NEW ZEALAND HELICOPTER

SAFETY UPDATE

JULY 2020

NZ HELICOPTER ASSOCIATION

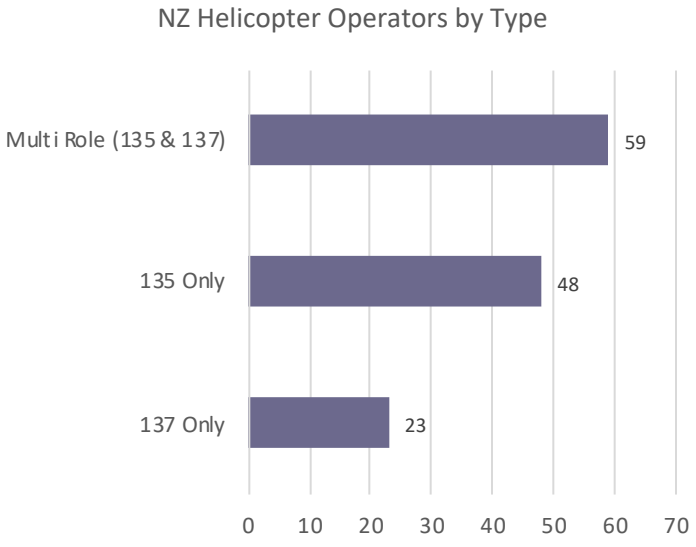
CAA
CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

INTRODUCTION

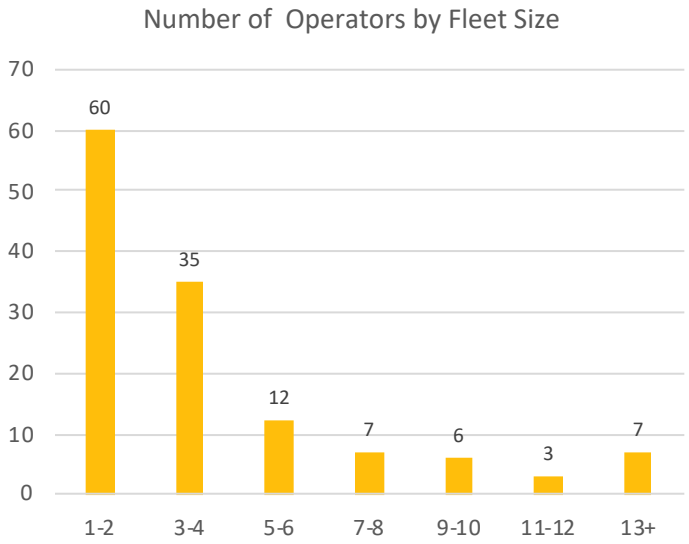
This is the first update on activity and safety performance for the New Zealand helicopter sector for 2020. My apologies for not preparing and distributing the usual update for the first quarter – this was due to disruptions associated with Covid 19. As usual, the report includes details of accidents 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 PROFILE AND ACTIVITY

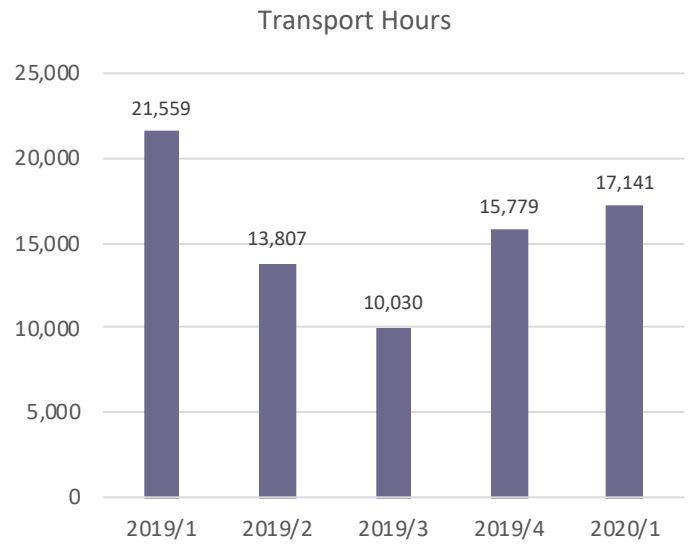
In the air transport and agricultural helicopter sectors there are currently 130 active operating certificates. The largest category of operator type is holders of 135 and 137 certificates.

