NEW ZEALAND HELICOPTER

SAFETY UPDATE

JUNE 2019

NZ HELICOPTER ASSOCIATION

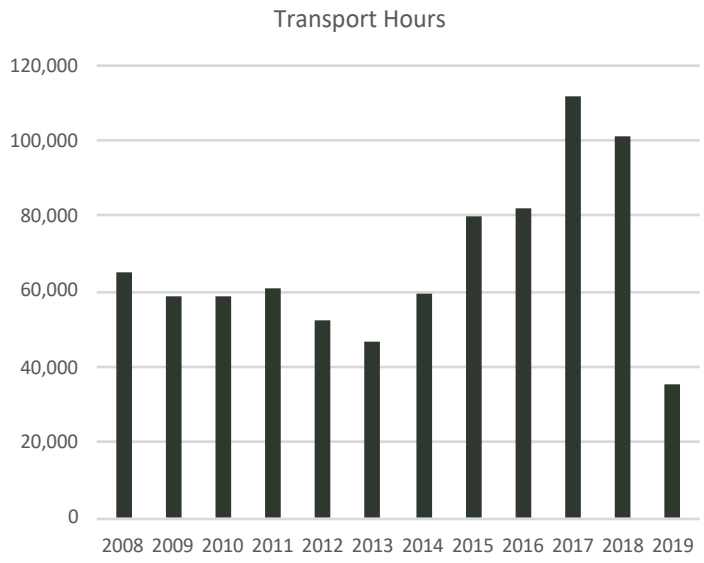
CAA
CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

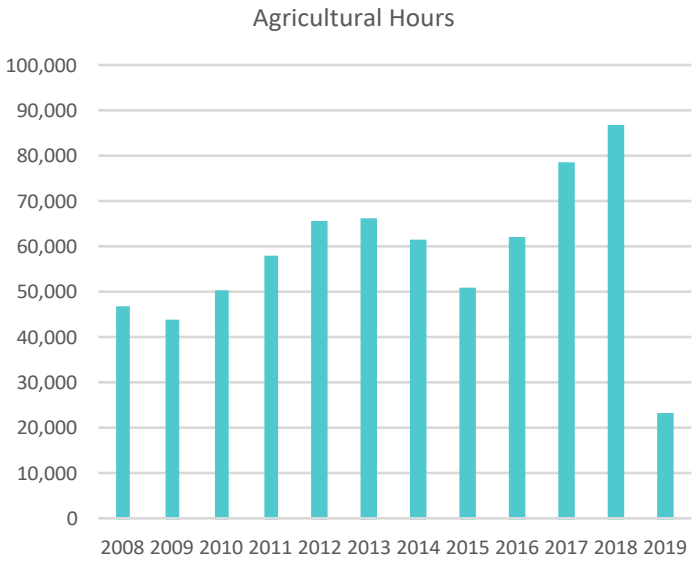
INTRODUCTION

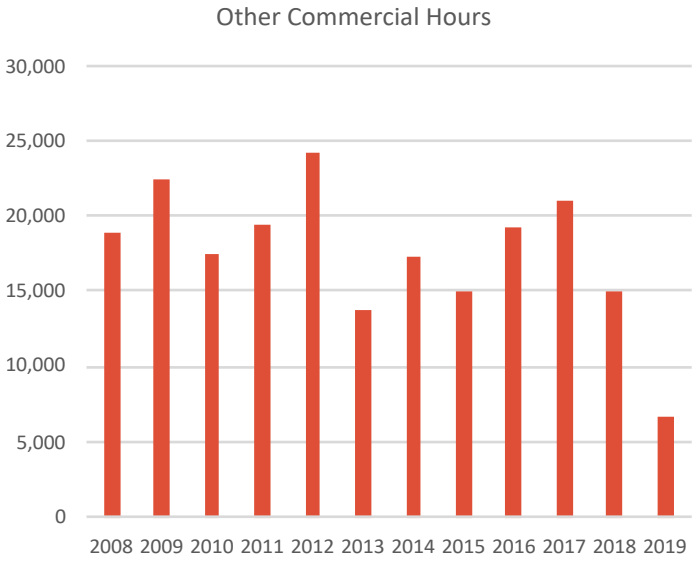
This is a further update on activity and safety performance in the helicopter sector, with activity and accident rate information current to March 2019. The report includes details of accidents and incidents for the purpose of raising awareness about risks and sharing lessons amongst the sector. If you have questions or comments about the information then please contact me at Joe.Dewar@caa.govt.nz.

