both bronchi. As there were multiple impacts and finally somersault of the aircraft before coming to a stop, the injuries were incongruous.

Attempts to rescue the passengers from the burning wreckage were hindered by the fire which was fought with wet mud from the fields by security personnel from a nearby post and the locals. There was no evidence that fire extinguishers were used that is available at the airport.

1.16 Tests and research.

Some of the Primary Flight Instruments and Engine Parameter Indicator were sent to Transportation Safety Board of Canada for determining their status before impact and validating the correctness of parameters reading. The report has not been received by the Commission till date.

1.17 Organizational and management information.

Yeti Airlines:

Yeti Airlines Pvt. Ltd. was established in 1998 under the company Act of Government of Nepal and authorized to operate schedule and charter flights. Its air operator certificate (AOC) no. 037 from the Civil Aviation Authority of Nepal (CAAN) was reviewed on 28th January, 2004. It is operating its flight on both STOL and Non-STOL air fields. Presently it has introduced new flights for hub airports of Nepal with Jet Stream aircrafts. The Airlines has its office at Kalimati Dole, Kathmandu. The airline is headed by the Managing Director and has separate departments like Operation, Flight Safety, and Engineering etc.

The Operations Director, Chief Pilot, Flight Safety Chief have flown significantly more hours in 2005 than the regular line pilots (though remaining within the maximum flight stipulated by CAAN). Thus, they do not have sufficient time to discharge their duties as required by their Operations Manual. The Instructor pilots have also been flying like regular line pilots and therefore lack sufficient time to evaluate their training practices and efficacy.

The airline had earlier lost a DHC-6 Twin Otter, 9N-AFD in 2004 enroute to Lukla. Another Yeti Airlines DHC-6/300 Twin Otter was involved in an accident in Bajura soon after the 9N-AEQ Jumla crash in July 2006.

CAAN:

The oversight of Nepalese air operators is conducted by the Aviation Safety Department (ASD) of CAAN. The Flight Operations Division (FOD) within ASD is responsible for the oversight of Operations of air operators which includes conducting regular audits.

Records from Yeti Airlines show that the Chief of FOD and another flight operations inspector have also been flying for Yeti Airlines. The Chief FOD has flown about 300 hours as Captain on SAAB 340B in 2005 while the flight operations inspector has flown about 100 hours as F/O on the DHC-6 fleet. Thus, regular flying for an operator by CAAN-FOD personnel has the potential for influencing their evaluation to exercise critical judgment on that particular operator necessary for effective oversight of Operations. Obviously, this would also reduce the time available to them for necessary oversight of other operators.

1.18 Additional information

The following documents were studied by the Commission:-

Oversight Audit of Yeti Airlines, Organization Chart and Functioning of CAAN-Aviation Safety Department, Flight duties of Yeti Airline Management Personnel (including Operations Director, Chief Pilot, Flight Safety Chief, Instructor Pilots, line pilots etc.) Yeti Airlines' Standard Operating Procedures, Aircraft Registration Certificate, Certificate of Airworthiness.

The studies indicated inadequate surveillance of line operations by Yeti management and exercise of Safety Oversight functions by Civil Aviation Authority of Nepal.

(Details in Appendix A9)

2. ANALYSIS

At 0544 UTC 9N-AEQ, a DHC-6/310 (Twin-Otter), requested Surkhet tower for starting clearance for Jumla. Acknowledging the request Surkhet tower provided wind information and QNH settings. At 0547 UTC the flight proceeded to request taxi clearance. In the CVR recording inter-cockpit crew communication indicated an altercation between the P-I-C and the F/O during the taxi about the charging of onboard battery used for starting the engine. It appeared that the F/O had not followed the proper procedure for charging the battery. The aircraft became airborne at 0549 UTC and was instructed by tower to report set course. The flight crew then reported leaving the Surkhet valley while continuing climb at 0552 UTC and estimate for Jumla was given as 0615 UTC. At 0553 UTC the crew contacted Nepalgunj and reported leaving Surkhet valley while climbing to 6000 ft and was instructed to report Virgin pass, a compulsory reporting point 55 miles north of Nepalgunj.

