New Zealand Helicopter Sector Insights

Insights period: 1 January 2016 through to 1 March 2026

Key insights summary

The *commercial helicopter passenger transport sector* has experienced a low number of serious accidents over the past decade. However, occurrence reporting continues to include instances of inadvertent openings of doors, cargo pods, or cowlings. As well as passenger interference with controls (including during loading or when the aircraft is unattended). These types of events may be precursors to a fatal accident, and reinforces the need for robust passenger briefings and consistent latch verification processes.

Agricultural (ag) helicopter operations (particularly spraying) account for the greatest proportion of reported accidents and serious incidents compared with other sectors. Reporting commonly describes aircraft performance limitations being exceeded or engine failure or power loss related events leading to an autorotation and/or heavy/hard landing. Human performance factors, such as distraction/task fixation, fatigue after long operating days, and last-minute plan changes feature as re-occurring contributing factors.

Within ag and other *low-level flying operations*, wire and rotor strikes are prominent. Incidents often involve known hazards (wires, fences, vegetation) where clearances are misjudged or the operating plan changes in-flight or at the last moment. Main rotor strikes with vegetation are common in confined areas, while tail rotor contact during hover/landing reflects pilot decision making when managing limited rearward visibility and situational awareness in tight spaces.

Reporting from *external load and lifting operations* indicate that risk is concentrated in high-volume activities such as spreading/seeding, firefighting, and routine sling work (eg, transporting beehives). Contributing factors tend to again cluster around human factors or mechanical failures, such as:

- Inadvertent activation/release under task saturation or aircraft-type unfamiliarity.
- Load (role equipment) preparation/rigging and packaging integrity (incorrect attachment, mismatched hardware, equipment degradation), and
- release-system mechanical integrity (wear, corrosion, cable/mechanism issues driving uncommanded releases).

Helicopter Emergency Medical Service (HEMS) and/or night operations feature prominently in occurrences involving loss of situational awareness or spatial disorientation. Outcomes are strongly influenced by instrument proficiency and timely decision-making (eg, early escape/reversal back to base or an alternative). Navigation, vision-aid and flight control issues reinforce the importance of configuration reliability and operator discipline during higher-workload missions.

Across activity types/sectors, the occurrence data repeatedly points to the importance of the same high-level controls: training proficiency and currency, operating within performance margins, maintaining emergency/abnormal handling proficiency, managing fatigue and task fixation, strengthening ground handling and load-preparation assurances, and enforcing maintenance/tool control and duplicate checks for latches, pods, cowlings and release systems.

Introduction

Since 2016, New Zealand's helicopter sector has reported 12 fatal accidents. In the past 6 months, the helicopter sector has suffered three fatal accidents. The first in over four years.

In response to the recent fatal events, the Civil Aviation Authority's (CAA) Regulatory Enablement and Response (RER) group undertook analysis to help better understand the safety performance of New Zealand's helicopter sector by examining reported accidents and aircraft incidents over the past decade.

The analysis identified 5 areas of safety concern. These were:

1. Helicopters operated outside of performance parameters or experiencing component failure, resulting in loss of control.
2. Collision with terrain or objects.
3. Inadvertent release of external or underslung load.
4. Inadvertent openings, foreign objects and debris (FOD), and passenger interference.
5. Loss of situational awareness or spatial disorientation.

Analysis

Based on the CAA's Good Aviation Practice (GAP) booklet – How to report occurrences; we (the CAA) assume that only about two thirds (2/3) of serious incidents are reported to us. While just a quarter (1/4) of minor incidents are supposedly reported. Therefore, we believe that the total number of occurrences, and potential harm within the helicopter sector likely exceeds what is visible to the CAA.

