July / August 2006

VECTOR

POINTING TO SAFER AVIATION

Reporting Medical Conditions

It's Baffling

RNZAC Part 149 Certification

In, Out and Around Taupo

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

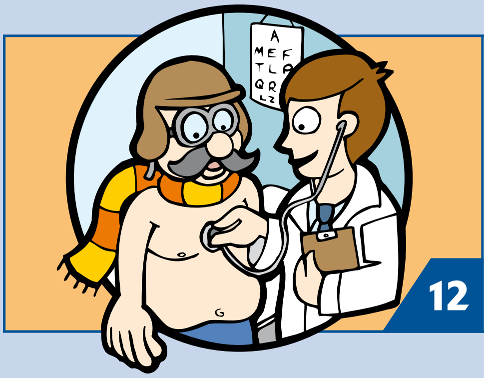
VECTOR

In, Out and Around Taupo

Taupo – a great place to live, work or visit. The aerodrome and local area present some unique challenges to visiting pilots, and these are discussed in this article. The keyword is preparation.

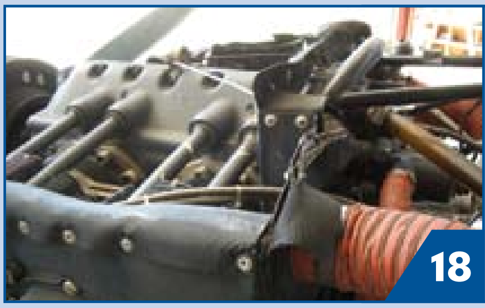
RNZAC Part 149 Certification

The Royal New Zealand Aero Club is now a Part 149 certificated Aviation Recreation Organisation. Their member clubs are now able to operate and train pilots in Class II microlights and the RNZAC can issue Microlight Pilot Certificates.



Reporting Medical Conditions

The medical certification system in New Zealand depends on honest disclosure of any medical matters that could interfere with aviation safety. We explain your reporting obligations, and a pilot who made the mistake of not reporting shares his story.



It's Baffling

The condition and placement of engine baffles are sometimes overlooked, but are critical for proper cooling.

In this issue...

COVER: Taupo Aerodrome – it looks quiet in this picture, but beware, looks can be deceptive!

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In, Out and Around Taupo

This article is aimed mainly at the VFR pilot who has not previously flown in the Taupo area, or who visits Taupo only occasionally. As we have suggested in past articles, and GAP booklets in the "In, Out and Around" series, diligent pre-planning will avoid a great deal of difficulty when flying to a new or infrequently visited destination. Taupo, while being a great place to visit (or live), presents some unique challenges to the itinerant pilot. These include:

- A high level and wide range of aircraft activity, including helicopters, gliders, and VFR and IFR aeroplanes;
- In suitable weather, virtually continuous parachuting during daylight hours, with a Parachute Landing Area (PLA) on the aerodrome;
- A 2-stage Mandatory Broadcast Zone (MBZ);
- Two nearby Low Flying Zones, a Special Procedures Area (SPA) adjoining the MBZ, a danger area within the SPA; and
- Several other aircraft operating sites in the vicinity (water aerodrome, helipads, glider airstrip).

All of this information is available in *AIP New Zealand* and the relevant Visual Navigation Charts (VNC). The 1:250 000 VNCs 13 and 14 depict the MBZ, SPA, danger area, and the various visual reporting points. Note especially the boxed caption on the *AIP New Zealand* aerodrome chart for Taupo: "**Taupo aerodrome is NZ's busiest parachute drop zone – be alert**". Please take the time to study all references well in advance of your intended trip, and, if there is still something you are not sure of, contact Taupo UNICOM*, or one or more of the local operators for advice.

Getting There

Arriving at Taupo is generally a straightforward exercise in good weather, especially if arriving from the west or south, when the lake will provide good reference. One important thing to remember is that the lake is 1172 feet above sea level, so make due allowance when selecting your flight altitude(s). If you find yourself inadvertently flying in marginal weather along the lake shoreline, be aware that the elevation of Taupo Aerodrome is 1335 feet, that is, another 163 feet above lake level.

