Australian Government
Australian Transport Safety Bureau

Collision with terrain involving a Bell 206, VH-NKW

near Taroom, Queensland, 20 June 2014

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Aviation Occurrence Investigation
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Addendum

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What happened

On 20 June 2014, at about 1500 Eastern Standard Time (EST), the pilot of a Bell 206 helicopter, registered VH-NKW, was tasked to drop equipment bags for seismic operations about 6 NM east of Taroom, Queensland. The task was to be accomplished by using a magnetic bag runner connected to the helicopter by a 100 ft long-line.

Magnetic bag runner

Source: Operator

The helicopter lifted off with seven bags loaded on the runner. During the flight of about 2 NM, at about 1,500 ft above ground level (AGL), the pilot observed that the bag lanyards, which were about 1.5 m in length, became tangled. The pilot flew the helicopter about 500 m beyond the drop site and turned into wind, commencing the approach from about 500 ft AGL. The pilot manoeuvred the bags onto the ground and using dual switches on the cyclic control, released the two solenoids to drop the first bag. The lanyard was tangled around the others and when the pilot raised the helicopter higher, the released bag remained hanging and entangled with the other bags. The pilot then released the solenoids for the second bag and raised and lowered the helicopter in an attempt to make the bags drop. He then repeated this for six bags and eventually one bag remained connected to the runner with the other bags entangled and hanging from it. The pilot attempted to release the last remaining solenoid, however it had jammed.

Due to the risks associated with flying with an unsecured load and the bags potentially becoming free and falling, the pilot elected to land the helicopter to untangle the bags. The bags' initial drop had been at the top of a mound, and the slope was not suitable for landing. The pilot manoeuvred the helicopter backwards down the slope to land on a more suitable site, while ensuring the long-line was being laid out on the ground. When about 10 ft above the ground, he turned the helicopter about 90° to the right, with the long-line and load out to the left of the helicopter. He descended further, and started backing up slightly to manoeuvre the helicopter in such a way that the line came out the front of the helicopter between the landing skids.

Due to vegetation behind the helicopter, the pilot manoeuvred slightly further to the right, however when crabbing right to the selected landing area, the long-line became fully extended and went taut. As the line pulled taut it had moved to come directly out the left side of the helicopter from under the centre of the left skid. This created a hinge moment which caused the helicopter to roll to the right (Figure 1).

Figure 1: Bags and accident site

Source: Operator

The pilot immediately attempted to press the hook release switch for the long-line and applied right cyclic to fly the helicopter in the direction of the roll. However the main rotor blades contacted the ground before the pilot reached the switch. The helicopter rolled over and came to rest inverted. The pilot switched off the fuel and battery and activated the emergency beacon. He exited the helicopter and then detected a small grass fire burning under the engine exhaust and retrieved the fire extinguisher to put out the fire. The helicopter sustained substantial damage (Figure 2).

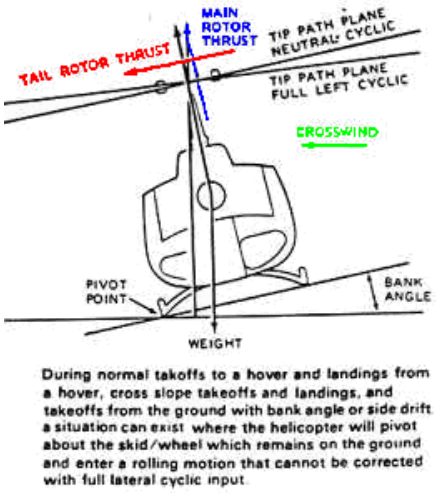
Figure 2: Damage to VH-NKW

Source: Operator

Dynamic rollover

Dynamic rollover is usually the result of the helicopter pivoting about a skid which remains in contact with the ground. In this incident, the long-line pulled taut under the skid and became the support under the pivot point resulting in a dynamic roll over (Figure 3).

Figure 3: Dynamic rollover



Source: Operator

Pilot comments

The pilot reported that, in hindsight, he would have lifted the bags up and moved them to a flat piece of grass to land and untangle them. Industry best practice is to use a carousel bag picker to drop the bags one at a time rather than the runner, as the lanyards are separated and the bags are unlikely to tangle. The runner is better suited for operations where the bags are picked up and then returned to a central location, where, if they become entangled, a member of the ground crew can assist in releasing them.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Helicopter operator

Review of standard operating procedures

The operator has completed a review of the standard operating procedures for under-slung operations. A daily inspection and check of all sling equipment is to occur prior to commencing each day's sling activities and be signed off. For any under-slung load, all terrain runner (ATR) or sling and carousel problems, the pilot must follow these procedures:

- All under-slung load related issues and problems are to be rectified at the staging area only. If the issue occurs in the field, the aircraft is to return to the staging area or an alternate safe location to have the problem fixed by ground crews.
- Aircraft may land in the field to fix sling equipment, ATR bag runner or carousel, by the pilot if the aircraft is shut down prior to the pilot exiting the aircraft.
- The pilot in command must remain at the controls of the aircraft at all times while rotors are turning and/or the engine/s are running.

Use of the ATR bag runner

The ATR bag runner is not to be used for bag layout operations. It is only to be used for bag retrieval/pick-up.

Safety message

This incident demonstrates the importance of using equipment in accordance with the principles of best practice. It also provides a reminder to pilots to consider all factors in selecting a landing site and the additional requirements of an external load.

General details

Occurrence details

Date and time:	20 June 2014 – 1530 EST	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	11 km E Taroom aerodrome, Queensland	
	Latitude: 25° 49.13' S	Longitude: 150° 00.52' E

Helicopter details

Manufacturer and model:	Bell Helicopter Company 206L-3	
Registration:	VH-NKW	
Serial number:	51463	
Type of operation:	Aerial work	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Minor	Passengers – Nil
Damage:	Substantial	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.