

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

					Reference:	CA18/2/3/8838	
Aircraft Registration	ZS-REU	Date of Accident	22 September 2010		Time of Accident	0800Z	
Type of Aircraft	Schweizer 269C-1		Type of Operation		Private		
Pilot-in-command Licence Type		Private (helicopter)	Age	23	Licence Valid	Yes	
Pilot-in-command Flying Experience		Total Flying Hours	115.5		Hours on Type	2.1	
Last Point of Departure		Kob Inn Beach Resort, Eastern Cape					
Next Point of Intended Landing		Port Alfred, Eastern Cape					
Location of the Accident Site with Reference to Easily Defined Geographical Points (GPS readings if possible)							
Kob Inn Beach Resort, Eastern Cape (GPS co-ordinates: S32° 26.446' E028° 40.378')							
Meteorological Information		SA Weather Services Report: Scattered low cloud, strong surface winds and moderate to severe turbulence in the Kob Inn area					
Number of People on Board	1 + 1	No. of People Injured	0	No. of People Killed	0		
Synopsis		<p>After flying for approximately 2.65 hours, the pilot, accompanied by a passenger on a private flight from Margate to Port Alfred, stopped en route at Kob Inn Beach Resort at 0710Z. The pilot and passenger then enjoyed a leisurely breakfast at the Kob Inn restaurant, where after they boarded the helicopter for the next leg from Kob Inn to Port Alfred.</p> <p>The pilot stated that the engine started normally and he subsequently lifted the helicopter into a hover in prevailing crosswind conditions. The engine indicated a manifold pressure (MP) of 25" at the time, which was considered sufficient for a vertical take-off. The pilot then turned the nose of the helicopter into the wind for a steep take-off, but as he was going through transition, the low rotor revolutions per minute (RPM) warning horn sounded. He then rolled on the throttle and lowered the collective in order to restore the RPM, but the RPM continued to drop and the helicopter started to experience a loss of height. He then manoeuvred the helicopter away from the pool area, whereafter the helicopter collided with a 'jungle gym' wooden construction, causing the helicopter to roll over onto its right-hand side. The main rotor blades, tail boom, tail rotor and skids subsequently sustained substantial damage during the impact sequence.</p> <p>The pilot and passenger escaped unharmed during the accident sequence.</p>					
Probable Cause		<p>The helicopter impacted an obstacle (jungle gym) on the ground following decay in main rotor RPM during a vertical take-off attempt.</p> <p>Contributory factor:</p> <p>The pilot failed to use sufficient collective pitch to prevent loss of altitude during the transition.</p>					
IARC Date				Release Date			



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : North Coast Chartering Services
Manufacturer : Schweizer Aircraft Corporation
Model : 269C-1
Nationality : South African
Registration Marks : ZS-REU
Place : Kob Inn Beach Resort Eastern Cape
Date : 22 September 2010
Time : 0800Z

All times given in this report are co-ordinated universal time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus two hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability.***

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 The pilot stated that he was accompanied by a passenger on a private flight from Margate to Port Alfred, when they landed en route at Kob Inn Beach Resort at 0710Z after flying for approximately 2.65 hours.
- 1.1.2 The pilot and passenger then enjoyed a leisurely breakfast at the Kob Inn restaurant, whereafter they climbed back onboard the helicopter for the next leg of the flight to Port Alfred.
- 1.1.3 The pilot further stated that the engine started normally and that he subsequently lifted the helicopter into a hover in prevailing crosswind conditions. The engine indicated a manifold pressure (MP) of 25" at the time, which was considered sufficient for a vertical take-off. The pilot then turned the nose of the helicopter into the wind for a steep take-off, but as he was going through transition, the low rotor RPM warning horn sounded. He then rolled on the throttle and lowered the collective in order to restore the RPM, but the RPM continued to drop while the helicopter started to experience a loss of height. He then manoeuvred the helicopter away from the pool area, whereafter the helicopter collided with a 'jungle gym' wooden construction, causing the helicopter to roll over onto its right-hand side. The main rotor blades, tail boom, tail rotor and skids subsequently sustained substantial damage during the impact sequence.
- 1.1.4 The pilot and passenger escaped unharmed during the accident sequence.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1	-	1	-

1.3 Damage to Aircraft

1.3.1 The helicopter sustained substantial damage to the main rotor blades, tail boom, tail rotor and skids.



Figure 1: The helicopter next to the jungle gym wooden construction

1.4 Other Damage

1.4.1 Slight damage to the jungle gym structure at Kob Inn.

1.5 Personnel Information

1.5.1 Pilot-in-command:

Nationality	South African	Gender	Male	Age	23
Licence Number	*****	Licence Type	Private (helicopter)		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	22 December 2018				
Restrictions	None				
Previous Accidents	Nil				