Approach Taupo from just about any direction, and dominating the skyline you will see Mt Tauhara (3569 ft), some 4 NM to the northeast of the aerodrome.

Note that the lack of good visual features to the east of Taupo can make accurate position reporting difficult, and, with the slope of the terrain over the last 10 to 15 miles, you can find yourself unexpectedly close to Taupo without having made any preliminary radio calls. This can be a problem with arrivals from the east, as the MBZ boundary is just one mile east of the aerodrome. Additionally, parachute drop aircraft normally descend to the east of the circuit area.

Continued over ...

Mt Tauhara is visible from a considerable distance in good weather. This is a view from Mangakino, with Whakamaru Dam visible to the right of centre, and Mt Tauhara on the skyline.

*For a refresher, see *Vector* article May/June 2005, "MBZs, SPAs, and UNICOM".

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Another view from the Napier–Taupo Road, about 12 NM southeast of Taupo.

Airspace

A two-stage MBZ (B473) is established in the Taupo area – the lower portion extends from the surface to 6500 feet amsl and is partially surrounded by a wider segment from 3000 to 6500 feet amsl. They share a common eastern boundary, part of which is an easily discerned powerline running to the south from Wairakei. The MBZ boundary diverges from the powerline where it makes a turn just east of Taupo Aerodrome. Refer to *AIP New Zealand* page NZAP AD 2 – 31.1 for operating procedures within the Taupo MBZ, but note that joining and transiting traffic is expected to broadcast position relative to a published reporting point. The maximum interval between reports is 10 minutes (shown in each MBZ information box on the VNCs). Ensure that you have identified all the local visual reporting points during your pre-trip planning.

Note: The MBZ is transponder-mandatory above 3000 feet, but we strongly recommend that you have your transponder on Mode C (altitude reporting) at all times in flight within the MBZ. A number of aircraft operating in and out of Taupo are ACAS-equipped, and transponder operation will assist these aircraft with traffic information.

Itinerant IFR pilots should carry, in addition to their normal IFR charts, at least one of the VNCs depicting the visual reporting points in the Taupo area, otherwise the position reports of other traffic may be meaningless or confusing. Your own reports (once you are visual) should relate to these reporting points as per the MBZ operating procedure. A pearl of wisdom for IFR pilots – note the direction of the final approach for the Taupo NDB Alfa approach, and that the missed approach point is the NDB. Think about the implications if the NDB goes off the air while you are on final. (How would you detect the NDB failure, and if you didn't, where would you end up? What back-up navaids do you have?)

To the northeast of the lower portion of the MBZ lies Centennial Park SPA – Centennial Park is an easily identifiable racecourse, with an airstrip along its northern edge. This airstrip is the home base for Taupo Gliding Club, and considerable gliding activity can be expected in the vicinity. In good soaring weather, this activity will not necessarily be confined to the SPA – gliders can be operating anywhere in the local area, and may (with clearance) operate up to 9500 feet. Centennial Park is a private airfield, but it is available for use with the prior permission of the Gliding Club. Model aircraft flying also takes place at Centennial Park – this is the basis for the danger area (D426) depicted on the VNC.

The two main boundaries of the SPA comprise two powerlines, one of which also forms part of the eastern boundary of the MBZ; the second, also originating from Wairakei, curves southward to pass to the east of Mt Tauhara. From where this line crosses the saddle on the eastern side of Mt Tauhara, take a straight line to the summit, then another to the point where the MBZ boundary line crosses the Napier road.

Above the MBZ is controlled airspace: Auckland CTA/D, 6500 to 9500 feet, and Auckland CTA/C, 9500 feet to FL 600. Traffic departing Taupo to the northeast should also be aware of the Rotorua CTA/D step, lower limit 4500 feet, only 14 NM from Taupo. As with all controlled airspace, clearance is required prior to entry.

On the aerodrome chart are depicted Eastern and Western helicopter arrival

Wairakei reporting point (powerhouse) in foreground, with powerline forming the common boundary between the MBZ and the Centennial Park SPA.

and departure areas, as well as a parachute drop area. Helicopters arriving and departing via the helicopter areas will not be above 600 feet agl in the circuit area, and may be seen lower in the Low Flying Zone (L460) immediately east of the aerodrome.

