



**NEW ZEALAND HELICOPTER SECTOR  
SAFETY UPDATE  
MARCH 2019**

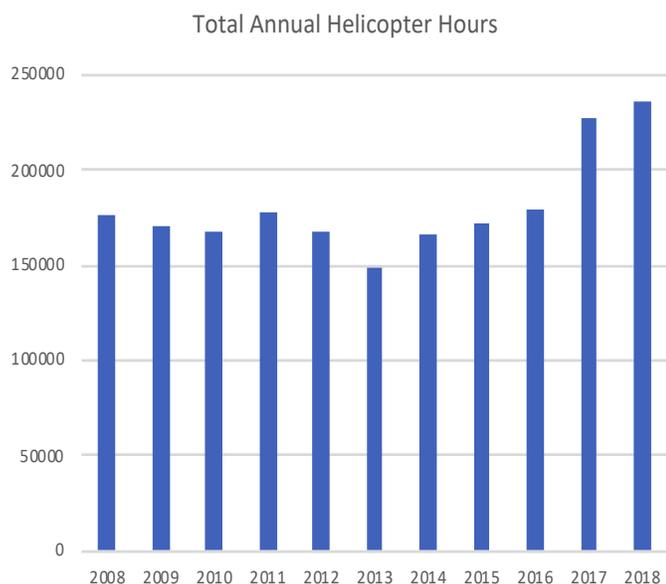
# INTRODUCTION

This is a further update on activity and safety performance in the helicopter and agricultural aviation sectors, with activity and accident rate information current to December 2018. The report includes details of accidents and incidents for the purpose of raising awareness about risks and sharing lessons amongst the sector.

If you have questions or comments about the information then please contact me at [Joe.Dewar@caa.govt.nz](mailto:Joe.Dewar@caa.govt.nz).

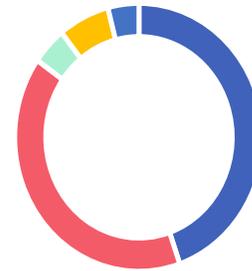
# SECTOR ACTIVITY

Based on activity returns received for 2018 we estimate a record year for helicopter activity with an estimated total 235,000 hours, about 10,000 more than 2017.



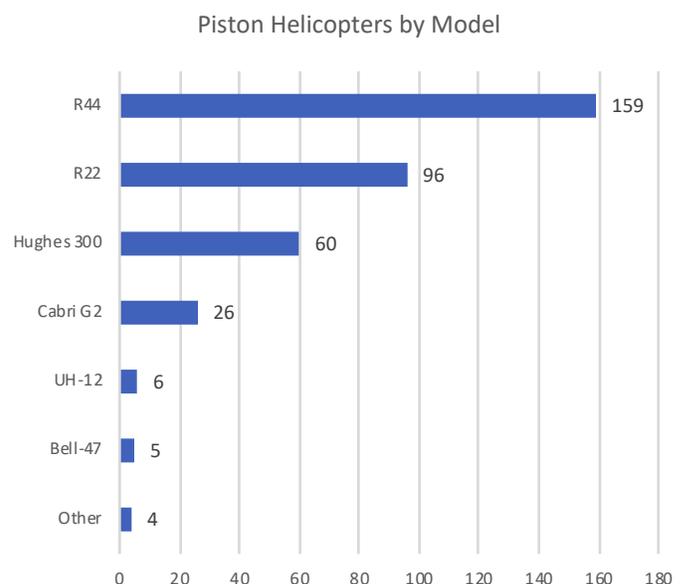
The majority of flying was performed on air transport and agricultural operations.