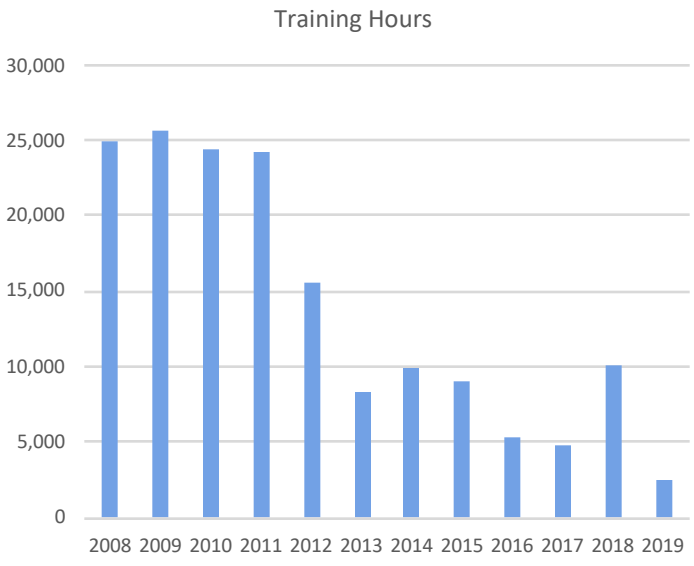
SECTOR ACTIVITY

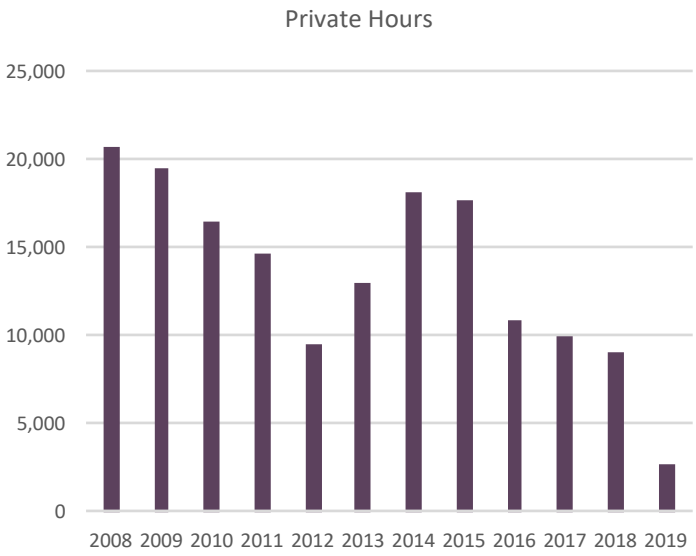
The series of charts that follow show the total estimated annual flight hours by operation type. The data show that air transport and agricultural activity has increased in the last few years, while training and private activity has shown the opposite trend.