Approaching Taupo

En route, listen to the Taupo AWIB (aerodrome and weather information broadcast, 125.2 MHz) as early as reception will permit. AWIB will also advise whether parachuting is in progress. Before arriving at the MBZ boundary, it is a good practice to listen out on the MBZ frequency (118.4 MHz) to gauge the traffic intensity and to gain an appreciation of where the traffic might be. At or just outside the MBZ boundary, make your initial call, stating position, altitude and intentions, with an (as accurate as possible) ETA. When arriving from the south, for example, a typical call might be, "Taupo traffic, X-ray Yankee Zulu Mission Bay three thousand five hundred, Taupo at five two". Approaching from the east, an earlier call is desirable, given the proximity of the eastern boundary of the MBZ to the aerodrome.

A reminder: UNICOM is not AFIS (aerodrome flight information service) and does not provide traffic information, nor a SAR alerting service, nor a flight plan termination facility. A UNICOM may relay reports on aircraft movements.

With the intensive parachuting activity at Taupo, an overhead join is not recommended. If Runway 35 were in use in our example, joining long final would be a sensible option, transmitting your intentions prior to joining and once established. If Runway 17 is in use, join downwind right-hand. If the crosswind on 17/35 is a problem, 11/29 is available, but exercise extreme caution if parachuting is in progress.

A good lookout must be maintained at all times in the Taupo area. Ensure that your landing lights are on at all times while in the MBZ – they make you far more conspicuous to other traffic. Even though CAR 91.135 *Mandatory broadcast zones* requires pilots to "activate, if equipped, the aircraft's landing lights **or** anti-collision lights", normal practice is to have the anti-collision light(s) on continuously while airborne anyway, **and** the landing lights on in addition.

Parachuting

On a normal operating day, there can be up to four parachute drop aircraft airborne at any one time, and this equates to a total of about 30 parachutes. Most of this activity is tandem jumping, so the parachutes are under the control of professional jumpmasters.

Normal drop altitude is 13,000 feet (amsl), and a drop run can take up to three minutes to complete. Drop aircraft will broadcast on the MBZ frequency before any parachutists leave the aircraft. For the parachutists, there is approximately 45 seconds of free fall, with canopies starting to open at about 5000 feet and fully open by about 4000 feet. This gives around five minutes of flight under the canopy.

Once the parachutists are clear, the drop aircraft will descend rapidly (typically 3000 ft/min) on the eastern side of the aerodrome, joining the circuit from there. Steep approaches are not uncommon, so your lookout needs to take account of this. The drop aircraft may actually land before the parachutists.

Parachutists are dropped upwind of the aerodrome, so be aware of not only the surface wind, but also the upper winds. The usual target area for parachute landing is the grass runway (11/29), which is normally used only for this purpose (except when crosswind on 17/35 is excessive). In an easterly wind, parachutists will aim to cross Runway 17/35 at a minimum height of 1500 feet agl, and if they cannot comply with this, they will land to the east of the aerodrome.

A free-falling parachutist can be extremely difficult to see, so diligent monitoring of the MBZ frequency is essential in order to become 'situationally aware' – otherwise you can be flying along quite happily with no traffic in sight, and suddenly half a dozen parachute canopies in assorted colours materialise in front of you. Disconcerting if you are not expecting it!

Because of the parachuting activity, transiting aircraft should remain well clear of the aerodrome area (we recommend a 3-mile margin). Passing the aerodrome on the downwind side should ensure avoidance of any parachuting activity. If required, controlled VFR is available above 6500 feet in the CTA/D.

Additionally, aircraft departing from Runway 17 should maintain runway heading at least to the southern boundary, as an early right turn would infringe the parachute landing area. Similarly, an aircraft carrying out an overshoot should not climb above 1000 feet agl before the southern boundary, as in easterly wind conditions, parachutists could be crossing the runway at 1500 feet agl.

Off-Aerodrome Operating Sites

In addition to Centennial Park and its associated operations, there are some other sites you should be aware of.