Proportion of 2018 Hours by Operation Type

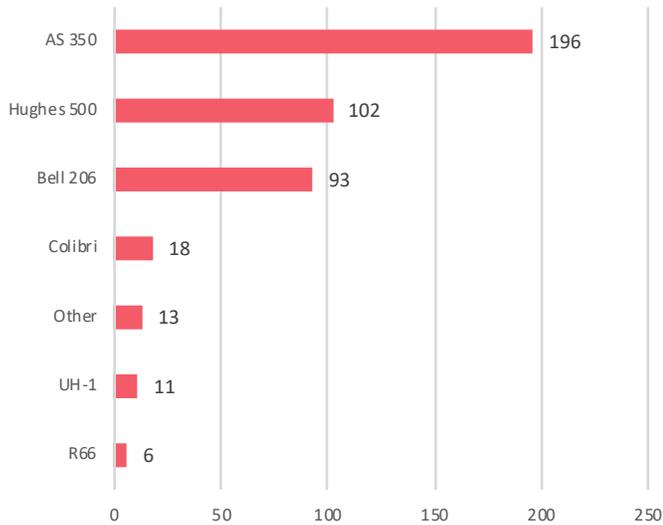


■ Transport ■ Agricultural ■ Training ■ Other Commercial ■ Private

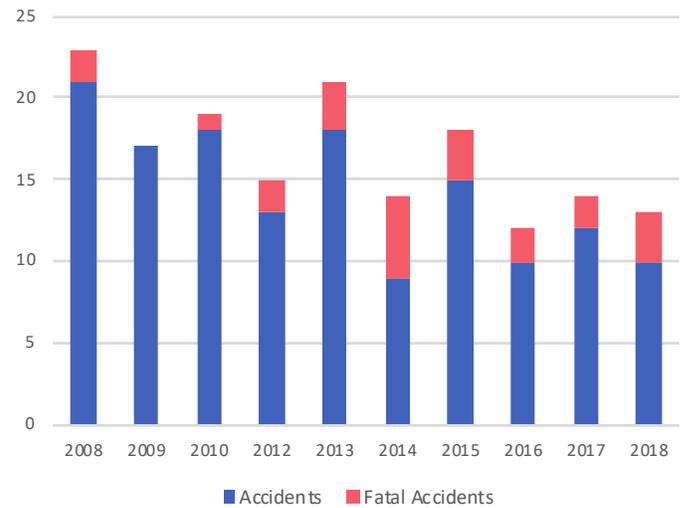
The number of helicopters on the register has increased to 897. The charts below break down the total by engine and model type.



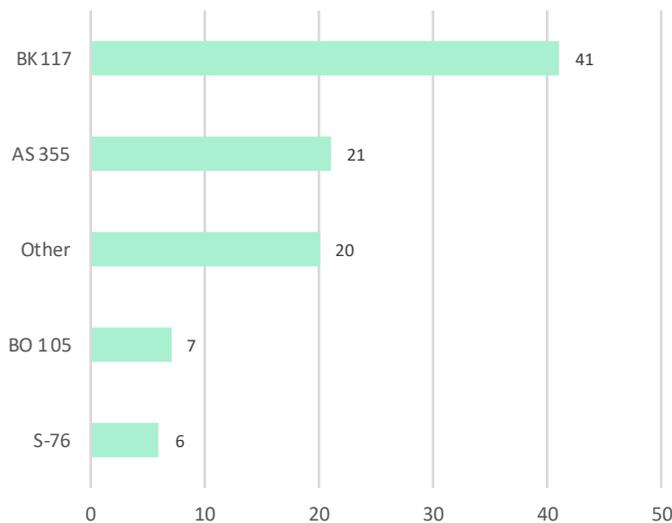
Single Turbine Helicopters by Model



Accidents and Fatal Accidents per Year

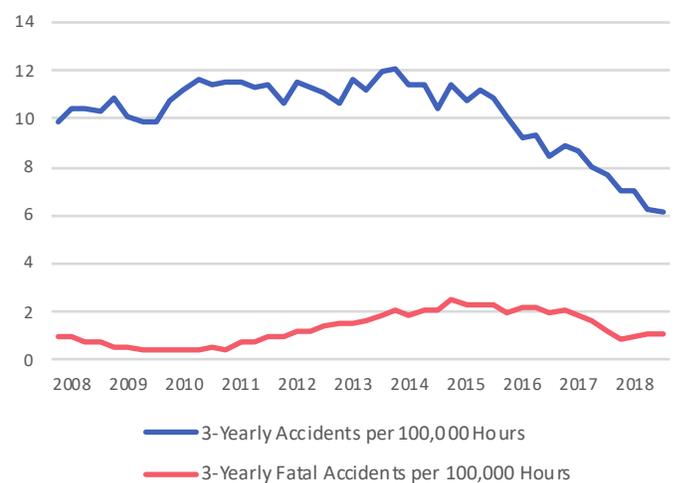


Twin Turbine Helicopters by Model



Note that all rates are current to December 2018. The current overall 3-yearly moving average accident rate per 100,000 flight hours is 6.16. The fatal accident rate is 1.11 per 100,000 hours.