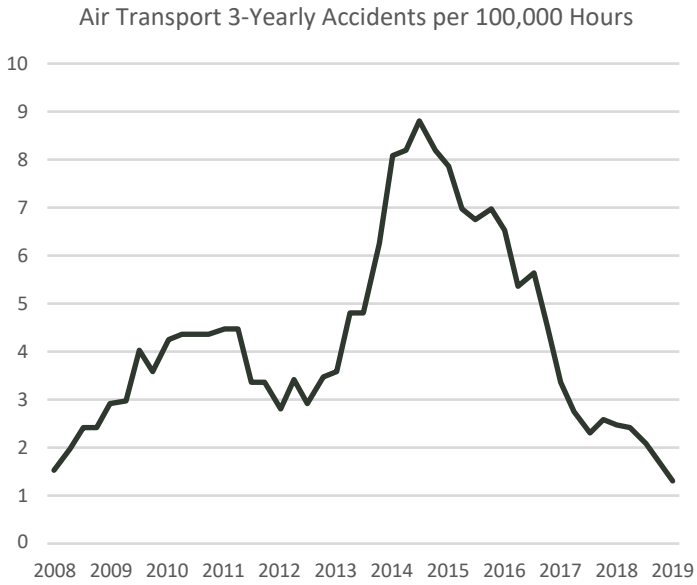






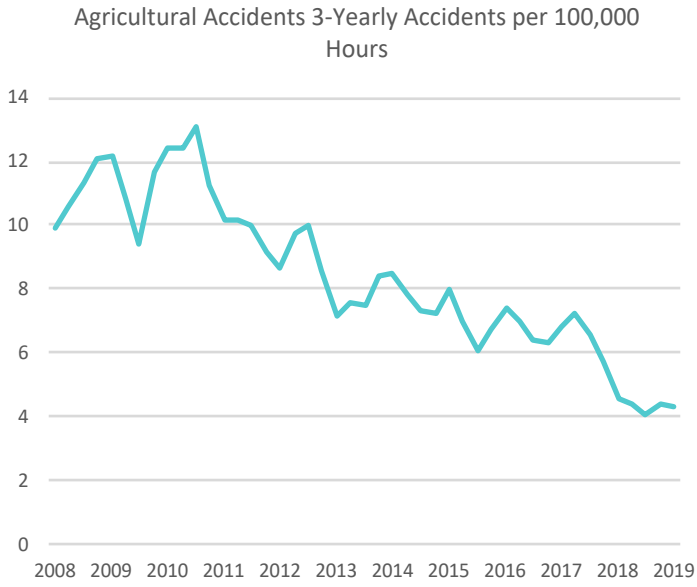


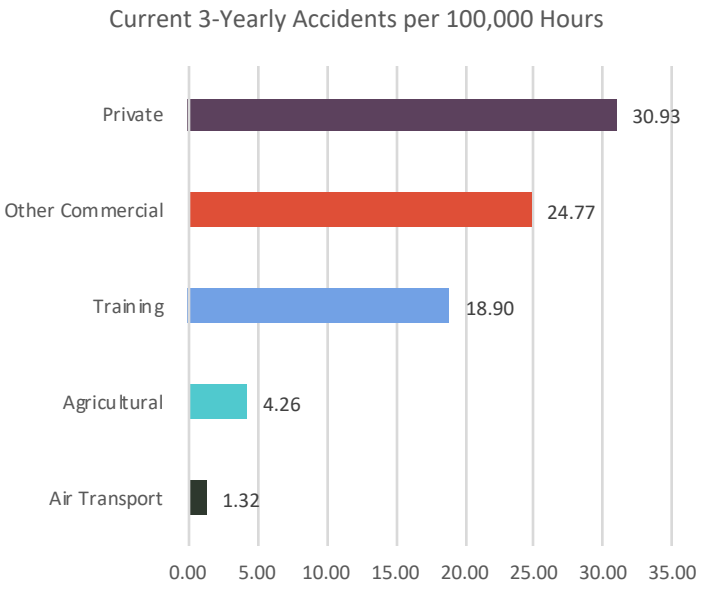


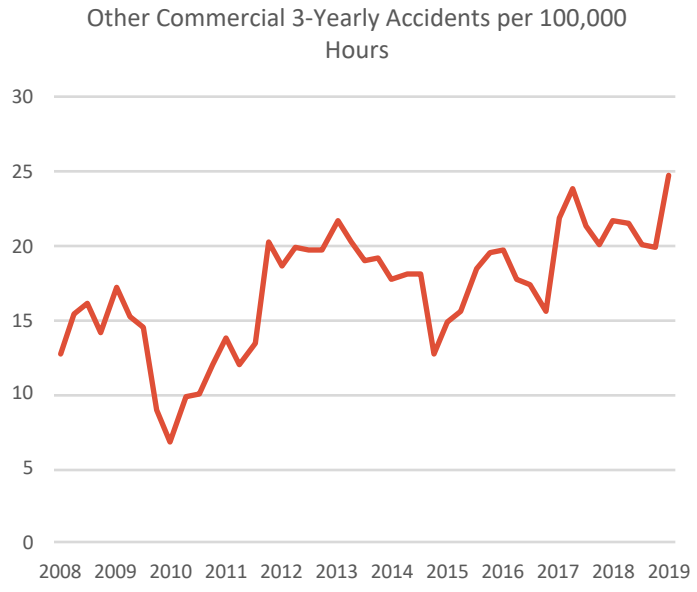


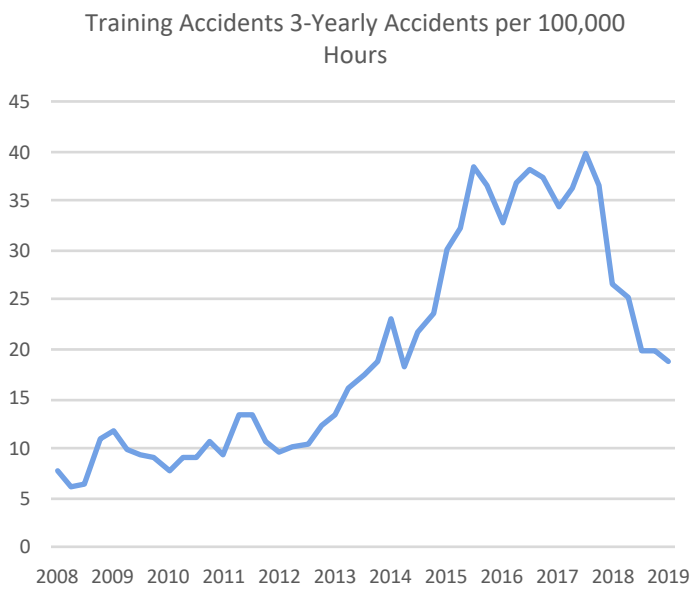
HELICOPTER ACCIDENT RATES

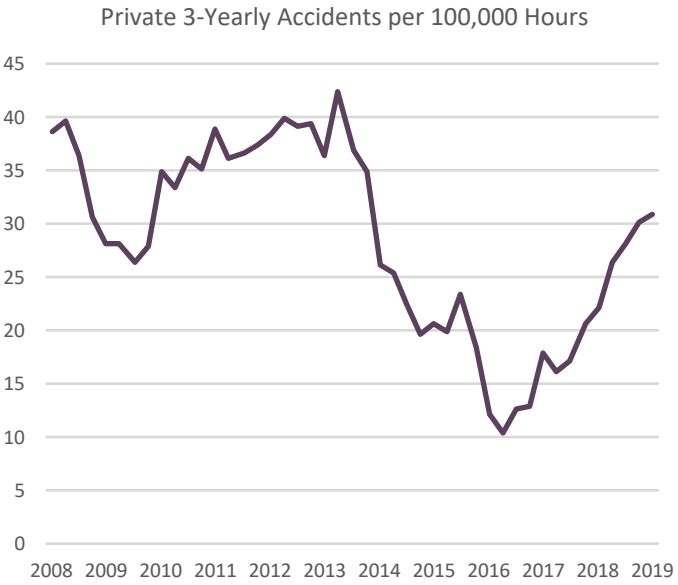
The overall 3-yearly rate of helicopter accidents per 100,000 hours, which includes all operation types, is 6.44 while the fatal rate is 1.10. As the following charts illustrate the air transport and agricultural sectors have seen a sustained downward trend in their rates, and this has recently been the case for training operations as well. Excluding private operations, the other commercial rate is the highest with a current 3-yearly rate of 24.77 per 100,000 hours.











ACCIDENT DETAILS

In 2019 to date there have been 8 helicopter accidents. 1 was on an air ambulance operation, another on a private operation, 2 on agricultural operations (both wirestrikes), and 4 on other commercial operations. Accident briefs for each are provided below.

January 2019

North of Taupo

Bell 206

Collision/strike - wire

The helicopter hit power lines and crashed while spraying. During the last load of the job and while searching for broom to spray, the aircraft contacted high voltage power lines. The aircraft rotors cut through the power lines, rendering the helicopter uncontrollable, and it subsequently impacted the ground. The pilot indicated that although he was aware of the power lines, he lost situational awareness while focused on the search for pockets of broom.

January 2019

Pacific Ocean

Hughes 500

Other

It was reported that the New Zealand - registered helicopter attempted to take off while still strapped to the deck of a boat by one line. The aircraft was unable to climb and rolled back onto the deck.