At 0604 UTC the crew reported crossing Virgin Pass at 11000 ft and was instructed to contact Jumla tower. The first attempt to contact Jumla tower was made at 0609 UTC without any response from Jumla. The subsequent attempt was responded to at 0610 UTC by Jumla tower and was informed about the flight entering Jumla valley descending from 10000 ft. The tower then instructed 9N-AEQ to report downwind for runway 27 while providing wind information as 240/04 knots. At 0614 UTC Jumla tower was called again by the crew to confirm the wind direction. The Jumla tower then informed wind changing from north-westerly to easterly. Since the wind had changed directions the crew at 0615 UTC indicated their intention to land on R/W 09. The crew reported turning for final for Runway 09 at 0616 UTC and soon after reported final. At this the tower commented that the crew had not intimated their intention of landing at R/W 09.

It appears that the crew had intended to land at R/W 27 based on the earlier wind information and was proceeding accordingly having some excess speed. However, on receiving the latest wind information the captain decided to land on R/W 09. But as 9N-AEQ had approached very close to R/W 09, the crew didn't have enough time and distance to reduce speed quickly enough for making the approach safely. The radio communication between 9N-AEQ and a following aircraft, a Do-228, 9N-AHR, indicated that the crew realized their high speed and therefore decided to make a go-around abruptly. At the same time the crew informed 9N-AHR of its higher speed for the approach and offered to expedite clearing the runway for her. The CVR recording indicated the stall warning for about 14 seconds before impact at 0618 UTC. The crew could be clearly heard yelling in anticipation of the imminent impact a few seconds before impact therefore pilot's incapacitation could not have been a factor.

(Details in Appendix A10)

2.1 Witness statements:

The prime witness, an airport security personnel, who was on the roof of the tower, stated that the aircraft veered to the right of the runway of the tower and "barely missing the tower" which is about 60 ft tall. He then saw the aircraft bank and turn left again missing

a ridge located about 800m from the tower. Then he appeared to make a steep turn while increasing the bank (more than 50 degrees) before impacting the rice fields.

Another witness, an airport security personnel too, who was on the left side of final R/W 27 states: " The first impact of the aircraft was on the edge of terrace on the northern side of the field with its left wing tip and then bounced few times and sliding over the field about 100 m. Finally it hit terrace which had a big stone and made a complete somersault with the tail facing forward"

2.2 Procedure for Jumla Airport:

The pre-landing checklist, which contains missed approach point briefing, is normally to be performed after entering the Jumla valley at about 6 miles from the airport. Then the Final landing checklist while intending to land on R/W 09 is to be performed on long final. The procedure for missed approach to R/W 09 Jumla Airport contained in the Yeti Airlines SOP for STOL airports requires initiation "as early as possible preferably at or above 8000 ft". Thus the decision to go around should be taken about one mile from the threshold. The SOP further states that for go around "It might require proceeding beyond the gorge" which could add a bit of uncertainty to the crew's mindset.

In the case 9N-AEQ, the readout of pre-landing checklist could not be heard in the CVR play back when the flight had neared the position where it should have been done. It appears that the crew had initially intended to land at R/W 27 based on the earlier wind information and was proceeding accordingly having some excess speed if R/W 09 was to be used. However, on receiving the next wind information the captain appeared to have decided to land on R/W 09 at short notice. But as 9N-AEQ had approached very close to R/W 09 with excess speed, the crew didn't have enough time and distance to reduce speed quickly enough for making the approach safely. Based on a witness' statement who was on the roof of the tower at that time, the aircraft after overshoot initially veered to the right "almost hitting the roof of the tower". As the elevation of Jumla airfield 7700 ft MSL and the height of tower is about 60 ft, the aircraft during overshoot had descended below 8000 ft in violation of the SOP's instruction about making the go-around decision at or above 8000 ft.

After the overshoot the aircraft veered to the right for about 150 ft before commencing the left turn and the aircraft started to turn left to join base for R/W 27. Due to limited space, additional bank was applied to prevent overshooting the centerline of the R/W 27 for joining final. It also appears that the PIC continued to increase the bank in order to evade hills to his right (NE of the R/W 27) and in that course excessive bank causing stalling speed to further increase. As a result of the steep turn being made the aircraft began to stall and the already reduced ground clearance continued to diminish. However, as no stall recovery maneuver was initiated the aircraft then soon entered complete stall. The aircraft left wing then contacted terrain and owing to inertia the aircraft continued forward and cart wheeled.