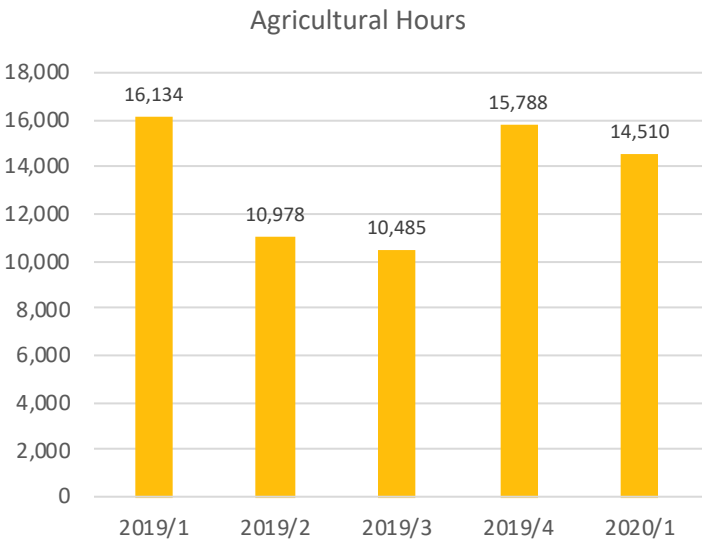


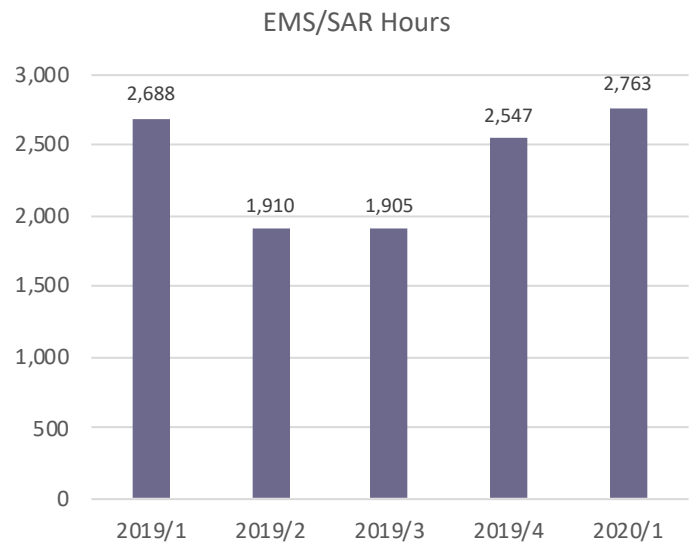
The majority of operators in the 135 and 137 sectors are smaller operators with 1-2 or 2-4 machines.

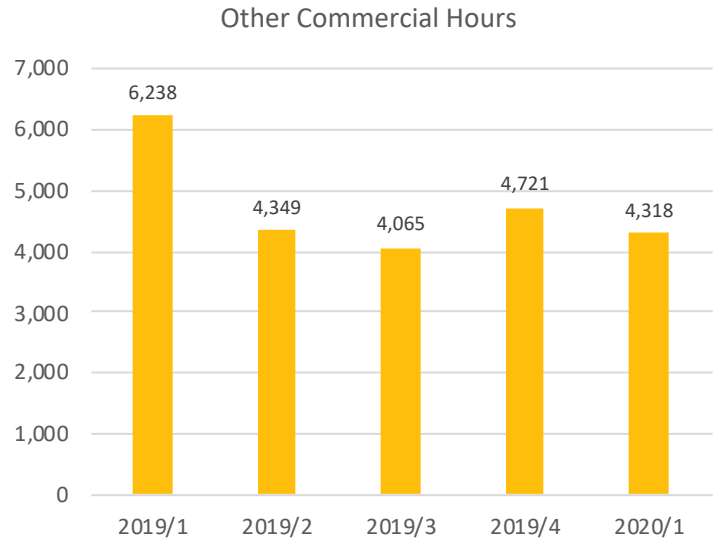


There has been a lot of interest in activity levels given the Covid outbreak. The charts below show the reported hours by activity type up to the end of March 20. Most of the interest is in activity over the last three months, including the Level 4 lockdown. **Please complete your statistics return for the most recent quarter as soon as possible - the request for this went out to operators late last week via email.**