February 2019

Nelson

AS 350

External load

The helicopter was engaged in fire-fighting duties when the pilot noticed a sudden yaw to the left followed by another to the right. This was followed by a sudden pitch up. The pilot immediately jettisoned the monsoon bucket. The pilot found he had little directional control but was able to control the rate of descent down to the ground. He received an injury to one of his ankles during the ensuing accident and was taken to hospital. The helicopter suffered major damage and its tail section was severed off. The TAIC are investigating the accident.

March 2019

Northland

AS 350

Ground handling

At the end of a day undertaking DoC Track work, a ground crew member sustained fracture injuries during the loading of a bucket of gravel onto the back of a truck.

March 2019

Wairarapa

MD 600

Landing accident

While conducting a ridge top landing the pilot noticed a momentary shake in the cyclic. Subsequent inspection identified that the main rotor had contacted the tail boom and sustained some puncture and delamination damage. The operator identified that using increased aft cyclic on the sloping ground at the site may have contributed.

April 2019

Manawatu

Robinson R44

Collision/strike - wire

The pilot was conducting aerial spraying work when the helicopter struck an electric fence wire while completing the third load of the job. The pilot was aware of the location of the wire and had avoided it during the other spray runs and on previous work on the block. He managed to execute an emergency landing, however the helicopter suffered extensive damage to the front canopy, a rotor blade and during the ensuing heavy landing.

April 2019

Auckland Island

BK117

Under investigation

The helicopter was on an air ambulance flight to the Auckland Islands with 3 crew on board when it was reported missing. The 3 crew were subsequently rescued with some minor injuries. The TAIC are investigating the accident.

May 2019

Auckland

Hughes 500

Take off accident

The pilot forgot to uncouple the foot pedals before the take off. Once the helicopter became airborne it immediately began to spin. The pilot dropped the collective and a skid partially collapsed on contact with the ground.

2019 INCIDENT REPORTS

In 2019 to date a total of 45 incident reports have been received. Since we launched these safety updates and developed the CA005 for Helicopter and Agricultural Operations, incident reporting has increased year on year. It is hugely encouraging to see. When you consider that in the year to June 2013, 12 helicopter incident reports were submitted, you start to see how far many operators in the sector have progressed in terms of safety and reporting culture.

March 2019

Canterbury

Robinson R44

Door opening in flight

During an air transport operation, passengers were briefed and loaded by the pilot. A walk around was made with the passengers seated before take off. During approach to the destination point the front passenger's door opened 2-3 inches. The passenger closed the door correctly and a landing was made without incident. In their report the pilot noted that they may have overlooked that the latch and horizontal pin was in but the vertical pin was not. The horizontal pin then vibrated forward during flight eventually unlatching the door.

March 2019

Otago

Cabri G2

Ground handling

The pilot lifted off with the fuel tanker hose still attached to the helicopter. The pilot lifted off with the fuel tanker hose still attached to the helicopter. The pilot was distracted by the change in weather and the consequent considerations around picking up the next group of

clients. As a result, the pilot lifted into a four foot hover before realising the hose was still attached. The pilot landed without further incident. A review of the current refuelling SOP has been carried out and subsequently updated.


January 2019


Central North Island


AS 350


External load

After completion of flying a concreting operation, it was reported to the pilot by the customer that a piece of concrete laying equipment had fallen out of a purpose built flying box while being flown from concrete site to base area. The flying box belonged to customer and had been loaded and hooked on by the customer.


February 2019


Rotorua


AS 350


External load

The operator reported that they were survey flying at low level with an under slung magnetic loop. The target altitude of the magnetic loop was to be 35m above ground level. They reported that as they approached the eastern side of a range the loop struck the top of a Rimu tree resulting in damage to the loop on the front left side. An assessment of the loop inflight was conducted and a decision was made to return to the landing site for repairs.


January 2019


New Plymouth


Cabri G2


Pasenger/cargo related incident

At the conclusion of a scenic flight, the front passenger misjudged their exit and fell out of the helicopter. Ground crew was in the right position to arrest the fall and no injury was sustained by either party. The helicopter was shut down at the time.


January 2019


Fiordland


Hughes 500


Take off incident

During lift off the rotor wash opened the lid of a nearby wheelie bin and sucked out the plastic bin liner into the air. The bin had been placed with the opening away from the machine against the side of a hut. To prevent reoccurrence the bin was subsequently removed from the operational area.