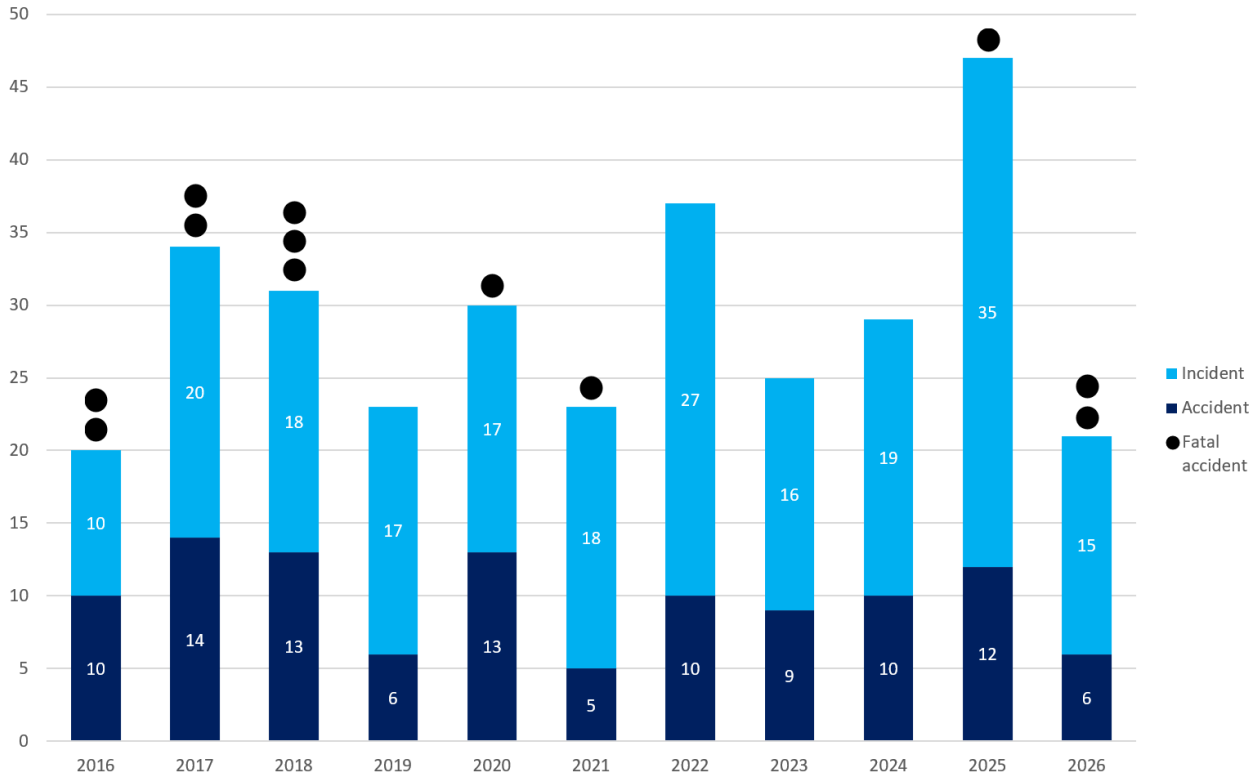
The analysis included data captured between 1 January 2016 through to 1 March 2026. There were around 6,000 total helicopter associated occurrences reported to the CAA during this 10-year time frame. Of these, approximately 300 were reported as accidents or serious aircraft incidents – 12 of these events were fatal accidents resulting in 18 deaths.

Three of the fatal accidents were private in nature, one involved passenger transport (aerial hunting), and the remaining eight were commercial (non-passenger) in nature, specifically:

- three culling/wildlife management
- two surveys
- one en-route for frost protection
- one en-route for lifting/beehive transportation
- one firefighting – external/underslung load operations.

Five of the accidents involved the death of one or more contracted, employed, or family and friend 'passengers'.

The graph below illustrates the number of annual accidents and serious incidents for the insights period, including up to 31 May 2026. The black dots reflect a fatal accident.



Graph 1: Annual accidents and critical or major incidents (2016 to 31 May 2026)

Overall, occurrence reporting indicates that the highest concentration of harm and serious incidents sits within specialised, high-workload activity types – particularly agricultural/low-level operations and external load work.