(Details in Appendix A11)

2.3 Cockpit discipline for flying:

Checklist compliance:

The Yeti Airlines SOP instructs about the types of checklists to be performed for various stages of flight. But in case of 9N-AEQ, none of the following checklists (1 to 7) from "Twin Otter Pilot Checklist" appear to have been carried out during the different phases of the flight:

1. Pre-Starting
2. After Start
3. Pre-Taxing
4. Pre Take off
5. After-take-off
6. Pre-landing
7. Final landing
8. After landing
9. Shut Down

CVR readout and transcription does not show any indication of any of the checklists being readout or being acknowledged. Thus the crew was not following the company SOP while executing the various stages of flight.

2.3.2 Crew Briefings:

Take-off briefing:

Yeti Airlines SOP Section 5.2.10 requires take-off briefing to be conducted before take-off and comprises of degree of flaps settings, watch and call-outs for any malfunctions of the engines, and action in this regard etc... From the CVR readouts there was no evidence that the briefing was conducted.

Missed Approach Briefing:

Pilot Checklist for Twin Otter to be performed during pre-landing phase requires briefing of Missed Approach Procedure, which again was not found from CVR playback. And also briefing about turning the aircraft within the Jumla valley was also not found.

Standard Calls for abnormal speed, abnormal bank were not heard in CVR playback

2.4 Role of training:

During the Pilot Proficiency Check (PPC) and re-current training stall recovery is one of the components. However, during the last 14 seconds before the impact, during which stall alarm was clearly audible in CVR recording, no indication of coordination between the crew to attempt recovery from stall could be heard.

Another deficiency observed by the Commission was in the area of PPC in Yeti Airlines and perhaps other operators, too. It was observed that the instructor pilot, who checks the proficiency of pilots, comes from the same company thereby causing a conflict of interest that can potentially compromise the purpose behind PPC. The selection process of instructor pilots by the operators must also take into account the past incident/accident history of the aspirant so that pilots with exemplary past records are preferred.

2.5 Role of Yeti Airlines Flight Safety and Management:

Interview conducted with chief of flight safety and chief of operation department indicate that they had no reliable mechanism ensuring checklist compliance by the flight crew. Thus checklist compliance during the various stages of flight by the crew has been based entirely on trust. Review of SOPs is only carried out after the occurrence of any incident or accidents. Thus the organization appear to be reactive rather than pro-active. Also the attitude of the Yeti management in dealing with the crew's violation in punitive way has been detrimental to the safety culture.

The Operations Director, Chief Pilot, Chief of Flight Safety have been flying hours comparable to line pilots and therefore are not able to spare sufficient time to discharge their primary assigned duties. This could be the prime reason why sufficient control is not being exercised on the day to day operations.

(Details in Appendix A12)

2.6 CRM training at Yeti Airlines:

The CAAN-Flight Operations Requirements (FOR) requires the flight crew of AOC holders to attend CRM refresher class once every year. However, the FOR doesn't clarify the scope of the training to be imparted. The existing CRM training program, as mentioned in Yeti Airline Training Manual, 2001, which is approved by CAAN, is limited to a total of 3 hours of class room lectures on topics like:

- Introduction
- Domains for CRM training
- Basic concept of CRM
- Fundamental of CRM
- Components (to be decided during training and to be submitted at the office of Chief of Flight Safety)

However, the fact that CRM training should be based on the active participation of trainees in role playing and simulation rather than on passive listening to lectures, which now is an industry accepted norm, is not being followed by Yeti or perhaps any other operator.

Many important topics like behavioral aspects of different personalities, an important aspect of effective CRM are not being dealt with. The desired aim of the CRM training should be transferring attitudes of openness and assertiveness developed in the training to the operational context.¹ Even though the course material being used by Yeti Airlines in the CRM courses talks of industry accepted strategies like role playing, adherence to Standard Operating Procedures, briefings, video taping these training sessions especially role playing exercises and subsequently analysis by group members and allowing for giving and receiving criticism in a non threatening environment are not being followed, despite the training curriculum and instructors being approved by CAAN.