January 2019


West Coast


AS 350


Tail rotor strike

While landing at the heliport, the tail rotor of the helicopter made contact with the uppermost fronds of a cabbage tree on the heliport's southern perimeter. Due to some miscommunication and absence of other cues to the pilot, the aircraft continued to be flown throughout the day. There was no indication of issues. The tail rotor and tail rotor gearbox were removed for inspections with spare replacement units installed and aircraft returned to service thereafter.


March 2019


Central North Island


Hughes 500


External load

On the last load sowing seed while the pilot was following the fence line, he did not allow enough height to clear some poplar trees, and the bucket collided with the top of one of the trees. The helicopter was landing back at the loading site from an inspection of the bucket. Apart from a few twigs around the bottom of the bucket, there was no damage sustained.

The operator's investigation determined that a key cause of the incident was pilot distraction. There had been a sequence of events preceding the event which led to this, including the helicopter being returned from maintenance with a hot mic being constantly active, and the pilot's headset jack failing (leading to no comms with ground crew).

Furthermore there had also been some minor bucket issues on the previous job, and there was not enough product to complete the job the pilot was working on. The farm manager had advised the pilot to go ahead with the product provided. The manager also called not long after to advise the pilot to change the spreading rate to allow the product to cover the area required. During this time the light bar in the helicopter failed resulting in the pilot not being able to see what lines he had previously taken. These factors set the conditions for the distraction and loss of situational awareness that led to the incident.


January 2019


Nelson


Bell 206


Landing incident

The pilot was carrying out a power-on landing at a remote site to unload 4 DoC workers. The 4 crew were out of the machine and were unloading gear from the luggage compartment when, due to the change of weight and CoG, one skid slipped off an unseen rock. This required the pilot to execute a quick lift off to stabilise the helicopter, before resettling the aircraft so the crew could continue unloading. The operator's report noted that incidents of this type were an important consideration when carrying out drop offs and pick ups at remote landing sites.


March 2019


West Coast


AS 350


Ground handling

During refuelling, with the engine running and the flight controls unattended, a dog owned by one of the team

members jumped inside the helicopter and landed on the fuel control lever pushing it to flight idle. The sudden noise change alerted the staff member conducting the refuel (a commercial pilot) who entered the cabin and moved the fuel control lever back to ground idle.

March 2019

West Coast

AS 350

Passenger/cargo related

This incident involved a passenger unlatching the collective lever while the aircraft was at ground idle. The pilot had vacated the pilot seat to attend to the LHS short aft door opening. The collective lock was secure with collective friction on. The first PAX was loaded into the front seat as was two other PAX into the rear seats. A second PAX was then loaded into the second front seat, at which time the PIC believes the first front seat PAX assumed that only one person would be in the front dual place seat so attempted to move across into the pilot seat. It is likely the first person's seatbelt was not yet done up. When the pilot saw this happening, he immediately ran around to the pilot seat. While the passenger was attempting to move across she used the collective as a handle causing the collective lock to release. The pilot was able to get to the collective/ controls before she moved back to her seat ensuring the situation was brought to an end.

January 2019

Canterbury

AS 350

Cargo hook - defect

During agricultural fertiliser operations the pilot took off on the final load, with a bucket carrying 500kg of urea. As the pilot went through translation, approximately 20 - 30 feet agl, an upwards surge was felt, with a subsequent loud bang and tug down on the collective. The pilot took the pressure off the collective, looked in the mirror and saw that the bucket was no longer attached, with the hook dangling on its own cable. The pilot returned to land, keeping the hook in view at all times using the mirror. On shut down the pilot also found a 40cm rip in the belly cover caused by the hook cable being pulled during the incident. Upon further investigation it was found that the cargo hook universal joint had failed. Corrosion and fatigue cracking originating from around the bush on one side of the joint assembly has caused one side of the joint assembly to fail. The other side failed under the increased load. The maintenance provider has replaced the universal joint assembly and a 12 month NDT inspection has been implemented.