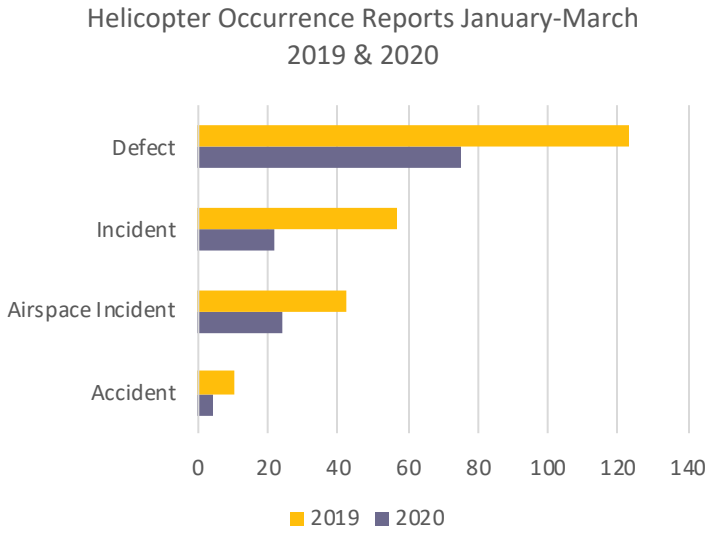




Based on this data, the only commercial helicopter operation type that has shown similar hours for the first quarter of 2020 compared to the first quarter of 2019 are EMS/SaR operations. The reductions for the other sectors from the previous first quarter are bullet-pointed below.

- 4,418 fewer transport hours
- 1,623 fewer agricultural hours
- 1,920 fewer other commercial hours

I will not be able to give an update on the activity over lockdown until the activity statistics for the most recent quarter have been returned. Again, please do this as soon as you can. In the absence of activity data for the last 3 months, one indicator that we *do* have for activity is the number of occurrences for the helicopter sector. The chart below compares the number of occurrences for the January-June period for 2019 (yellow) with 2020 (purple). As you will see there are significant reductions here. Please remember that this is a very loose measure of activity, and that it has never been more important to report occurrences so that updates like this one can continue and that we can continue to identify, track, and raise awareness of issues during this very uncertain time with the new risks that will emerge.



ACCIDENTS IN 2020

There have been four helicopter accidents in 2020 to date. In the same time period for 2019 there were ten. Of the four, two were on external load operations and two were on wilding pine control work. Details of the accidents are below.

January

Taupo

AS 350

External Load - Tail Rotor Contact

The helicopter was engaged on beehive slinging operations. On takeoff from the staging area, the pilot was not aware that the long line was connected to the helicopter. The long line contacted the tail rotor and the helicopter crashed. The pilot sustained serious injuries and the crewman on board sustained moderate injuries. The investigation report stated:
“A number of factors contributed to the accident, the main root cause identified was that clear verbal communication was not used regarding the connection of the long line.” Image of the TR below.

Hawke’s Bay

AS 350

Loss of Control - Performance Management

The aircraft was engaged on wilding pine spray operations. As a result of the helicopter’s low speed and the variable wind conditions at the time, tail rotor control was lost and the machine crashed, ending up on its side in a clearing with substantial damage.

May

Nelson/Marlborough

Hughes 500

Main Rotor Blade Strike - Terrain

During a wilding pine clearing operation, the main rotor blades came into contact with terrain on the final load of the job. Following the main rotor strike, the pilot was able to safely land the helicopter.

June

Canterbury

R22

External Load - Tail Rotor Contact

The helicopter crashed after the lifting strop contacted the tail rotor in flight. The strop had been wrapped

over the tail boom after the helicopter was landed and the pilot took a break. A pre-flight walk around was not completed prior to taking off again.

OTHER INCIDENTS AND DEFECTS IN 2020

Details are provided below of some other significant incidents and defects reported in 2020 to date.


March


West Coast


Bell 206


Loss of Control - Performance Management

The helicopter was conducting a spray run. Shortly after lift-off, the helicopter sank into the crop. The starboard spray boom came into contact with the crop and ground and was broken off.