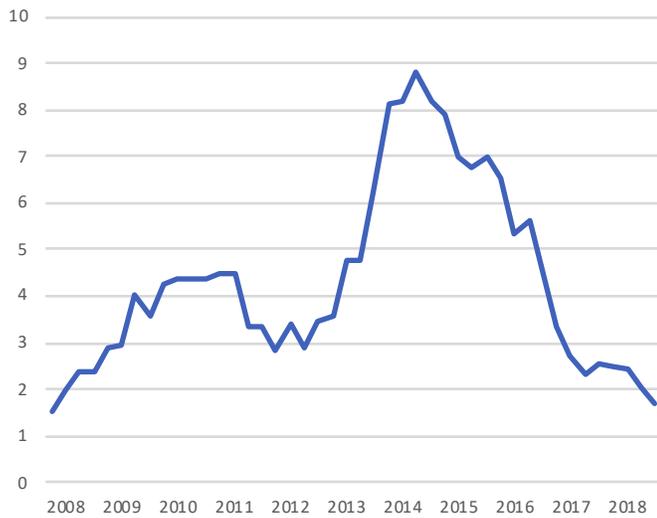
3-Yearly Accidents & Fatal Accidents per 100,000 Hours



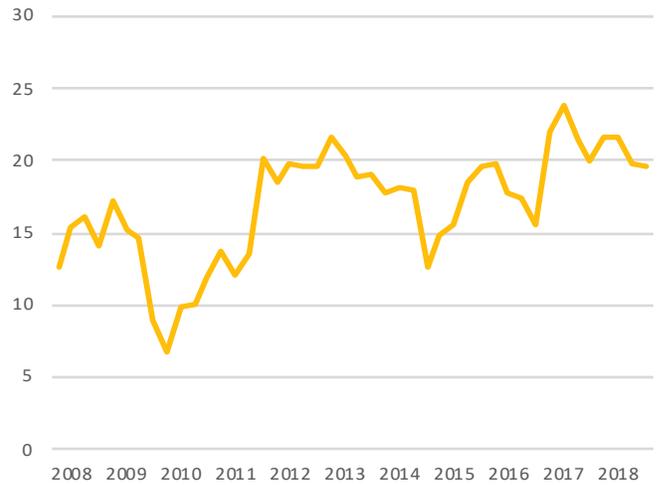
## HELICOPTER ACCIDENT RATES

There were thirteen helicopter accidents in 2018, three of which were fatal. In 2019 to date there have been three helicopter accidents reported.