February 2019

Auckland

AS 350

External load

On exit from a filling pond with fire bucket attached, the bucket contacted a bank and cracked two welds on the frame. The operator's report identified that the cause was that the pilot was not monitoring the load on the climb out, and instead was focused on their instruments.

March 2019

Nelson Lakes

Hughes 500

External load

The helicopter was performing DoC work in the National Lakes National Park. On lift off with an underslung load, the fadge failed and the strops broke. The operator identified the DoC ground crew's external load training and experience as a causal factor, and determined to ensure that trained personnel are used in future external load operations, with operator oversight of training when the helicopter company's ground crew are not present.

March 2019

Nelson

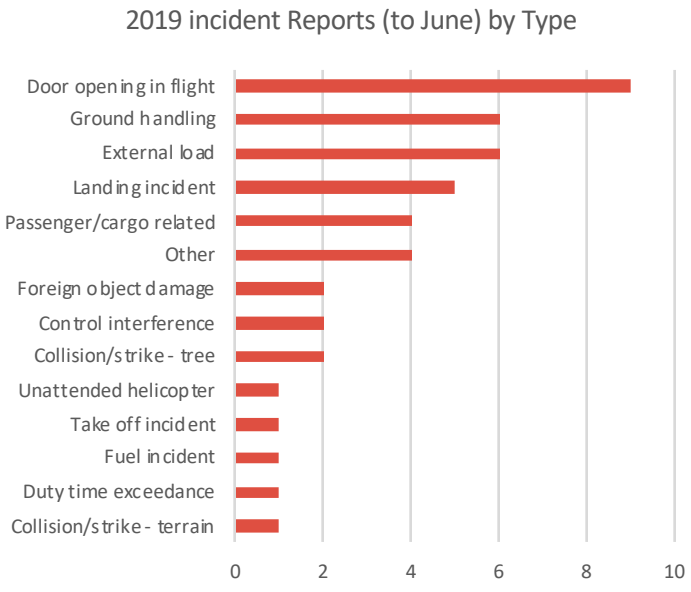
Hughes 500

External load

On external load operations approximately 1 NM flying down the valley in the cruise, the net load detached from the lifting strop and fell to the valley floor. The strop was still connected to the remote hook. Inspection determined that the strop was not choked correctly to the net and pulled through, releasing the load. The primary cause was determined to be the incorrect stropping technique of the net load by an untrained 3rd-party customer. The operator undertook to ensure that client ground crews were trained in external load operations.

2019 INCIDENT REPORTS BY TYPE

The chart below shows the total number of helicopter incident reports received in 2019 to date by incident type. The top 3 incident types have been doors opening in flight, ground handling, and external load incidents.



2019 DEFECT REPORTS

There have been 104 helicopter defect reports received in 2019 to date. Details of some of the reports are provided below.


June 2019


Auckland


AS 355


Fuel union

The pilot and crew noticed a strong fuel smell in flight when the aircraft was in different attitudes, so a precautionary landing was made and the aircraft shut down. Fuel was observed draining overboard from the right hand engine deck drain pipes. The pilot opened the right hand engine cowl and with boost pump selected on fuel was leaking at a very high flow rate from the cracked union. Engineering investigation found that the union from the engine driven fuel pump to the differential fuel pressure switch was cracked. The union was replaced and a functional check carried out of the fuel system with boost pump operating and engine operating. No further leaks were observed.


May 2019


Southland


Hughes 500


Fuel cap

During a mustering a operation the fuel cap came out despite being correctly fitted. It remained attached to the aircraft by its safety chain. It was still in the closed position.

The operator suspected that the aircraft cap housing has worn to allow the cap to fall out, as the cap is relatively new. Also there are no indication marks painted on the cap and ac to ensure it is in the correct position. The pilot placed the cap on with the latch facing backwards as normal but it is the first time it was come off.


April 2019


West Coast


AS 350


Cargo hook

There was a lifting hook failure as the load came on. The manual release cable was found to be attached with the wrong size clamps, causing pinching of the cable, and cable routing was incorrect. The cable P clamps were replaced with correct size, hook and knuckle removed and inspected and NDT (dye penetrant) carried out on cargo hook parts. The cable was rerouted and installed correctly, and tested satisfactory.