1.5.2 Pilot-in-command Flying Experience:

Total Hours	115.5
Total Past 90 Days	10.0
Total on Type Past 90 Days	7.3
Total on Type (Since Conversion)	2.1

1.5.3 The pilot was converted onto the Schweizer 269 C-1 helicopter on 13 September 2010.

1.6 Aircraft Information

1.6.1 Airframe:

Type	Schweizer 269C-1	
Serial Number	0369	
Manufacturer	Schweizer Aircraft Corporation	
Date of Manufacture	2010	
Total Airframe Hours (At Time of Accident)	141.0	
Last MPI (Date & Hours)	16 September 2010	94.1
Hours Since Last MPI	46.9	
C of A (Issue Date)	9 June 2010	
C of R (Issue Date) (Present Owner)	7 May 2010	
Operating Categories	Standard	

1.6.2 Engine:

Type	Lycoming HI O-360-GIA
Serial Number	L-34607-51A
Hours Since New	141.0
Hours Since Overhaul	TBO not yet reached

1.7 Meteorological Information

1.7.1 The following meteorological information was obtained from the pilot's questionnaire:

Wind Direction	SW	Wind Speed	20 kt gusting 27 kt	Visibility	CAVOK
Temperature	22°C	Cloud Cover	CAVOK	Cloud Base	None
Dew Point	-				

1.7.2 The South African Weather Services (SAWS) submitted the following weather observations at the time of the accident:

1.7.2.1 WEATHER CONDITIONS IN THE VICINITY OF THE INCIDENT

The analysis of the METAR together with the satellite image indicates the presence of scattered low clouds, strong surface winds and moderate to severe turbulence in the Kobb Inn area at about the time of the incident.

1.7.2.2 SATELLITE IMAGE (0800Z 22 SEPTEMBER 2010)

The satellite image (Figure 2) shows scattered to broken low-level clouds over the southern parts of the country due to the onshore flow caused by the frontal system. The presence of the cloud streets (with a north-south orientation) over the south-eastern parts of the country indicates the occurrence of low-level turbulence over these areas.

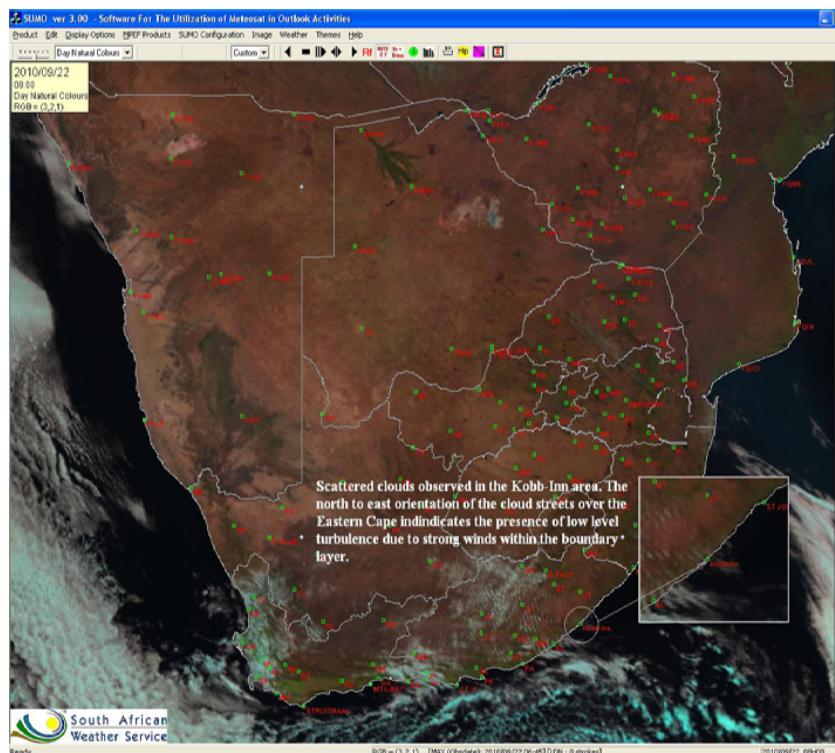


Figure 2: Satellite image at the accident site at Kobb Inn in the Eastern Cape

1.8 Aids to Navigation

1.8.1 The aircraft was fitted with standard navigational instrument equipment. No defects were reported prior to or during the flight, or at the time of the accident.

1.9 Communications

1.9.1 There was no communication with Air Traffic Control (ATC) services as the helicopter was operated outside the boundaries of controlled airspace.

1.10 Aerodrome Information

1.10.1 The helicopter landed and attempted to take off from Kob Inn Beach Resort in the Eastern Cape (GPS Co-ordinates: S32° 26.446' E028° 40.378'), at an elevation of 5ft above mean sea level (AMSL). A windsock is located at the beach resort.