The operator advised that a combination of factors led to the occurrence. The wind was reported as variable. The previous spray run had taken off to the north after a period of departures in a southerly direction. Prior to the occurrence spray run, the pilot had walked out into the paddock to determine the wind, which was reported to be a south-westerly of 3-4 knots. The pilot decided to take off to the southwest and did so, however, in the short time between making the decision and taking off, the wind appears to have swung back to a more norwesterly direction. The takeoff was made in a tall crop paddock. Tall crops diminish ground effect. The combination of the small tailwind and reduced ground effect led to the helicopter sinking after lift-off.

The operator advised that the occurrence was discussed by all staff and management immediately afterwards, and again at the March safety meeting.

It was agreed by all that the wrong loading site had been chosen due to the height of the crop at the time. Due to the reduction in ground effect that occurs in this situation, the operator determined that future operations would not occur out of loading sites where this may be a factor. The Safety Manager also advised that they have diarised a reminder for January 2021 to ensure all personnel maintain an awareness of this.


March


Nelson/Marlborough


AS 350


Ground Handling

The pilot door of the helicopter was removed for the operation and placed on the ground. Subsequently it was run over by a vehicle. The operator identified a number of causal factors including:

Human Factors:

- Communication between pilot and ground crew
- Lack of formal policy on storage of doors when removed from aircraft in field of operation

Organisational Factors:

- Lack of formal policy on storage of doors when removed from aircraft in field of operation

Lessons Learned:

- Improved communication between pilot and ground crew
- Importance of situational awareness when in the field
- Requirement for formalization of a basic company policy on storage of doors when removed from aircraft in field of operation
- Large Hi-vis bag being manufactured to store pilot door when removed in field of operation

May

Southland

R44

Main Rotor Blade Strike - Tree

While on a boundary run on agricultural spray operations, the pilot inputted right cyclic to come on line. This input caused the right hand tip of the spray boom to contact a willow tree. The pilot landed and found that the carbon spray boom had cracked around the contact point.

May

Central North Island

Hughes 500

Oil System - Maintenance

Pilot landed to find oil splatters over the cowl doors. The helicopter had flown approximately 3 hours since return to service from a compressor change. On opening of the cowl doors the pilot found two nozzles that were meant to be lock wired not completely closed which allowed the oil to leak. Engineer confirmed this was the cause. Pilot refilled oil and closed nozzles. The investigation report identified several human factors elements relating to maintenance. The report noted: *"Human factors weigh in heavily with this incident. One of the engineers would normally carry out the work, and the senior engineer would check it afterward, this time the senior helped to speed up the turnaround time and they both missed the drain blanks being correctly fastened. There was no apparent oil leaking during the ground run and no leak on post flight check. Normally one engineer would carry out the work, while a senior engineer would check this work. In an attempt to speed up the turnaround time (stress factor) both engineers worked on the aircraft at the same time. Subsequently both who had been working on the aircraft missed the drain blanks being correctly fastened".*

Image below.

May

Otago

BK117

FOD

Due to recent rain the tow tractor seat was soaking wet. An orange cover was placed over the seat so the pilot would not get wet. The pilot forgot to remove said cover, as the helicopter lifted off the trolley the cover was blown off the seat and came in contact with the main rotor blades. The Helicopter was landed immediately and shut down. Engineers made a thorough inspection, no damage found, and helicopter released to service.

May

Tararua District

AS 350

Cyclic Friction

The pilot reported leaving the helicopter running at ground idle to inspect the fertiliser bucket. Heard an unusual noise, looked up and saw rotor disc had tilted back. Pilot re-centred the cyclic, insufficient cyclic friction. Engineers called to inspect. MR Droop Stops took majority of the force, and found bent, one cracked. Droop stops and all main rotor hub bolts to be replaced.

March

West Coast

AS 350

External Load

External spreader bucket operation. New strops (synthetic) with jacketed covers, velcro secured had been fitted to the spreader bucket and this was to be the first job with these new lines. The previous lines had time expired. On the first load out the front line was noted by both pilot and crew to be fluttering/ vibrating. This sometimes happens with jacketed lines as they can catch the airflow and flutter. Carried on to the block but the bait would not sow so returned to the load site to rectify. Heading down the valley a thump was felt and looking at the mirror pilot could see that the jacket had ripped about 1m up from the bucket end. The velcro had undone and the cover was trailing back towards the tail. Aircraft slowed and continued back to the load site where the cover was removed.