1. Key insights: Helicopters operated outside of performance parameters or experiencing component failure

- Engine power-loss events are the dominant theme. The accident/incident data set highlights a high proportion of events involving engine power loss/RPM decay or engine failure leading to autorotation, forced landing, hard/heavy landings, and sometimes rollovers.
- Agricultural (spraying)/low-level work stands out as a higher-risk operating context. Occurrence reporting explicitly links agricultural operations with low-level flying, and high-power demands.
- Helicopter type is usually associated with particular type of work (ie, right tool for the right job). Occurrences are attributed frequently to Robinsons (R44 II) and some other common utility/ag aircraft (eg, MD/Hughes series). These aircraft types are likely overrepresented due to their predominance in agricultural work, rather than an inherent issue with the aircraft.
- Training quality and pilot understanding of performance is a recurring factor. One fatal accident investigation directly attributes the outcome to misunderstanding emergency/manual modes, influenced by training. Another fatal example highlights pilot inexperience and failure to detect performance cues.
- There has been a recent upward trend in incident reporting in last 3 years (2023 – 2025).

The table below identifies common categories from critical or major accident/incident occurrence reporting where loss of control or system component failure contributed.

Occurrence categories		
Primary event category	**Count**	**Secondary event types or event causes**
Engine power loss	14	Resulted in: hard/heavy landing (4), autorotation (3), hard/heavy landing and rollover (2), autorotation and rollover (1) Caused by: fuel control unit failure (1)
Loss of control	13	Resulted in: impact with terrain (5), aircraft pitched backwards (4) Caused by: pedal jam (2), pilot incapacitation (1), aircraft was left unattended with blades turning (1)
Rollover	11	N/A
Loss of power/RPM decay	10	Resulted in: hard/heavy landing and rollover (2), hard/heavy landing (2), autorotation and hard/heavy landing (1), autorotation (1), impact with terrain (1)
Engine failure	9	Resulted in: autorotation (5), hard/heavy landing (2), engine failure (2)
Hard/heavy landing	5	Resulted in: tail strike (1), rollover (1)
Autorotation	3	Resulted in: hard/heavy landing (2), hard/heavy landing and rollover (1)
Loss of tail rotor authority	3	N/A
Engine over torque	2	N/A
Cyclic jam	1	N/A
Loss of throttle control	1	Resulted in: hard/heavy landing (1)
Hydraulic failure	1	N/A
Total	***73 critical or major accidents (46) and incidents (27)***	

2. Key insights: Collisions with terrain/objects during low-level manoeuvring

- Wire strikes in low-level/agricultural operations. Events commonly involve known hazards where clearance was misjudged and/or plans changed at the last moment; fatigue during long spray days is identified as a contributing factor in narratives.
- Main rotor strikes with trees/vegetation. Frequently associated with confined area operations and lifting, misjudgment of rotor disc clearance and changing site conditions (eg, vegetation regrowth) are recurring elements.
- Tail rotor contact during hover/landing. Often occurs when pilot attention is forward and there is a loss of situational awareness within tight landing sites contribute. Typical objects include trees, fences, and equipment at sites.
- Dynamic rollover risk, linked to skid contact/catching on soft or uneven ground and slope operations (including alpine/snow/ice conditions) when a lift vector/collective is applied.

The table below identifies common themes from all helicopter occurrence reporting where the description indicated that the helicopter had struck an object or terrain. The type of object that was hit, and by what component of the aircraft was also looked at.