Figure 2: The wreckage with windsock on swing frame.

1.11 Flight Recorders

1.11.1 The aircraft was not equipped with a cockpit voice recorder (CVR) or a flight data recorder (FDR), nor was either required by regulations.

1.12 Wreckage and Impact Information

1.12.1 The helicopter collided with a jungle gym wooden construction, causing the helicopter to roll over onto its right-hand side. The main rotor blades, tail boom, tail rotor and skids subsequently sustained substantial damage during the impact sequence.

1.12.2 The jungle gym was slightly damaged.

1.13 Medical and Pathological Information

1.13.1 The pilot and passenger sustained no injuries during the impact sequence.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The occupants sustained no injuries as they were properly secured with lap belts and shoulder harnesses.

1.16 Tests and Research

1.16.1 Aircraft Airworthiness Status:

According to available information, the aircraft was correctly maintained and airworthy at the time of the accident.

1.16.2 Weather Information:

Analysis of the METAR together with the satellite image indicates the presence of scattered low clouds, strong surface winds and moderate to severe turbulence in the Kob Inn area at the time of the accident.

1.17 Organisational and Management Information

1.17.1 This was a private flight.

1.17.2 The helicopter was registered as a new helicopter on 7 May 2010.

1.17.3 The aircraft was maintained by an approved Aircraft Maintenance Organisation (AMO). The last mandatory periodic inspection (MPI) was carried out on 16 September 2010 at a total of 94.1 airframe hours.

1.18 Additional Information

Source: *Good Aviation Practice* by North Shore and Canterbury Helicopters

1.18.1 Tailwind:

Lifting off with a tailwind means a higher groundspeed and a higher angle of climb, which is bad for obstacle clearance. Tailwind take-offs should be avoided unless absolute necessary, and only attempted by experienced pilots.

1.18.2 Crosswind:

A crosswind situation will affect take-off and landing performance because of the reduction of the headwind component and the difficulties in maintaining directional control. As a general rule, if the wind is 30° off the landing/take-off heading, the headwind is effectively reduced by 15%. If the wind is 45° off, the headwind is reduced by 30 percent. A light crosswind might be an advantage or disadvantage with respect to take-off or landing performance, depending whether the wind is from the starboard or port side. This increase in the total rotational force must be overcome by additional tail rotor thrust, thus absorbing more power from the engine. If the engine is unable to produce the additional power, the pilot must reduce collective pitch, which will cause the helicopter to descend. If the pilot fails to reduce collective pitch, the rotor RPM will decay and the helicopter will descend in an uncontrolled manner.

1.18.3 Turbulence and Windshear:

The possibility of turbulence and windshear should be considered when determining landing and take-off performance. Windshear is a change of wind speed and/or direction over a very short time/distance, and can cause the loss of translational lift and increase the power required to that of out-of-ground effect (OGE) hover and beyond – particularly if accompanied by a downdraft. Local terrain, trees and buildings all influence the flow of wind near them. The mechanical disturbance resulting from this disturbed airflow may become very marked in the lee of the obstruction. In winds below 15 kt, the disturbance in the lee may extend vertically to about one third higher again than the obstruction. In winds above 20 kt, eddies can occur on the leeward side to a distance of about 10 to 15 times the obstruction height and up to twice the obstruction height above the ground. A gust wind situation where shear-wind is likely to be present during take-off will require a greater power margin to deal with, and can cause unexpected loss of airspeed and height.

1.18.4 Recovery from a Low Rotor RPM Situation (Federal Aviation Administration):

In certain conditions, a situation might occur where the RPM is low even though maximum throttle is used. This is usually the result of the main rotor blades having an angle of attack that has created so much drag that engine power is not sufficient to maintain or attain normal operating RPM.

If a low RPM situation is experienced, the lifting power of the main rotor blades can be greatly diminished. As soon as a low RPM condition is detected, immediately apply additional throttle, if available, while slightly lowering the collective. This reduces main rotor pitch and drag. As the helicopter begins to settle, smoothly raise the collective to stop the descent. At hovering altitude, you may have to repeat this technique several times to regain normal operating RPM. This is sometime called 'milking the collective'. The amount the collective can be lowered depends on altitude.

1.18.5 Normal take-off from a Hover (Federal Aviation Administration):

Normal take-off from a hover is an orderly transition to forward flight and is executed to increase altitude safely and expeditiously. During the take-off, fly a profile that avoids the cross-hatched or shaded areas of the height-velocity diagram (Figure 3).