March

West Coast

Hughes 500

Door Opening

While on long finals to land on snow, front passenger door popped open. Pilot slowed aircraft, briefed pax and checked no loose items in the cabin, then continued final approach to land on snow. After landing and talking to the passenger at the door, it seemed likely that with her leaning forward and a jacket rolled around waist had caught and lifted the latch.

March

Central North Island

Bell 206

Door Opening

As the pilot was turning onto his approach to land his pilot's side door popped open. The pilot had noticed lately the door latch moving slightly to the open position and sometimes the top latch popping open. He usually noticed this happening and was able to move the latch into lock position. This time it gave him very little sign that it was moving and popped open to his

surprise. The pilot communicated to the passengers on board what had happened and debriefed before they went their separate ways.
The pilot managed to close the door while in flight. The aircraft is 5hrs away from service so will get engineers to take a close look at latching mechanism to repair or replace.

February

Otago

Hughes 500

Maintenance

It was found the RH side inspection panel had lost screws due not being tightened correctly. The panel has 8 screws, 5 of which were lost due insufficient tightness. The panel was still held in place but had come away from the adjacent panel by 10mm so the pilot noticed it during the post flight checks. The screws were replaced and maintenance staff made aware to carry out correct maintenance practices.

February

West Coast

Hughes 500

Maintenance

Following a flight after a 300 hour maintenance check, a torch was found behind some wiring in the engine bay, after the engineer called asking the operator to check for the missing torch. The operator approached the maintainer about the incident, evidently the personal tool check was carried out after the helicopter left the maintenance hangar. The operator also undertook to remind pilots via a memo of the importance of carrying out thorough pre-flight inspections following maintenance. Image below.

January

Waikato

BK 117

Window

The crewman was sitting in the co-pilots seat during a transit EMS flight. Approximately 5 minutes into the flight, the crewman attempted to close the sliding window on the LH forward door, at which time the

window broke through the horizontal axis and fell from the aircraft. The crewman managed to recover the remaining third of the window and bring it into the cabin. The piece of window that fell may have fallen in a residential area.
It appears the window has broken in the rough area where the window catch is attached to, and there are a few small cracks in the plexiglass.


June


Ruapehu District


Hughes 500


Maintenance

While conducting low level spraying operation the pilot noticed smoke coming from out from the cyclic area/ beneath their seat. Power was switched off and an emergency landing executed at the loading site. On inspection, they found a pair of electrical crimping pliers under the pilot's seat. These had crossed two terminals, creating a short. After further systems checks and damage inspection the helicopter was relocated to the maintenance provider. It was found that during previous maintenance, the crimping tool had been inadvertently left under the seat while electrical work was carried out. The pilot noted that while they have always carried out through preflight inspections after maintenance, they will take greater care in questioning what has been done, if tool control has been completed, and would inspect any work where an engineer was working alone and duplicate checks weren't required. The pilot also would encourage engineers to leave covers off until inspection/ preflight is complete so difficult to see areas can be inspected.


October 2019


Near Taupo


Hughes 500


Control Interference

While getting the helicopter reconfigured for wilding pine operations immediately after company training, the pilot inadvertently left the pin that secures the duel collective control in its hole with the helicopter instead of removing it and securing it to the collective. Upon lift off they noticed collective travel was restricted by something they couldn't see. The pilot shut down the aircraft and discover the problem was the pin was contacting the duel collective cover and restricting movement.


November 2019


Manawatu-Whanganui


Hughes 500


Inadvertent IMC

While on a ferry flight for an agricultural operation the pilot encountered cloud conditions which prevented further flight north-bound. The pilot executed a 180° turn to return to the hangar which was approximately 2nm south. Exiting the turn, the aircraft climbed into IMC conditions. The pilot's report noted that poor decision making lead to them climbing for a visible gap in the cloud rather than lowering below the cloud base. Disorientation quickly set in. The helicopter exited the cloud in a nose-down attitude approximately 200ft above the ground. The pilot quickly regained control and the aircraft was landed in a flat paddock.

The pilot shared the following lessons learned:

The incident highlighted the lack of currency on both how to react if encountering IMC, and in using aircraft instruments.

It also highlighted just how hard it is to transition onto instruments in a situation of duress.

The saving grace was that the cloud wasn't to the ground. When I became visual, while I didn't have a lot of ground clearance, instinct took over and I performed a spray (reversal) turn away from the ground, and landed, shaken but safely.

Lessons learned.