Objects struck		
Object type	**Count**	**Description**
Terrain/ground	79	Collision with terrain, hard landings, ground contact, hillside impact, slopes
Trees/vegetation	42	Rotor contact with trees, branches, scrub, willows, pines
Other/unspecified	35	Multiple or unspecified objects
Wires/power lines	30	Wire strikes during ag work and low-level operations
Buildings/structures	15	Hangar doors, helipad structures, sheds
Vehicles/equipment	14	Loaders, cranes, trucks at load sites
Runway/helipad	10	Runway excursions, helipad contact
Water	9	River, lake, or sea contact
Fences	7	Farm fences, fence posts
Beehives	1	Beehive contact during hive operations

Aircraft components involved in strikes		
Component	**Count**	**Description**
Main rotor blades	69	Most common – strikes with trees, wires, equipment, terrain
Other/multiple	64	Fuselage, multiple components, or unspecified
Tail rotor	55	Contact during hover/landing with trees, fences, terrain
Skids/landing gear	25	Wire catches, soft ground, uneven terrain, dynamic rollover
Spray equipment/booms	13	Agricultural booms contacting ground, trees during spray runs
Tail boom/stinger	9	Tail contact with ground during slope landing
Longline/hook	5	External load cables fouling trees or structures
Windscreen	2	Object strikes through cockpit glass

3. Key insights: External load events (including inadvertent release and secondary tail rotor or boom strikes)

- Risk concentration is evident in high-volume lift activities – agricultural spreading/seeding, firefighting and general sling work.
- Dynamic flight/operational effects can turn a precursor into a tail rotor strike or secondary hazard. Events include longlines/loads contacting the tail rotor/boom, loads spinning and creating forces that can “self-jettison”, and lines fouling aircraft components (eg, skids) during take-off or after jettison.
- Human factors: inadvertent activation and control interface contribute to load release events. Reports include pilots pressing the release button in error under task saturation/distraction or due to aircraft-type unfamiliarity.
- Rigging/attachment quality and load packaging failures are persistent precursors. Occurrences include improper attachment (keeper not engaged, mismatched hardware) and rigging/packaging failures (strops/nets/loops failing, UV damage, sharp edges cutting strops). Ground handling controls matter: duplicate checks, supervision, and minimum standards for load preparation and equipment life/condition.

- Mechanical integrity of release systems is a recurring driver of uncommanded releases. Occurrence categorisation highlights uncommanded hook release (eg, mechanism failure, corrosion/wear, cable issues) as a leading cause of inadvertent loss of load.

The table below identifies common themes from all helicopter occurrence reporting where the description indicated an inadvertent release of an underslung load, or where the tail boom/rotor had been struck during external load work.

Occurrence categories		
Category	**Count**	**Notes**
Inadvertent release of underslung load *(see cause categories below)*	78	Loads released from hook/longline unintentionally
Tail rotor/boom strike during external load ops	12	Tail contact with lines, cables, or equipment during lifting
Total external load-related occurrences	***90***	***Combined total of both categories***

Inadvertent release – cause categorised		
Cause category	**Count**	**Description**
Uncommanded hook release	22	Hook mechanism failure, corrosion, wear, cable issues
Pilot inadvertently pressed release button	14	Wrong button pressed, task saturation, distraction
Improper rigging/attachment	12	Load not properly secured to hook, keeper not engaged
Equipment/component failure	11	Load cell failure, strop failure, cargo swing failure
Load/packaging/rigging failure	10	Net failed, strops failed, bags tore, items fell from load
Spinning load causing release	4	Rotating load creates forces that release hook
Manual release cable actuation	5	Spreader bar or load contacted manual release cable

4. Key insights: Inadvertent door openings or window failures, and foreign object/debris (FOD) hazards

- Latch integrity, maintenance standards, and pre-flight assurance are central to preventing inadvertent openings. Fatal and precursor events show that worn or poorly secured latch mechanisms can allow doors/windows to open unexpectedly in flight. Occurrences indicate increased vulnerability when doors are closed by ground crew or third parties (under time pressure) and pre-flight checks do not reliably verify latching and security.

- Passenger and cargo management failures. Incident reporting includes passenger interference with controls (including while loading, or while the aircraft is unattended) and passengers not correctly seated/secured. Passenger briefings, seating controls, and cabin discipline therefore become primary risk controls (not just customer service tasks).