Air Transport 3-Yearly Accidents per 100,000 Hours

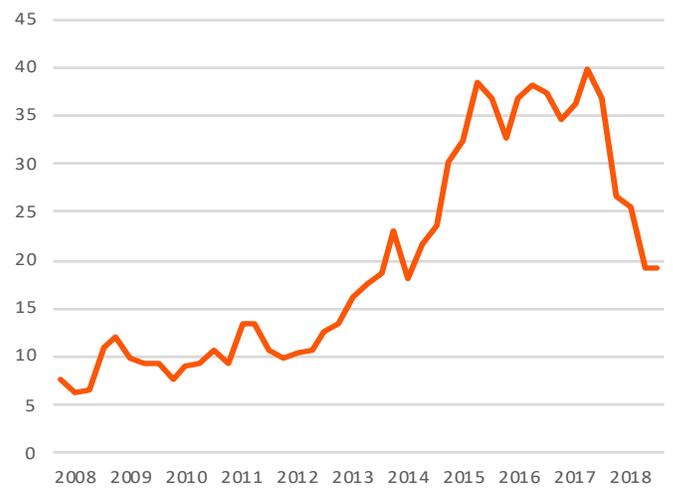


Other Commercial 3-Yearly Accidents per 100,000 Hours

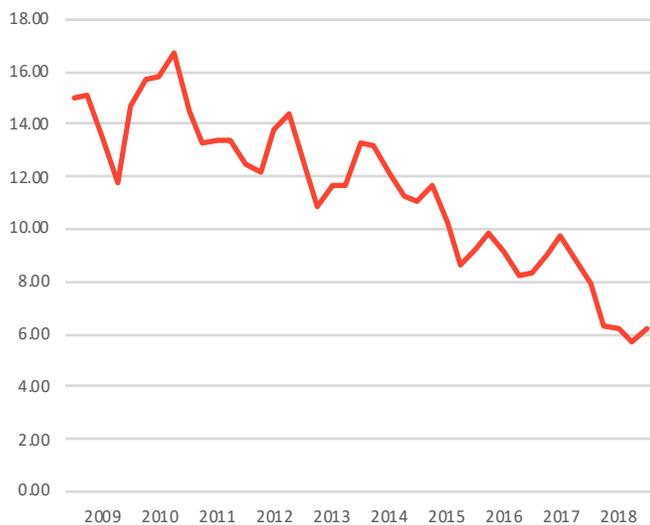


The sector with the lowest rate currently is air transport operations. The 3-yearly moving average rate in this sector is 1.67 per 100,000 hours. The next lowest is the agricultural sector with 6.25 accidents per 100,000 hours. The rate in the training sector has reduced down to below 20 for the first time since 2014, and the rate for other commercial operations sits at 19.70 per 100,000 hours.

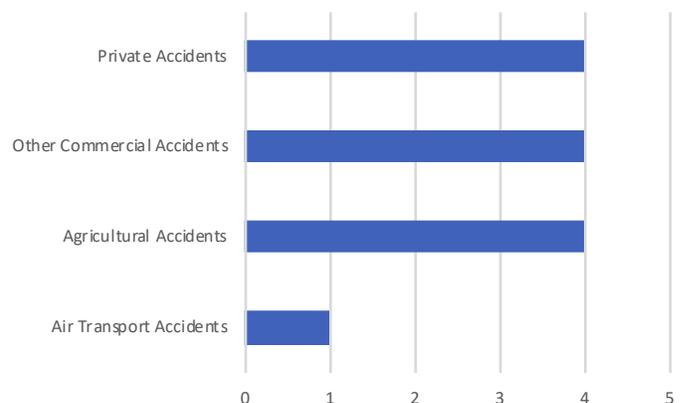
Training 3-Yearly Accidents per 100,000 Hours



Agricultural 3-Yearly Accidents per 100,000 Hours



2018 Accidents by Operation Type



## ACCIDENT DETAILS

Details of the 13 accidents in 2018 are provided below. Note that a number are currently under investigation by the Transport Accident Investigation Commission.



January



Canterbury



Hughes 300



Loss of control - performance management

The helicopter's RPM decayed on final approach, approximately 150m from the landing point, at 100 ft. altitude. The pilot was unable to recover the situation, and auto rotated onto a slope from which the helicopter slid 5-6m down the slope, breaking the tail boom and one skid.

No defects were found. The pilot had very limited experience on the helicopter type and did not recognise the onset of low RRPM which required proactive control inputs including rolling on throttle.

Due to the height above ground and the descent rate, impact with the ground could not be avoided.

Pilots are reminded to actively monitor the RRPM and to manage the required control inputs.



January



Canterbury



R44



Collision/strike - tree

The pilot was engaged on an external load operation, sling loads of fencing equipment. While entering a hover and focusing on positioning the load, the main rotor blade made contact with a tree on the pilot's blindside. The pilot released the load and turned towards the track to land. The helicopter made contact with the edge of a bank, spun to the right, and descended backwards into the bush. The pilot was not injured.

The operator's investigation identified situational awareness as the main contributor to the accident. The key lessons identified were the importance of making sure that ground crew understand their responsibilities around providing guidance to pilots where terrain/obstacle clearance has been identified as a hazard.

In addition the operator noted the importance of ensuring that longlines are of sufficient length to give maximum practical clearance of obstacles.



January



Wellington



BK 117



Collision/strike - tree

At the conclusion of an external load operation it was determined after an inspection of the main rotor blades that they had made contact with trees. The internal investigation identified that the use of a previous risk assessment, without evaluating the site for hazards, prevented the identification of the hazards presented by the tree line. The use of the 50' long line reduced the safety margin and would not have been used if a 100' long line had been available on the site.