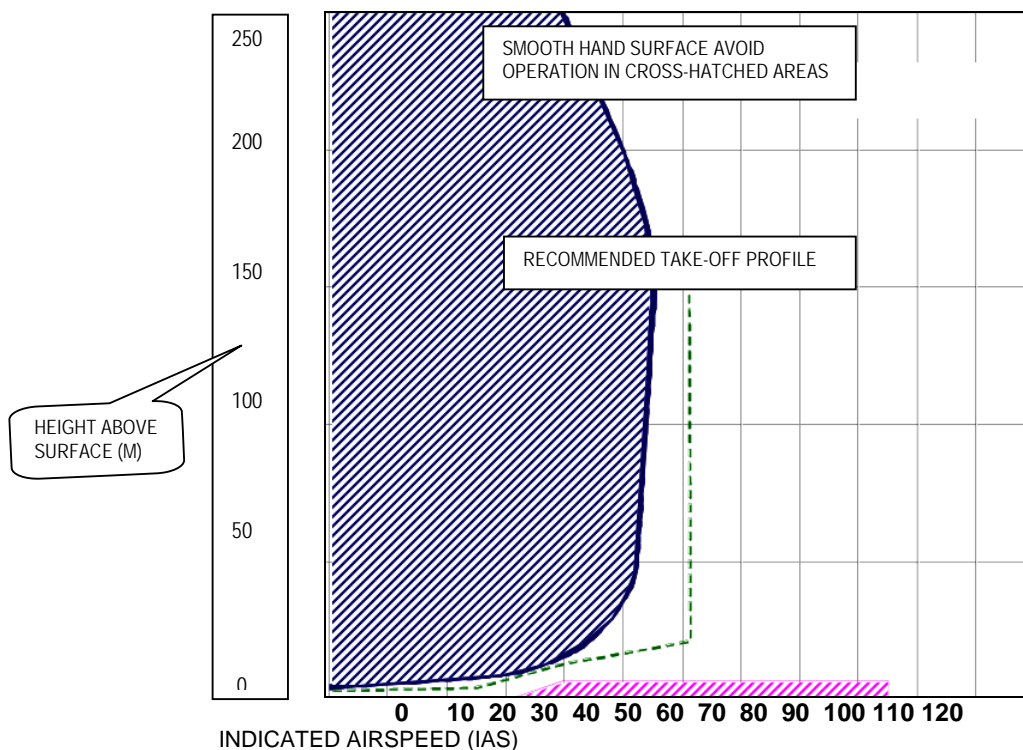


Figure 3: Height-velocity diagram

1.19 Useful or Effective Investigation Techniques

1.19.1 None considered necessary.

2. ANALYSIS

- 2.1 On 22 September 2010, the pilot, accompanied by a passenger, flew the helicopter from Margate on a private flight and landed at Kob Inn Beach Resort after flying for 2 hours and 25 minutes.
- 2.2 After the pilot and passenger enjoyed a leisurely breakfast, they boarded the helicopter to take off from Kob Inn to Port Alfred. The engine started normally and the pilot subsequently lifted the helicopter into a hover in prevailing crosswind conditions. The engine indicated a manifold pressure (MP) of 25" at the time, which the pilot considered sufficient for a vertical take-off. The pilot turned the nose of the helicopter into the wind for a steep take-off when the low rotor RPM warning horn sounded as he was going through transition. Although the pilot rolled on the throttle and lowered the collective in order to restore the RPM, the RPM continued to drop and the helicopter started to lose height, and crashed on top of a jungle gym wooden construction.
- 2.3 The main rotor blades, tail boom, tail rotor and skids subsequently sustained substantial damage during the impact sequence.

- 2.4 The occupants were properly restrained with seat belts and shoulder harnesses and escaped without any injuries.
- 2.5 The above sequence of events occurred at a too a low height above the ground for the pilot to recover effectively.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot had a valid private pilot licence (helicopter) and was properly rated at the time of accident.
- 3.1.2 According to available information, the aircraft was properly maintained.
- 3.1.3 The helicopter was registered as a new helicopter on 07 May 2010 and issued with a standard Certificate of Airworthiness.
- 3.1.4 According to available information, strong surface winds and moderate to severe turbulence conditions prevailed at Cob Inn at the time.
- 3.1.5 The pilot experienced a low RPM warning when he turned into the headwind to attempt a steep vertical take-off, and did not have enough height to recover in time.
- 3.1.6 The helicopter impacted a jungle gym wooden obstacle on the ground, causing substantial damage to the aircraft.

3.2 Probable Cause/s

- 3.2.1 The helicopter impacted an obstacle (jungle gym) on the ground following decay in main rotor RPM during a vertical take-off attempt.

3.3 Contributory Factor/s

- 3.3.1 The pilot failed to use sufficient collective pitch to prevent loss of altitude during the transition.

4. SAFETY RECOMMENDATIONS

- 4.1 None

5. APPENDICES

- 5.1 None

Report reviewed and amended by the Advisory Safety Panel 16 November 2010.

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