- Foreign objects left in/on aircraft. Maintenance-related FOD (loose hardware, rags, tools, missing lockwire/split pins) is a recognisable pattern in reporting, pointing to tool control, duplicate inspection, and maintenance release discipline. Operational FOD also features (eg, hoses/lines left attached, intake covers not removed), indicating the need for robust aircraft release process and clear crew/pilot responsibilities.

- Rotor contact events concentrate risk at the tail rotor and in high-exposure operations and aircraft fleets.

The table below identifies common themes from all helicopter occurrence reporting where the description indicated an inadvertent opening or failure of doors, windows or cargo pods. And/or Instances of foreign objects being left in, on, or attached to the aircraft, or debris contacting rotors.

Occurrence categories		
Category	**Count**	**Notes**
Foreign objects left in/on/attached to helicopter	212	Maintenance-related FOD: loose hardware, rags, tools, missing lockwire
Inadvertent door/window/cargo pod opening or failure	161	Doors, windows, cargo pods, cowlings, lockers opening in flight or failing
Debris/foreign objects contacting rotors	34	FOD damage to main rotor, tail rotor, or engine compressor
Total inadvertent opening and FOD occurrences	***407***	***Combined total of all categories***

Type of opening or failure		
Component	**Count**	**Description**
Cabin door	69	Passenger and pilot doors popping open in flight
Engine cowling	29	Cowlings left open or coming open after maintenance/refuel
Cabin door (sliding)	22	Sliding doors coming unlatched
Window	12	Windows blowing out or detaching from frames
Hinge failure	12	Door hinge cracking or failing, door detachment risk
Cargo pod	9	External cargo pods opening or detaching in flight

5. Key insights: Loss of situational awareness or spatial disorientation

- Helicopter Emergency Medical Service (EMS/HEMS) operations feature prominently in the accident/incident data set, often combining night operations, time pressure, and marginal weather. Reported GPS/FMS failures and NVG/NVIS-related issues indicate that navigation and vision-aid reliability, flight control configuration, and operating approvals matter.

- Low-visibility environments remain the primary trigger for situational awareness (SA) loss and disorientation. Occurrences and the fatal examples repeatedly involve reduced external visual cues: low cloud/fog, darkness, and degraded horizon references. Night operations (including HEMS/NVG/NVIS contexts) amplify the risk when terrestrial lighting is limited and weather is variable.

- Inadvertent IMC and rapid-onset spatial disorientation are a high consequence outcome. Occurrence reports include VFR flights that unintentionally enter IMC, followed by disorientation and loss of control developing quickly. The safety outcome is strongly influenced by pilot instrument proficiency, and decision points (eg, timely reversal/escape).

- Workload, distraction, and task fixation are consistent human-performance contributors. Occurrence categorisation highlights distraction/task saturation and explicit SA loss as common patterns. Contributors include multi-tasking, operational communications, passenger/mission demands, and fixation on an external task (eg, terrain, target, or approach).

The table below identifies common themes from all helicopter occurrence reporting where the description indicated that the pilot had lost SA or become spatially disorientated, either because of environmental/weather condition or navigation aid failure.

Occurrence categories		
Category	**Count**	**Notes**
Explicit SA loss	15	Pilot explicitly reported loss of SA during operations
Lost visual reference	7	Pilot lost visual reference with terrain or horizon
Distraction/task saturation	7	Pilot became distracted or task saturated leading to SA loss
Spatial disorientation	4	Pilot experienced vertigo or spatial disorientation symptoms
Whiteout/brownout/flat light	4	Visual illusions from snow, dust, or flat lighting conditions
NVIS/NVG SA issues	4	Issues during night operations or NVG/NVIS use
Inadvertent IMC	2	VFR flight inadvertently entered instrument meteorological conditions
Weather-induced SA loss	2	Deteriorating weather caused loss of situational awareness
Navigation system failure	1	GPS/FMS failure affecting situational awareness
Total occurrences associated with loss of SA or disorientation	***46***	***Combined total of all categories***