February



Wanaka



Cabri G2



Abnormal landing

The operator reported that the helicopter landed heavily and rolled over following a practice autorotation.



May



Nelson



AS 350



Collision/strike - tree

On an operation spraying a forestry block, during a turn coming back to start another spray line the helicopter struck a tree with the main rotor blade. The strike damaged one of the blades significantly and put the aircraft out of balance. The pilot landed the helicopter on an old forestry skid site a 100m away. Cloud cover and poor light were identified as key causal factors for the pilot not identifying the tree.



June



Near Waiouru



Hughes 600



Under investigation

The helicopter crashed while on a survey operation, with one of the occupants dying in hospital after the accident. TAIC are investigating the accident.



The crash scene



June



Southland



Hughes 300



Engine power loss

During the takeoff and departure, the helicopter suffered a loss of power, with the pilot attempting to return and land on a ridge. Due to insufficient power the helicopter impacted a bank and rolled. The pilot was not injured.



July



Otago



Robinson R44



Under investigation

The R44 helicopter went missing over Lake Wanaka. Search helicopters identified an oil slick and some debris around Stevenson’s Island. Over the next two days, searches by Police equipped with a sonar and a Royal New Zealand Navy remotely operated underwater vehicle located the helicopter on the lake bed close to where the oil slick had been first observed. The pilot and helicopter wreckage were recovered during the night of 23-24 July. The interim TAIC report found that “signature marks on the underside of the main rotor blade that matched the spacing of the screws on the canopy bow, and the damage sustained by the altimeter and the ‘captured’ altimeter reading, indicated that the main rotor blade had struck and entered the cabin in flight.” The full interim report is available here: <https://taic.org.nz/inquiry/ao-2018-006>

-  September
-  Bay of Plenty
-  Robinson R22
-  Loss of control - dynamic rollover

During a private deer hunting operation the pilot flew over a ridge and encountered a tailwind. This led to low rotor RPM, which the pilot could not recover and they subsequently attempted to land in a field. On landing the skids dug in to soil and the helicopter rolled over.

-  October
-  Wanaka
-  Hughes 500
-  Under investigation

The helicopter crashed shortly after take off from Wanaka Airport. All three occupants were killed in the accident. A TAIC investigation into the accident is underway. The full interim report is available here: <https://taic.org.nz/inquiry/AO-2018-009>

-  October
-  Bay of Plenty
-  AS 315 Lama
-  Engine power loss

During a forest spraying operation, taking the weight while lifting with another load, at approximately 40 feet there was a loud bang from the engine, immediately followed by a loss of power. The pilot used the remaining rotor energy to reduce the rate of descent but landed heavily in the upright position. There were no injuries but the aircraft sustained some damage.



November



Otago



AS 350



Component/system failure or malfunction

The helicopter was engaged in a forest spraying operation and suffered an engine failure at approximately 300 feet AGL. The helicopter landed heavily on a forestry road and sustained substantial damage. The engineering investigation found that the engine suffered an internal failure causing the turbine assembly to move rearward, severing the Py sense line and shutting down the engine.



November



Canterbury



Robinson R44



Loss of control - dynamic rollover

The helicopter was spraying a field, and when the pilot made a reversal turn to fly out the low RRPM warning horn sounded. The pilot dumped the load and decided to make a run-on landing directly ahead. During this the skid dug into the ground and the helicopter rolled over. There were no injuries but the helicopter sustained some damage.

## 2019 ACCIDENT DETAILS



January



Waikato



Bell 206



Collision/strike - wire

During a pasture spraying operation the pilot lost situational awareness in relation to the position of some power lines. The helicopter struck the power lines and fell to the ground. An investigation is underway.



January



Pacific Ocean



Hughes 500



Ground handling

It was reported that a Hughes 500 took off while still strapped on to the deck of a boat by one line. The aircraft became airborne, was unable to climb due to the strap, and then rolled over crashing onto the deck.



February



Nelson



AS 350



Component/system failure or malfunction

The helicopter was engaged in fire-fighting duties when the pilot noted a sensation that ‘something let go’. He immediately jettisoned the monsoon bucket and flew on to land in a clearing. The helicopter suffered major damage during the subsequent landing and the tail section was severed off. TAIC are investigating.

