10 months into the year, this industry records 14 accidents, 6 deaths, and 9 serious injuries on its safety ledger. It’s the worst performance for a number of years, and so it’s time to take stock of where we stand.

With the total number of commercial helicopter pilots sitting at about 1300 we are doing very poorly indeed.

This is the third safety bulletin. The previous bulletins have covered CFIT accidents, passenger transport risks, and performance margins. They’ve presented to you the huge toll, both in human life and economic cost, of these types of accidents. But what have you done about it? Have you reviewed your procedures on weather planning and minimums? Have you reviewed or changed your passenger-briefings? Have you reflected on how you’re actually going to prevent having an overweight machine fly out on a job? What about your hunting or contractor work: what have you done to make sure your shooter is correctly trained? Anything? The accident data that we present to you in these bulletins have come at an enormous cost: dozens of lives lost, machines destroyed, hundreds of grieving family members left behind. We owe it to the lost pilots to discipline ourselves to the task of improvement.

### Changing face of ag work

Every year we submit information to the CAA on our agricultural operations. Here’s some data that is based on those submissions. The numbers are showing that there has been a huge increase in the role of helicopters in the ag sector. You’re probably aware of this, but the figures themselves show just how much ag work helicopters are doing now:
In 2005 we were spreading 36,000 tonnes of dry product and 51 million litres of liquid. In 2013 we spread 500,000 tonnes of dry product and 76 million litres of liquid.

The shift to helicopters in the agricultural sector is striking and it reflects some major developments in both the products themselves and our ability to carry and spread them. Partly it’s a success story, but it’s also a cause for concern. How many of you out there are properly resourced to deal with the increasing workload? How hard are you pushing your pilots to get work done? We are a crucial cog in New Zealand’s agriculture industry but it cannot come at the cost of the lives and limbs of pilots.

With ag work theme in mind, we turn to address a major accident type, wirestrikes.

November’s tragic, fatal accident near Wanganui was a wirestrike. Wirestrike accidents are the scourge of the whole New Zealand helicopter industry: every year we lose good pilots to these types of accident. And every year there are close calls and near-misses.

In 2002, Greg Whyte published the book ‘Fatal Traps for Helicopter Pilots’. On wirestrike accidents, he said this: "Some years ago a pilot in Wellington – a true hero of many rescues and well over 10,000 hours logged – was helping police track an escaped prisoner and inadvertently hovered into major transmission wires that he himself had helped erect across the gully". Experience is no defence. The simple truth is that wirestrike accidents happen when we don’t pay attention and when we don’t plan. They happen when we do jobs that we’ve done time after time and consider to be
first fatal R22 accident occurred. It was a wirestrike on an early-morning hunting mission over the Landsborough River on the West Coast. The pilot knew the wire was there: only days before he hit it, he warned both a student pilot and his shooter to be aware about the cable that crossed the river. The pilot had 5,997 hours logged.

Unlike other accident categories, experience and weather are not typically identified as causal factors in wire strike accidents. In fact, according to the FAA, the average age of the accident pilot is 43.5 years, with over 4,000 hrs of flight time. Likewise, the weather is typically good—86% of these accidents occur in daytime VMC.

The accident record shows that since the 1980’s we’ve clocked up a total 135 accidents and incidents where we’ve hit or nearly hit wires. These have led to 42 fatalities and 28 serious injuries. Unsurprisingly it’s ag work that has racked up the most:

<table>
<thead>
<tr>
<th>Flight type</th>
<th>Total wirestrikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural work</td>
<td>72</td>
</tr>
<tr>
<td>Other aerial work</td>
<td>26</td>
</tr>
<tr>
<td>Private</td>
<td>12</td>
</tr>
<tr>
<td>Passenger transport</td>
<td>8</td>
</tr>
<tr>
<td>Hunting</td>
<td>8</td>
</tr>
<tr>
<td>Surveillance</td>
<td>4</td>
</tr>
<tr>
<td>Air ambulance</td>
<td>2</td>
</tr>
<tr>
<td>Ferry flight</td>
<td>2</td>
</tr>
<tr>
<td>Survey/inspection</td>
<td>2</td>
</tr>
<tr>
<td>Freight only</td>
<td>1</td>
</tr>
</tbody>
</table>

But even though there have been so many in the ag sector, it’s really anyone that’s operating at low level that the real danger period is between 9am and 1pm.

And right now we are in the danger period in the year for these accidents: more happen in November and December than any other month:

Below is the data on the time of day that these accidents occur:

Most of them happen before the afternoon, and the real danger period is between 9am and 1pm.
Underlying factors

The data shows that it’s not inexperience, and weather conditions aren’t always a factor. It also shows that all too often it’s also not a lack of awareness of the wire location: an ATSB study showed 63% of the pilots involved in the Australian wirestrike accidents knew where the wire was in advance\(^\text{iii}\). So what is it?