¹ Edwards, Mary, Human Technologies Consultant., Crew Coordination Problems Persist, Demand New Training Challenges, Flight Safety Foundation Cabin Crew Safety, Vol. 27 No.6, Nov/Dec 1992

It is evident that indoctrination CRM syllabus is being used for class room lectures even for refresher classes. In short, it appears that CRM training is taken as an unavoidable chore to be performed with monotony. Lack of clear guidance from CAAN, in the form of Advisory Circulars/Guidance Material that amplify the regulations to make it easy to comprehend to the target audience also appears to be a major hindrance for the operator to forge ahead meaningfully. Thus, the CRM training requirements by CAAN must provide mandatory inclusion of the topics like²:

- a. Theory and practice in using communication, decision-making, and team building techniques and skills.
- b. Theory and practice in using proper supervision techniques (i.e., captains working with first officers).
- c. Theory and practice in selecting and using interventions needed to correct flying errors made by either pilot, especially during critical phases of flight. These interventions may include, but not be limited to, communication, assertion, decision-making, risk assessment, and situation awareness skills.
- d. Training for check airmen in methods that can be used to enhance the monitoring and challenging functions of both captains and first officers. The check airmen training should include the message that appropriate questioning among pilots is a desirable CRM behavior and part of the corporate safety culture; further, that such questioning is encouraged, and that there will be no negative repercussions for appropriate questioning of one pilot's decision or action by another pilot.
- e. Training for new first officers in performing the role of the pilot monitoring (PM) to establish a positive attitude toward monitoring and challenging errors made by the pilot flying (PF). Training should stress that appropriate questioning is encouraged as a desirable CRM behavior, and that there will be no negative repercussions for appropriate questioning of one pilot's decision or action by another pilot.
- f. Training for captains in giving and receiving challenges of errors. Training should stress that appropriate questioning is encouraged as a desirable CRM behavior, and that there will be no negative repercussions for appropriate questioning of one pilot's decision or action by another pilot.
- g. Factual information about the detrimental effects of fatigue and strategies for avoiding and countering its effects.
- h. Training for crewmembers that identify conditions in which additional vigilance is required, such as holding in icing or near convective activity. Training should emphasize the need for maximum situation awareness and the appropriateness of sterile cockpit discipline, regardless of attitude. Scenario-based flight simulator training in ground taxi operations should emphasize flight crew vigilance in avoiding runway incursions.
- i. Training that identifies appropriate levels of automation to promote situation awareness and effective management of workload.

² Federal Aviation Administration, Advisory Circular AC 120-51E, AFS-210, 1/22/04, Department of Transportation, Washington D.C.

- j. Training for pilots in recognizing cues that indicate lack or loss of situation awareness in themselves and in others, and training in countermeasures to restore that awareness. Training should emphasize the importance of recognizing each pilot's relative experience level, experience in specific duty positions, preparation level, planning level, normal communication style and level, overload state, and fatigue state. Pilots should assess these characteristics actively and continuously, in their fellow crewmembers and in themselves. Training should also emphasize the importance that improper procedures, adverse weather, and abnormal or malfunctioning equipment may have in reducing situation awareness.

2.7 Twin Otter Performance:

Factors affecting the stalls

There are four major factors affecting the stall

- a. Bank
- b. Weight
- c. Centre of Gravity
- d. Turbulence

2.7.1 Aircraft performance during steep turns (High Bank):

As the angle of bank increases, the amount of lift required to sustain a level flight also increases because of increasing load factor. To increase lift to offset the additional load factor the pilot must increase the angle of attack of the airfoil. Therefore in a turn, stall angle is reached at higher speed than the level flight.

From the Stall Speed (knots), power-off Chart for Twin Otter below, and the witness statements that the aircraft was in a steep bank while turning base it can be inferred that the stall speed had increased significantly assuming a 0 degree flap to about 90 knots as shown in tabular form

Stall Speed (knots), power off (Landing weight 12199 lbs)			
Configuration	Angle of Bank		
	0 °	30 °	50
Flap 0 °	73	78.5	91
Flap 10°	67	72	83.
Flap 37.5 °	57.5	61.5	71.