## INCIDENT REPORTS IN 2018 & 2019

In the safety update sent out to operators in December we identified how incidents involving ground handling, and/or passenger and cargo, were frequently reported throughout 2018, a trend that has continued in 2019. What are these incidents? Most fit under two categories of occurrence defined by the International

Helicopter Safety Team. The first category is RAMP occurrences, defined below:

### RAMP OCCURRENCES

Definition

Ramp accidents are those occurring on or near the ground that involve ground handling factors (e.g., preflight preparation of aircraft, servicing, briefing, boarding, deboarding, rotor wash, doors/latches not secured, or rotor contact to persons).

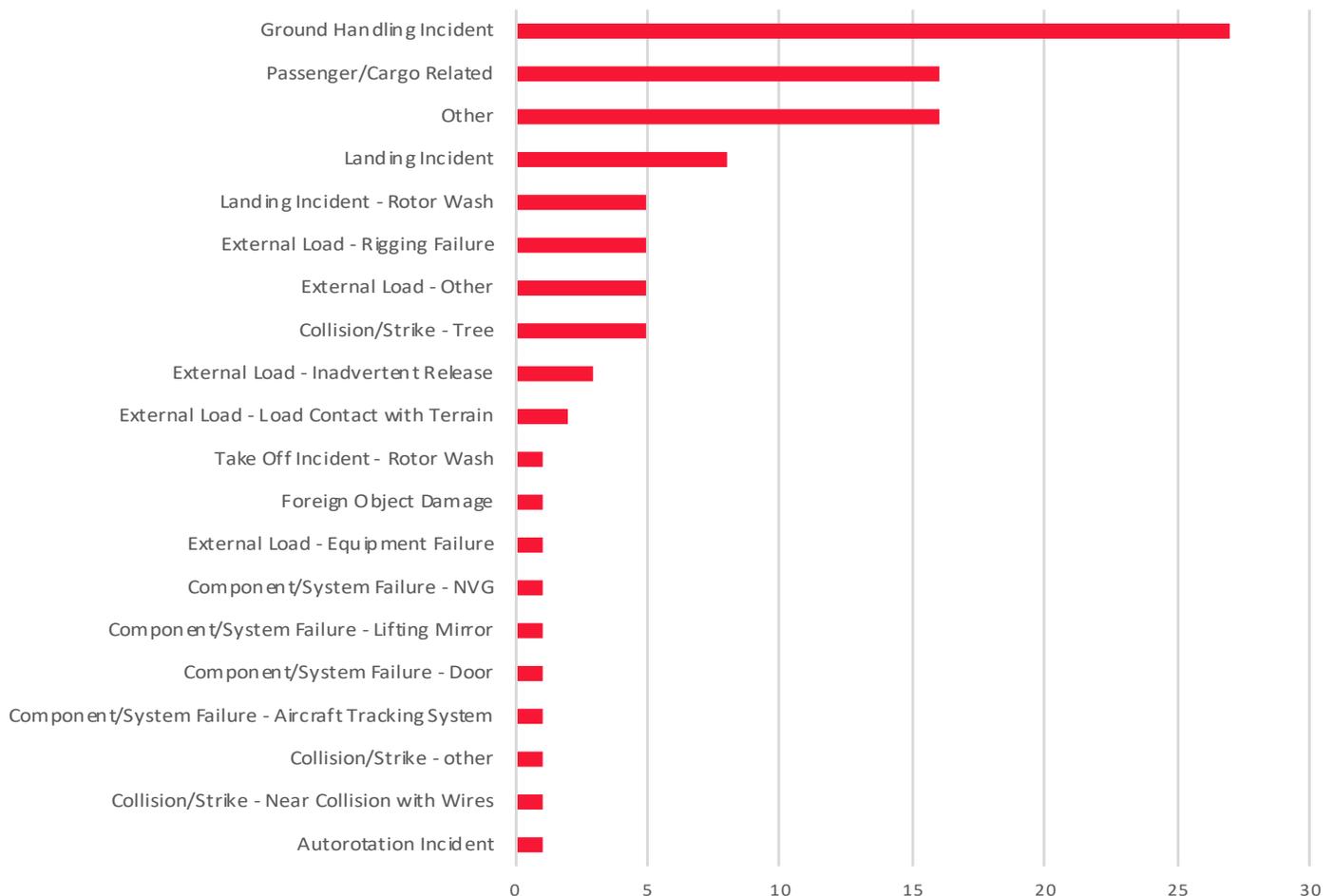
A related category is ‘LANDING ZONE’ occurrences.