Don't be too casual around cloud. I failed to prevent the aircraft climbing after the 180 degree turn, and entered the cloud. Making the wrong decision to climb for a gap instead of descending then put me into IMC.

Pilots need to maintain currency on how to react to IMC conditions and use of instruments. This needs to be done regularly with annual FCCC, ag checks, or BFR's.

I believe I complied with met minima up until the final moments, and have always been conscious of doing so.

Pilots need to stay current with relevant met minima, keep situational awareness, and have strong self-evaluation.

WIRESTRIKES

Wirestrikes remain a major risk on helicopter operations. In late 2019 there were three wirestrike incidents reported on agricultural operations.


November 2019


Rotorua


R44


Wirestrike

The pilot was spraying steep paddocks with distribution lines running through them. While doing a boundary run and spraying uphill, the pilot was avoiding spraying some trees - these trees were obscuring the power pole. The pilot report that once the wires became visible it was too late. He saw them clear the helicopter bubble, then the wires hit the mast of the helicopter. The wires separated from the nearby joiners and sprung free. The pilot landed the helicopter and contacted the company management.


November 2019


Nelson/Marlborough


Bell 206


Wirestrike

The pilot was conducting spot spray operations on a station in Nelson/Marlborough. On the fourth load of the morning he was working a face on the south eastern side of a river on the station where both the main hydro line and the Marlborough Lines network run parallel to one another off the top of the saddle, down the slope in an East/West direction and across the river, with a smaller network line being on the North side of the main transmission line. While spot spraying broom on the South side and up slope of the main transmission line the pilot spotted two plants close to the wires. A short high recon flight was carried out to determine whether there was enough room to get alongside the wires or whether it would be necessary to spray from above the wires. The pilot determined that there was enough room to get lower alongside the big wire to spray the plants. Once the plants had been sprayed another plant was spotted downslope on the other side of the big wire. After spraying the plant the pilot turned away from the big wires and started to descend down slope into the

small wire. He did not see the wire until it contacted the machine. The wire struck the front stays of the spray booms and the chin of the helicopter, missing the lower wire cutter and the toes of the skids. The helicopter backed off the wire and was landed. There was minor damage to the aircraft.


December 2019


Hawke's bay


hughes 500


Wirestrike

Wire Strike. During the first spray load of the day, at the end of a spray run an earth wire on a set of power lines came into contact with the helicopter skid. Flaring the helicopter to a hover as the wire broke at the power pole, the pilot was able to back away from the wire and land back at the load site. The helicopter was shut down and inspected for damage. Only some scratches were found on the skid fairings. All else was fine. Within 24 hours the helicopter was inspected and cleared by the aircraft maintenance contractor.

An internal investigation by the company Safety Manager has found human factors to have contributed to the occurrence happening. While the client was an existing client, the block being worked on had only been taken over by the client a fortnight before. A pre-job "recce' was done with the client on board but as the paddock was only looked at from one side, the wire concerned was not viewed up close. The wires were described as being on the road, which they were, however it was not identified that they actually swung over one corner of the paddock to be sprayed.

Lessons Learned

A team discussion was had around the best actions going forward. Everyone agreed that this was simply a random incident, the job had been approached just like any other and the appearance of the lines was a major contributing factor, as was the fact that the client had only just taken on ownership of the property a fortnight before. The pilot was incredibly lucky that their evasive action resulted in no injury and no damage to the helicopter.

Wires are a danger every day for ag pilots and the PIC during this incident has a current CRM course and just under 3000 hours experience in a Hughes 500. They were fit to work on the day of the incident. There is no feeling in the team that the Pilot concerned needs extra training in the area of wire identification or that they had behaved in a way that increased the risk of the incident occurring.

The team does agree, however, that the pre-job "recce" is the key way to identify wires in a new block and so going forward it will be company policy that a new paddock will be flown around twice before a job carried out. For this particular property – the wires have been recorded for any future work.

We will also be placing an increased emphasis on wire identification with clients, particularly new clients or clients that have acquired new blocks. Where possible we will require maps of lines on the property, especially from forestry clients who have purchased farms to convert. Wires have always been part of the pre-job hazard ID but this incident has made us realise how much we rely on the client to be informed. It's a "team" approach to wire identification – we need the client to do their complete due diligence before we come to a job to ensure the pre-flight "recce" is completely informed.