*** In no air condition. Position error correction to indicated speed not done**

(Details in Appendix A13)

2.7.2 Weight and Balance:

Weight affects the stalling speed of an airplane and the stalling speed increases in proportion to the weight as it requires aircraft to be operated at a higher angle of attack to produce the lift needed to support that extra weight. In case of 9N-AEQ, the trim and load sheet shows the takeoff weight loaded is 12499 lb., which is within the maximum takeoff loading limit (12500 lb.).

2.7.3 Centre of Gravity:

The CG outside the allowable limits also affects the stalling speed. Aircraft loaded with far forward CG has a tendency to stall at higher speeds and loaded too aft has tendency for violent stall characteristics. It also causes poor stall characteristics for the stall recovery.

The CG may change due to properly unlaced cargo and it may have effect on stall. The untrained dispatcher at the point of origin of flight may not do supervision for proper lacing of cargo as he is not formally trained.

The load and trim values shown in the sheet is 28.20 for takeoff and 28.10 for landing which are within the aircraft CG limits (25% - 36% MAC).

2.7.4 Turbulence:

An upward vertical gust causes an abrupt increase in angle of attack causing stall at low speeds. The reported wind at the time of accident at Jumla was northerly easterly 02 knots there were no reports of wind by other aircraft flying at time on existence of turbulence.

2.8 Instrument and power plants

The value of indicated parameter of engine instrument indicators, visual examination of the engines and propeller as well as CVR Playback indicate that engines were working (delivering power at selected power) normally before the time of impact

2.8.1 Fire warning alarm was not audible in CVR and there was no such report of fire or smoke on the aircraft before the impact by the witness.

2.8.2 With the nature of the bent of both engine propeller blades in opposite to its rotation, the positive indication of both engine fuel flow indicators and oil pressure indicators, the continuous sound of the engine operation heard in the CVR tape play back and no conversation of the flight crew heard during the CVR play back for any abnormalities of engine operations. It seems that the both engines were in live condition before the impact.

2.8.3 There could be chances that the position of engine control levers and other relevant switches might have been displaced from its original commanded position due to the final impact forces and/or during the rescue operation carried out in the aftermath.

2.8.4 In a situation where every part of aircraft is disintegrated by forces of impacts it is very difficult to set any causes firmly for miss matching of the position of engine control levers in the cockpit with the observed position of the propeller blades.

2.8.5 Analysis of technical log books indicates that the aircraft was maintained and repaired in accordance with approved maintenance schedule.

2.9 Aerodrome Flight information Service (AFIS)

Jumla is an AFIS category of aerodrome situated in the mountainous region where movement of air traffic exceeds 60 flights or more per day (as per data of Jumla flight movement record from April to September 2006). There is a provision of 9th and 7th level staff to provide AFIS. According to record provided by CAAN, it is evident that a 6th level staff, trained as an Airport Assistant (AS), was on duty in the tower at the time of accident. 6th level staff does not mean that he is not able to provide Flight Information Service but the quality of service is inadequate to meet the CAAN requirements.

Similarly Jumla Tower provides Flight Information Service (FIS) only of aerodrome traffic. In such case, pilots are required to decide themselves the action to be taken and maintain their own separation. In existing situation, safety of air traffic might be in jeopardy several times a day due to heavy traffic. Therefore the aerodrome service category needs to be upgraded.

2.10 Safety oversight system by Civil Aviation-Aviation Safety Department:

The manpower of Aviation Safety Department does not seem to have sufficient time to perform safety oversight functions of Nepalese registered air operators, as required by ICAO Annexes. The primary reason for this is increasing number of air operators, variety in fleet types and the limited number of flight operations inspectors (FOIs). Even from these limited number of FOIs, the inspectors are being deputed to perform regular flight duties at various airlines under various pretexts. This may have some influence on their ability to perform critical oversight of the airline operations owing to the conflict of interest introduced. Significant deficiencies were observed in different flight safety documents for Yeti Airlines like SOP, training manual etc. which again are indicative of lack of adequate supervision by CAAN even after they have been approved by CAAN. The lack of sufficient guidance in the form of Advisory Circulars (guidance material) to amplify various FOR requirements is resulting in varying interpretation of regulations. Thus, the Flight Operations Division should also have suitable positions for adequately qualified personnel who can work on the oversight of flight safety documents that carry equal importance.