### LANDING ZONE (LZ) OCCURRENCES

Definition

This occurrence type deals with hazards associated with using off-airport prepared and unprepared landing areas.

Incidents in 2018 and 2019





November



Marlborough



AS 350



Passenger/cargo related



January



Canterbury



AS 350



Passenger/cargo related

After take off while aircraft was gaining speed, a passenger was observed with her hand on the door and knocked the door handle, opening the top latch on the main left hand door. The pilot continued the descent, and approximately one minute later the Quarter door popped and slammed back against the fuselage. This resulted in a broken window within the quarter door as well as a bent frame and damage to side left hand locker door.

During a CTO operation, a single passenger was briefed and loaded into the aircraft and their associated luggage loaded into the helicopters pod. The pilot loaded the passenger and equipment with the engine and blades stationary. After doing a pre flight walk around nothing out of the ordinary was spotted from what the pilot can recall. The aircraft departed on passing through approximately 300ft AGL the front left passengers door came open. The door was pulled closed and latched correctly and the flight continued without incident. The passenger had embarked the aircraft themselves and perhaps didn't latch the door properly. While the passenger was given a preflight brief as any other passenger, they are also an experienced Heli-ski guide. While experienced on other aircraft they had only a small amount of experience with the R44 type helicopter, this perhaps caused the pilot to assume that the passenger knew what they were doing.



October



Southland



AS 350



Ground handling

The boot of the AS 350 B3 helicopter was left open during a spray load. The pilot had left the boot of the squirrel open while getting some nozzles out of it. They noted in the report the need to close the boot if they ever walk away from it to minimise the chance of it being left open again. The operator has also now contained everything that was loose in the boot into a secured container.



November



West Coast



Bell 206



Take off - rotor wash

On take-off the pilot noted the rotor wash disturbed an unseen empty fadge bag. The bag rolled across the ground, but did not lift or come near the helicopter. It appears that ground crew did not secure equipment prior to the helicopter's arrival.



December



Otago



AS 350



Passenger/cargo related

The helicopter had just completed a flight on a remote station relocating two musterers and one dog onto a plateau of the station. After landing and unloading the farm staff and dog he re-entered the machine.

Whilst the pilot was changing the radio frequencies to contact the base with his next intentions, the farm dog left the farm workers (who were 10 metres in front of the machine) approached the machine and jumped in through the open door onto the pilot's lap.

This resulted in the cyclic being knocked forward an estimated 50% of its travel. The pilot immediately removed the dog and recentered the cyclic.

The event caused the helicopter to shudder harshly. Being concerned about the shudder the pilot immediately shut down the aircraft and contacted the Chief Pilot followed by the Maintenance Controller.

An extensive examination of the machine was completed by the pilot, and several photos of areas of interest to the Maintenance Controller were sent to him.

Once it was determined that there was no damage a ground run was made followed by the aircraft being ferried to a hanger in Queenstown for a secondary

inspection.

This inspection revealed no damage and the aircraft was returned to service.

The Chief Pilot/CEO and QM Manager/Occurrence Investigator discussed the event and an SOP for farm operations is being developed.

All staff have been notified of the event, and the importance of ensuring that animals are restrained near running machines understood.



December



West Coast



AS 350



Ground handling

On descent to the icefall, the left rear quarter door popped open. The pilot slowed the aircraft and continued the descent to the icefall pad, which was the safest and most proximate landing site. The cause was determined to be the failure to properly secure the door lower pin and to visually confirm it was located into the floor. Lesson learned - Loaders of doors must not just do a "feel" check of the latch mechanism on this type of door. It's critical to also ensure a visual check is completed so as to positively site the door latch pin is located in the floor receptacle.



December



Whanganui



R44



Ground handling

On lifting off for another load on a forestry spray operation the pilot failed to notice that the delivery hose had not been removed from the spray tank. Just prior to the helicopter reaching the point of nosing over into forward flight the pilot was notified of the attached delivery hose by radio communications from one of the ground crew. The operator has standard operating procedures to confirm that the hose has been removed from the spray tank prior to lift off. On this occasion the pilot did not check with the ground crew that the hose had been removed. This occurrence was communicated to the company pilots and ground crew as a learning opportunity.