Pilot attention

One major underlying factor is distraction. Distraction in a low-level operation can be deadly at any stage; from planning through to flying. Because of the close proximity of the hazards, even the smallest lapse in attention can be fatal. It is just so important to stay focused on the job at hand when you are in the air, as these accidents below show.

7:30 pm early December. Jetranger on spraying job near Hawkes Bay.

The pilot struck wires while on a slow approach to land. He had flown around 12 successful runs prior to the accident, keeping his distance from the wires each time. In the post-accident report the pilot reported that he had unconsciously turned his attention to upcoming operational tasks. The actual approach he had planned required flying in between sets of wires, so that momentary lapse in focus was enough to catch him out.

2:15pm mid-June. AS350 on power-line inspection in Canterbury.

Pilot and one passenger were engaged on a lines inspection job in Canterbury. During the flight the passenger became suddenly unwell and a landing was required. Distracted by the sick passenger, the pilot struck wires while conducting this landing and the helicopter was substantially damaged.

Getting distracted from low level wires doesn’t need to come from a sudden event. Anything that causes the presence of the wires to fade from the pilot’s awareness is hazardous:

10:14am late March. Hughes 500 on passenger transport in Fiordland.

On final approach to land at the Manapouri Dam the pilot struck the wires than spanned the West Arm. Prior to departure the operations manager had warned the pilot to “watch those wires”. 5 were killed in the accident. The TAIC investigation revealed that the pilot was probably concentrating on flying her approach and looking towards the intended landing area and away from the power lines when the helicopter flew around the base turn and struck the conductors.

Pre-flight planning

Every operator should know how critical it is to plan properly for any job, but in low-level work it takes on a special importance. It is absolutely critical that wires and other hazards are identified before the flight, and that good reconnaissance work is conducted prior to the start of the work. When it comes to ag work, this involves the property owner (or other responsible person) and the pilot working together to establish where these hazards are in each working block and how they can be managed during the job. What the accidents show are three things that can go wrong in the planning stage:
a) Landowner or worker doesn’t identify all hazards to the pilot

b) Pilot or operator doesn’t conduct sufficient reconnaissance work to identify hazards in the work area

c) All hazards are identified prior to work, but then a wirestrike occurs anyway due to factors such as loss of attention, insufficient flight planning, or poor environmental conditions.

a) It’s crucial that farmers and owners are aware that every single wire in the work area is a potential death trap. To them, wires are a normal part of the scenery they work under every day. They need to know that wires can write off a machine and kill a pilot in a second.

9:30am early February. R44 on spraying operations in Hawkes Bay.

Lining up for another spray run the pilot collected a live electric fence wire. The wire was thin, was not run from a pole, and the farmer hadn’t notified him of it in the reconnaissance flight conducted prior to the start of the job. The main blades, tail fin, and spray boom were damaged. The wire was all but impossible to see from the air.

b) When jobs arise in an area that a pilot is unfamiliar with, or if the pressure is on and it seems like there isn’t time to get high and survey the hazards down low, then disasters can occur. This is especially the case when you consider low flying in bush areas and how line poles in New Zealand can be almost impossible to distinguish from the background.

2:00pm mid-June. R44 on police surveillance flight near coastal Greymouth.

On a low-level police surveillance flight the pilot lost sight of the power lines and assumed they had begun running underground at that point. The helicopter hit the wire near the beach. There had been no reconnaissance flying conducted before the flight. Later photos showed that the power poles were almost indistinguishable against the bush.

1:00pm late November. Jetranger on police surveillance job near Wellington.

The pilot and two PAX were engaged on a short-notice task for the police searching for an escaped prisoner. The pilot observed the power lines which hung some 250ft over the gulley and he conducted a slow right turn and then entered a hover. The helicopter drifted slowly and then contacted the wires. All three on board were killed. It was determined that the pilot’s awareness of the wires was hampered by the lack of visual cues from the surrounding bush and the fact that in positioning the helicopter to search the ground area he placed the helicopter to out of his sight.

d) So often the wire that is hit will have been identified, carefully mapped-out and planned-for. Yet the pilot still hits it. It brings home the fact that all the planning in the world can be useless if you aren’t focused, or have neglected the fact that the environmental conditions might be such that your plan to ‘see and avoid’ the wire you’ve identified is impossible, because they’re all but invisible in the conditions.

5:30pm mid-December. Iroquois on spraying operations in the Waikato.