(Details in Appendix A14)

3. Conclusions

3.1 Findings

1. The pilots were certificated adequately as per CAAN requirements and medically fit for the flight.
2. The crew had had necessary off-duty time required by CAAN regulation. There was no evidence of physiological factors or crew incapacitation that might have affected the flight crew's performance.
3. The aircraft was certificated, equipped, and maintained in accordance with CAAN regulations and approved procedures.
4. There was no evidence of failure of the aircraft's flight controls, systems, structure, or power-plants before the aircraft impacted ground.
5. The aircraft was within the permissible load and trim limits.
6. The weather at Jumla at the time of accident was fair.
7. The aircraft disintegrated after the impact and caught fire.
8. Flight crew members and the passengers died in the impact.
9. The crew frequently changed their decision about the runway to be used and was therefore mentally overloaded at the critical time of landing.
10. Cockpit discipline, including performing various checklist and briefings, was found lacking through out the flight.
11. The lack of crew coordination led to the increase of mental workload to the pilot flying.
12. The crew did not follow the appropriate approach and miss approach procedures that added to the cockpit workload.
13. Altercation between the flight crew before take-off at Surkhet could have contributed to the lackadaisical approach to monitoring of flight by the co-pilot throughout the flight.
14. The decision to make a sharp turn just before landing at a high bank angle caused the aircraft to stall.
15. The Captain continued with the sharp turn to align the aircraft with the R/W 27 centre line for landing while trying to avoid terrain and he did not react to the stall warning due to his fixation.
16. The stalled condition of the aircraft during the sharp turn without sufficient terrain clearance and prompt stall recovery initiation led to terrain contact.
17. Some aspects of Yeti Airline SOP for Jumla airport were ambiguous and this ambiguity had escaped CAAN's scrutiny during approval.
18. The Yeti Airlines flight crew training program did not sufficiently prepare the crew to deal with unplanned emergencies.
19. There was no indication of the co-pilot's objection or comment on the manner in which the overshoot was done.

20. The CAAN approved CRM training program at Yeti Airlines was limited to passive listening to the instructor and did not prepare the crew sufficiently for intervening in case of colleague's omissions or unsafe actions.
21. The Operation Department and Flight Safety Department of Yeti Airlines did not have effective means of monitoring SOP compliance by flight crews during various stages of flight.
22. The Operation Director, Chief of Flight Safety had been performing line flying duties of comparable to that of regular line pilot. Thus, they could not spare sufficient time to perform duties required of their positions.
23. The Jumla tower was understaffed and not manned to the levels required by CAAN.
24. The communication recorder at Jumla airport at the time of accident was unserviceable.
25. The CAAN inspectors oversight function is not sufficient that may lead to various unsafe acts leading to the accident.

3.2 Probable Cause:

The Commission concluded the probable cause of the accident to be the crew's attempt to make a sudden go-around while close to R/W 09 threshold with a very low circuit altitude and subsequent attempt to turn in a tight circuit with excessive angle of bank that led to a stall. The aircraft subsequently contacted terrain due to insufficient clearance available for effective stall recovery. The quick decisions to change runway added to the crew workload at a critical period which was aggravated by the breakdown of cockpit discipline. The other contributory factors leading to the accident were 1) Violation of company Standard Operating Procedures by flight crew 2) Insufficient monitoring of its flight training program and line operations by Yeti management 3) Inadequate oversight of Yeti Airlines by CAAN

4. Safety Recommendations

As a result of investigation, the Commission recommended a review of the following for the improvement of safety.

To Civil Aviation Authority of Nepal:

1. Review of the SOP of all domestic airlines of each airport to remove any ambiguities.
2. The Flight Operations Division within Aviation Safety Department should also be manned by qualified personnel who can be used to perform oversight of flight safety documentation and other non-flight related oversight duties like dangerous goods, manuals etc.
3. The airports where the movement of the air traffic is high for example 60 flights per day ATS procedure should be introduced.
4. ATS personnel to be deputed to remote high traffic airports should be adequately trained to provide AFIS service as required by CAAN regulations.
5. Issue guidance on the restriction of line flying duties by management personnel like Operations Director, Chief Pilot, Flight Safety Chief in order to provide them sufficient time to monitor the safety related job.
6. Review of CAAN/Aviation Safety Department organizational structure, formulation of necessary rules and regulations in order to enhance Aviation Safety.
7. Review the contents and duration of Crew Resources Management (CRM) courses being conducted by operators and issue adequate guidance on the matter especially regarding the training part.
8. Develop a mechanism to verify the compliance of SOPs by the flight crew during various stages of flight
9. While conducting PPC, the designated check pilots must be made to evaluate the effectiveness of training received for unplanned emergencies.