February



West Coast



Hughes 500



Ground handling

The helicopter lifted from the helipad while the helicopter loader was still buckling up rear passengers while standing on the skid. The loader climbed inside as the helicopter took off, then alerted the pilot to make them aware of the situation. The pilot returned to the helipad.



January



West Coast



AS 350



Landing - rotor wash



December



Tauranga



BK 117



Landing incident

A helicopter that was parked to one side of the helipad was unseen by the crew until very short finals. A crewman alerted the pilot to stop the descent and 'move up.' The landing helicopter's descent was arrested and the helicopter manoeuvred clear of the potential conflict and landed uneventfully.

On short final to a mountainous landing site to pick up a climbing party, an unsecure baseball cap was drawn into the rotor disk. An unsecure sleeping mat also became airborne but the pilot manoeuvred the aircraft away from it. The operator's investigation determined the incident was due to the inattentiveness to the situation of the guides involved and undertook to provide the guides with further training.



February



Canterbury



Hughes 500



Passenger/cargo related



August



Canterbury



Hughes 500



Other

During the cruise the passenger door popped ajar. The pilot landed as soon as possible, closed the door and confirmed correct latching. It is thought a passenger may have knocked the internal door handle while retrieving his hand held GPS unit from his pocket. A rigging and serviceability check was carried out and the aircraft engineer found no fault with door rigging.

Damage to the main rotor blades was noted post flight. The damage was caused by ejected shell cases during a venison recovery operation. The blades were removed and 3 out of 5 were out of limits. The blades were sent for repair.



January



Otago



Cabri



Ground handling

The pilot added Jet A1 to the helicopter, which requires avgas. The pilot lifted off and flew 100 metres before the engine ran rough. The pilot landed and the helicopter was wheeled back to maintenance hangar.



September



Taupo



R22



Component/system failure or malfunction

While conducting a private flight south of Taupo the occupants of the R22 heard a loud bang coming from the rear of the helicopter.

The passenger, an experienced instructor, took control of the helicopter and carried out an emergency landing. On inspection it was discovered that the v-belts had failed in flight.

Further investigation determined that the most likely cause was there was too much slack at start up, causing the lower portion of the belts to hang below the sheave grooves. As the lower sheave turns, the belt will move forward into the next groove and the actuator will begin to tension them misaligned. Then the upper portion of the belt will also get pulled over

the edge, realigning the belts. The belt will run this way for a short time with no indications to the pilot until the square edge of the sheave begins to rip the vees apart.

This comes as a timely reminder to all pilots of the importance of following the recommended pre-flight procedures as specified in the Robinson Helicopter Company Pilot Handbook including checking the position and condition of the v-belts. The presence of rubber residue, black dust, may be an indication of abnormal wear of the v-belts, any concerns should be immediately brought to the attention of the maintenance provider. It is also important to ensure that pilots make sure the blades start to turn within the recommended 5 seconds, as this may be an indication of slack in the v-belts.



September



Otago



AS 350



Other

On descent snow attached to snow shoe of dislodged, travelling rearward and impacting with tail rotor. A short, sharp vibration was felt through airframe. The engineering intervention involved removal of the tail rotor and gearbox. Replacements were fitted and the aircraft was returned to service.



January



Otago



Hughes 500



Passenger/cargo related

Whilst on a charter flight, the aircraft was descending back towards base when the right front cabin door popped open. The aircraft was slowed down, passenger told to support the door while a landing was made at the nearest point so the pilot could get out, check the door and close it again.

The door stayed closed for the remainder of the flight. The investigation determined that there were several factors that may have contributed.

- The passenger is situated against the internal door handle where any movement can disturb the handle.
- The aircraft was descending through an area of turbulence at the time.
- The cabin air vent and pilots door window were open at the time adding increased airflow into the cabin.

The investigation concluded that pilots are to remain vigilant in briefing passengers on the operation of and not disturbing the cabin doors, maintaining a cabin clear of ALL loose items, and wherever possible, the pilot being the person who physically closes and checks ALL doors to be satisfied that they are secured as they should be.