February


White Island


AS 350


Tachomatic box

Approximately three miles south of White Island, the pilot felt the helicopter suddenly yaw, and experienced

a loss of engine power. The pilot lowered the collective, but soon realised that it was a minor power loss. NG was observed to be at 100%. The power available was sufficient to continue to the Island. The cause was determined to be the failure of the tachomatic box. The operator sent a second helicopter to collect the passengers and after discussion with the maintenance provider, the helicopter was ferried to maintenance for repair.


February 2019


West Coast


Hughes 500


Main rotor

A post flight inspection revealed trailing edge delamination extending from the blade tip, inboard for approximately 15 inches. The blade was removed from service and shipped to a repair facility to determine if repair is feasible.


January 2019


Otago


Hughes 500


FCU

At completion of a 300 hour check the helicopter was released for operational flight check. The aircraft lifted into a hover taxi, as power was applied the rotor and engine rpm dropped and the helicopter landed with the RPM still in the green. A second attempt made with the same result. Subsequent investigation sound that the fuel control lever was not making its full range of movement due to the end of the attaching bolt of the FCU lever and control rod contacting an oil line at the top of the range of movement. The bolt was then reassembled and a subsequent rigging check found proper movement and ability to reach the lower and maximum stops. Flight check carried out satis.


March 2019


Canterbury


Hughes 500


L/H rear strut

On landing upon the trolley the pilot heard a crack, followed by sink of the left rear skid. The pilot lifted to being light on the skids, engineer secured the aircraft. The aircraft was placed back on the trolley and shut down. The LH Rear strut is attached to the centre keel by a NAS 6205-16 bolt, a brace assy is attached to the strut by a bolt through a spacer that is inserted through the strut assy. The rear strut had completely ruptured around the brace attachment. Due to the unknown movement of the skid gear on landing all remaining struts and all braces have been removed and sent for NDT. All attachment bolts will be replaced with new on reassembly.


March 2019


Auckland


AS 350


Main rotor bonding lead

During shutdown, the pilot reported a creaking noise from the main rotor. On inspection, one of the droop stirrup nuts had come off and allowed the main rotor bonding lead to come loose. The end of the bonding lead had been caught in the droop stop and damaged the terminal end. A new bonding lead was fitted and all nuts were replaced.


January 2019


Hawkes Bay


Hughes 500


Cargo hook

The cargo hook failed as the pilot was carrying out an external load operation with around 780kg of beehives. The helicopter and hook were sent to maintenance for inspection and repair/replacement.


May 2019


Central North Island


AS 355


Anti-vibration absorber

After 1.2 hrs scenic flying, engineers carried out a main rotor re-torque after 8 hours flight time from 150 hour inspection. During the re-torque the anti vibration absorber was found to have loose bolts with two missing causing blade damage.


January 2019


Otago


Hughes 500


Fuel system

During inspection of the fuel tanks and fuel boost pump approximately two metres of red insulation tape was found wrapped around the fuel boost pump along with a piece of plastic pipe approximately 150 mm long and 40 mm in diameter lying in the base of the tanks. It is suspected this has come from a fuel can or funnel during refuelling operations in the field. The objects were removed and further inspection carried out to ensure no further contamination.


March 2019


Nelson/Marlborough


EC 120


Other

After take off and during the transit into flight, the pilot recognised that they had had limited power, approximately 60%, and the machine was temping out. The pilot landed and another helicopter was used for the flight. Engine indicating high T4.5 Temperatures, further troubleshooting was carried out, and found the T4.5 Conformation Box with very high resistances when compared to the Engine Module M02 Log Card. A new T4.5 Conformation Box installed.

May 2019

Canterbury

Cabri G2

Other

An oil leak was noted during a ground run post a 500 hour inspection, and an immediate shutdown followed. The investigation determined that after muffler and support bracket repair, at re-installation the flange nuts were only done up finger tight, then overlooked when attention was diverted to another task. Movement of the unsecured exhaust bracket allowed the oil to exit the engine.

June 2019

Otago

Hughes 500

Door

During bee hive operations the rear left door came open while on approach to land. It is suspected that the door had not been latched correctly, and due to a pressure difference during the approach to land the door came open. The training manager discussed the incident with the pilot. The door latches were checked to ensure they were functioning correctly and additional training was carried out with the ground crew prior to any further operations.