To all Domestic Operators:

1. Review SOPs of different STOL airports to remove any ambiguities and brief pilots accordingly.
2. To put in place a mechanism for the supervision of loading and lashing of cargo.
3. Develop a mechanism to regularly monitor performance of checklists and briefings by crew during flights.
4. Safety management system (SMS) concept, as required by ICAO Annex 6, should be adopted at the earliest.
5. Review the contents and duration of CRM courses and follow CAAN guidance especially regarding the effective way of the training

ABBREVIATION

C of R	=	Certification of Registration
UTC	=	Universal Co-coordinated Time
R/W	=	Runway
CAAN	=	Civil Aviation Authority of Nepal
STOL	=	Short Take Off and Landing
CRM	=	Cockpit Resources Management
ATPL	=	Air Transport Pilot License
CPL	=	Commercial Pilot License
C.G.	=	Centre of Gravity
NDB	=	Non Directional Beacon
GPS	=	Global Positioning System
VHF	=	Very High Frequency
HF	=	High Frequency
CVR	=	Cockpit Voice Recorder
ATS	=	Air Traffic Service
AOC	=	Air Operator Certificate
F/O	=	First Officer
PIC	=	Pilot-in-Command
SOP	=	Standard Operating Procedure
ICAO	=	International Civil Aviation Organization

APPENDICES

1. Details of Crew and License Information	A1
2. Aircraft Details	A2
3. Load and Trim Sheet	A3(1)
4. Passenger and Cargo Manifest	A3(2)
5. Jumla Airport Physical Facilities	A4
6. Jumla Airport Organization Chart	A5
7. CVR Read Out	A6
8. Wreckage and Crash site Photographs	A7(1)
9. 9N-AEQ Wreckage Distribution Map	A7(2)
10. Post Mortem Report	A8
11. Certificate of Airworthiness	A9(1)
12. Ownership Transfer	A9(2)
13. Combined Regulatory Audit (18-20 July 2006)	A9(3)
14. Approach and flight path 9N-AEQ at Jumla	A10
15. Yeti Airlines SOP Jumla	A11
16. Flight Hours of Yeti Management and Line Pilots	A12
17. Twin Otter Stall Speeds (CAS)	A13
18. Safety Oversight by CAAN	A14
19. Accredited Representative Designation by Canada	A15

Detailed Crew License Information**Pilot -In -Command**

Issued By: Civil Aviation Authority of Nepal
 Rating at type: DHC-6/300 as Pilot-in command
 Validity: 30th November 2006
 Total Flying Hours: 11618:50 as of 14th May 2006
 Total Flying Hours as PIC: 8138:35 as of 14th May 2006
 Total Flight Hours on DHC-6/300: 4718:50
 Total Flight Time as P2: 2580:40 (multi engine)
 Total Flight Hours for last 3 months: 90:45
 Total Flight Hours last month (May) : 42:15
 Total Flight Hours current month (June 2006): 30:50
 Total Flight time on same day: 04:15
 Total Landing on same day: 08
 Total operation to Jumla on same day: 0
 Pilot Proficiency Check: Nov. 25th 2005 (DHC-5/300)
 March 2006 (SAAB-340B)-to be submitted within
 first week of June
 Instrument Pilot Proficiency Check: March 2006
 Ground Training: January 2006 (DHC-6/300)
 December 2005 (SAAB-340B)
 Last Medical Class I: May 2006

Co-pilot

Issued By: Civil Aviation Authority of Nepal
 Type Rating : DHC-6/300 (twin otter), Co-pilot
 Validity: 31st October 2006
 Last Medical: October 2005
 Medical Class: 1st Class
 Total Flying Hours: 535:55 (as of 8 Dec. 2005)
 Total Flying Hours on DHC-6/300 01:05 (as of 8 Dec 2005)
 Total Flight Hours on Type: 236:25
 Total Flight Hours for last 3 months: 111:55
 Total Flight Hours last month (May): 54:00
 Total Flight Hours current month (June 2006): 40:15
 Total Flight Time on same day: 04:15
 Ground Training: December 2005
 Last Proficiency Check: Nov. 25th 2005
 Last Medical: Class I October 2005