The helicopter was engaged in aerial spraying when it struck a wire and then landed heavily. The pilot vacated the machine which was then substantially damaged by a fire that broke out. He received minor injuries. Subsequent investigation found that he knew about the particular wires, but he hit them at the end of the spraying run, and while he was in a turn looking to locate another set of smaller wires that he had been told about. He lost his position with the larger wires due to being in a turn and also due to the large span of the wires across the gulley.
Resilient against the risks

As most of you are aware, reducing the numbers of wirestrike accidents has been one of the major focus areas of the NZAAA with the ‘Down to the Wire’ campaign. It’s time now to take a look at the major strategies we advocate to protect pilots, equipment, and machines from the wirestrike risk. Understanding the wire risk is fundamental.

Wires fit into a number of categories that include, but may not be limited to:

- Powerlines
- Telephone Lines
- Electric fence feeder wires
- Other overhead wires e.g. TV aerials. Flying Fox, etc

Powerlines have claimed their share of victims over the years. Single wire (earth return) powerlines create the most risk because their spans are typically longer than multi-wire lines. The big transmission lines have also caused a few accidents as we have seen. AIA did a lot of work years ago with CAA’s Ted Hawker to try and mark powerlines and for a number of reasons that project was not successful. (The biggest issue is that the lines are not built sufficiently strong enough to withstand the extra wind loading on the markers). But one aspect that reduces the risk of collision with powerlines is the predictability of their route and presence. In rural areas if you see a dwelling, woolshed, pump house etc, you can expect to see a powerline. Powerlines typically run straight but advertise a change in direction by having a pole stayed when they do turn. Cross arms are typically mounted at right angles to the line direction so a good look at cross arms will provide information to pilots.

The comments about powerlines also apply to telephone lines but there are still areas in NZ where old No. 8 wire phone lines that are now unused are still slung from tree to tree and these give no clues of their presence.

Although both power and phone lines have killed, in NZ the risk of collision with farmer run wires is far greater – especially for Ag Pilots. These wires are typically electric and the risk of collision with farmer run wires is far greater. Although both power and phone lines have killed, in NZ the risk of collision with farmer run wires is far greater – especially for Ag Pilots. These wires are typically electric and the risk of collision with farmer run wires is far greater.

NZAAA has campaigned for the last 3-4 years to get farmers to make these wires safe by tying them down to a fence so that they do not extend more than one metre above fence height. In the view of NZAAA and NZHA a farmer is in breach of HSE legislation when he runs wires higher than that. You see as the principal, a farmer has to provide a safe work place and running wires across gullies etc and then contracting pilots to carry out low level work there is providing an unsafe workplace. We put this case to CAA’s HSE Unit in 2011 and they agreed and provided NZAAA with a letter to that effect..

The “Down to the Wire” campaign involves getting all pilots to carry that letter and show it to farmers. Farmers who respond are rewarded with a certificate. One of the best resilience strategies in respect of farm wires is to remove the hazard by taking the wires down low. Pilots are the best persons to achieve this. The letter can be downloaded at http://www.aia.org.nz/site/aianz/HSE%20WIRE%20%20LETTER.pdf

Consideration is also being given to running a joint WorkSafe, CAA, NZAAA/NZHA, ACC project to get the message out to landowners.

These types of wires rarely give a pilot any visual cue to jog their memory that the wire is ahead and so they are often forgotten – assuming the pilot has been advised in the first place!

In respect of all types of wires we used to say there were two ways to avoid hitting them:

1) A systematic risk management approach that ensures the presence of wires is constantly considered.
2) Luck

But consider too the following.

- If GPS Guidance is being used then mark the wire on the screen with a dotted line or similar warning
- Break big blocks into smaller ones so that all the hazards can be remembered all of the time
• Quiz farmers closely about the presence of wires – “tell me where ALL your wires are” - and get them to certify that they have told you of ALL hazards

• **When wires are present DO NOT allow yourself to be distracted**

• Along with the other measures discussed, formal wire strike avoidance training and regular refreshers is a powerful mitigating strategy. We encourage all operators to have a policy about how often their pilots should attend some form of wire strike avoidance training. We endorse Bob Feerst’s “operating in the wire environment training that has now been adapted for the NZ environment and offered via John Fogden. **This training is recognized as world’s best practice and should be regarded by every helicopter pilot as a “must-do” training course.**

• Because you have landed somewhere before, don’t just assume that nothing has changed. Take an extra minute, do the full 360” high recon before descending, what you can’t see from one side of the pad might just be very visible in the different light conditions on the other side.

• Is a wirestrike protection system available as an option for your aircraft? If it is, have a think about installing one. If things really do go bad it might just make the difference between you talking to the investigators about “all practicable steps” or your family talking to the coroner.

• Any time you fly a helicopter with terrain or structures above your operating height you are at risk of wirestrike, if you don’t absolutely need to be there then fly a bit higher. Prudent operational decision making can eliminate wirestrike risk from a significant portion of many helicopter flights.

• If you become aware of a new wire, please make an attempt to let your fellow operators know of its existence. Yes, they might be your competitor, but a wirestrike accident reflects negatively on the whole helicopter community.

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