Aircraft Details

Aircraft Owner : Laxmi Bank Limited & `Machhapuchhre Bank Limited (As per C of R Serial No.:125 and File No.:9(4.138)[Sufficient DOC could not found to support the ownership change]

Operator : Yeti Airlines Pvt. Limited

Manufacturer : De-Havilland Aircraft, Canada

Model : DHC-6/310 [In some paper it is written DHC-6/300]

Number of Engines Installed : Two

Aircraft Serial Number : 708

Date of Manufacture : 20th August 1980

Total Hours Since New : 23392:14 Hours

Total Cycles Since New : 36092 Cycles

Initial Issue of C of A in Nepal : 13th May 1998

Validity of C of A : 15th July 2006

Last C of A Test Flight Carried out on : 28th July 2005

Last SP2- 500 Hours Inspection : 17th June 2006

Last SP2 – 250 Hours Inspection : 17th June 2006

Last 125 Hours Inspection : 17th June 2006

Last SP2 – 100 Hours Inspection : 28th May 2006

Last Weekly Inspection : 19th June 2006

Last Daily Inspection : 20th June 2006 18:30 Hours LT

Last PIREP Defect and its Rectification: 16th May 2006
 # After landing left swing tendency observed – Nose Wheel Steering Cable retightened and rigged for centerline.
 Operation Check carried out. Steering System Normal.
 # Centerline of Nose wheel steering deviates left even Nose Wheel Centers – Nose Wheel Steering Centerline adjusted & Operation checked found normal.

Left Hand Engine

Make : Pratt & Whitney

Model : PT6A-27

Engine Serial Number : PCE 50242

Installation Date : 15th April 2006

At Installation, Engine TSO : 2784:48 Hours

At Installation Engine CSO : 5921 Cycles

Engine Overhauled by : Dallas Airmotive on 17th May 2002

Engine Time Since Overhaul : 3095:59 Hours

Engine Cycles Since Overhaul : 6540 Cycles
 Engine Time Since New : 22017:33 Hours
 Engine Cycles Since New : 33640 Cycles
 Engine Change Test Flight : 16th April 2006
 Last Hot Section Inspection : 13th December 2005 at Engine TSO:2424:17
 Hours
 Last PIREP Defect & Rectification : 16th April 2006
 # LH Engine over speed governor U/S – LH
 Engine OSG Solenoid ground connection
 found intermittent, same connection cleaned
 and retightened. OS function found normal.

Right Hand Engine

Make : Pratt & Whitney
 Model : PT6A-27
 Engine Serial Number : PCE PG0125
 Installation Date : 25th March 2004
 At Installation, Engine TSO : 0:00 Hours
 At Installation Engine CSO : 0 Cycles
 Engine Overhauled by : Pratt & Whitney, Canada on 30th December 2003
 Engine Time Since Overhaul : 3287:42 Hours
 Engine Cycles Since Overhaul : 6650 Cycles
 Engine Time Since New : 6971:36 Hours
 Engine Cycles Since New : 14473 Cycles
 Last Hot Section Inspection : 07th December 2005 at Engine TSO: 2408:07
 Hours
 Last PIREP Defect & Rectification : 07th June 2006
 # right Engine T5 observed 725⁰C during Take
 Off Roll at Jumla with 37 PSI Take Off Power-
 Right Engine T5 Indication Connection cleaned
 and re-connected. T5 Calibration carried out
 Ground Run Observed, found normal.

Left Hand Propeller

Make : Hartzell
 Model : HC-B3TN-3D
 Serial Number : BUA-23179
 Installation Date : 13th September 2005
 At Installation, Propeller TSO : 0:00 Hours
 At Installation, Propeller CSO : 0 Cycles
 Propeller Overhauled by : Safe Air Limited on 30th May 2005
 Propeller Time Since Overhaul : 1332:45 Hours
 Propeller Cycles Since Overhaul : 2669 Cycles
 Propeller Blades Position/Serial Numbers: # 1 K22302
 2 K22303
 3 K22304