Huka Falls helipad is located between the Waikato River and Highway 1, some 600 m north of the Falls themselves. A non-flying Mi-8 helicopter near the helipad is a good identifier. Not only will there be traffic operating from the helipad, but also Taupo-based sightseeing aircraft will often be flying over the area (also the Craters of the Moon thermal area, 1 NM west of the Falls), generally below 2500 feet. Located some 500 m south of the Falls is the renowned Huka Lodge, where occasional helicopter passenger drop-offs and pickups occur.

Closer to the aerodrome, Taupo Hospital helipad is located 2.5 NM north of the aerodrome reference point, on the extended centreline of Runway 17/35.

Continued over ...

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This is used infrequently, and only for ambulance or medevac flights.

Floatplane activity can be expected from time to time on the lake, from Taupo Water aerodrome, about 1 NM to the west. During summer, boat-towed parasailing can take place in the same area. Additionally, helicopter flights to and from a pontoon near the boat harbour (where the Waikato River flows from the lake) may be expected in suitable weather.

Arriving from and departing via the southern end of Lake Taupo will take you over or close to Turangi Aerodrome. Normal unattended aerodrome considerations and procedures apply.

Weather

Taupo Aerodrome experiences considerable orographic sheltering because of the extensive high country surrounding the lake. Good flying conditions can be experienced in the local area, while surrounding areas are affected by low cloud. In most directions, the surrounding terrain is higher than Taupo, and sufficient clearance between cloud and ground can become a problem. This can be a subtle trap for arriving traffic, as the aerodrome forecast (TAF), routine reports (METAR), and the AWIB can indicate that the weather at Taupo is suitable, but this is not necessarily the case en route.

For departures, the rising terrain in most directions can cause similar problems. Following the Waikato River downstream is a possible option, except in moist northerly conditions, when the valley may fill with low stratus and associated drizzle. If in any doubt as to the suitability of the weather for departure, seek the advice of the local operators. Alternatively, stay another day, or however long it takes!

Wind directions at the aerodrome are westerly 23 percent of the time and southwesterly 16 percent. Calm conditions are experienced for about 19 percent of the time. Turbulence is generally associated with flows between east and southwest, because of the nearby mountain ranges.

In a westerly, wind funnelling up the gully just to the north of the runway (shown on the aerodrome chart) can give a sudden unexpected updraught on short final for 17 (as if you didn't have enough on your hands with the crosswind).

A gap in the weather – tempted to have a go?

Not likely – the cloudbase is at ground level on the other side of the aerodrome.

Fog is experienced on about 18 days per year, and in clear anticyclonic conditions in winter, severe frosts can occur. Check the GAP booklet *Winter Flying* to refresh your knowledge of precautions regarding frost deposits on aircraft left in the open.

A tip: all those fumaroles, thermal power stations and other steam-emitting industries provide continuous wind information. In the event of an engine failure, this awareness could save you valuable seconds.

Seeing Taupo from the Air

Commercial sightseeing activity can be very intense, and local operators generally have set routes and heights. Should you wish to do some local private sightseeing, it would be beneficial to visit one or more of the local operators, explain your intentions, and ask how you can fit it with the general traffic flow. Such an approach is usually appreciated, and the operators will do their best to help you. They may even advise you on the best scenic attractions to visit.

It's Worth the Effort

As stated at the beginning, good planning is paramount. Diligence in your pre-trip preparation will enable you to operate confidently in the Taupo area. If there is some aspect on which you are still unsure, contact Taupo UNICOM by telephone on 0–7–378 1784 or by email: unicom@taupoairport.co.nz. Local operators can also offer advice.

A properly prepared pilot should enjoy a scenic and educational visit. ■

RNZAC Part 149 Certification

At the Royal New Zealand Aero Club's annual conference on 24 June 2006, the Director of Civil Aviation, John Jones, presented RNZAC President, John Spry, with the Club's Part 149 Certificate, officially making RNZAC an Aviation Recreation Organisation. This allows the RNZAC to issue Microlight Pilot Certificates by prescribing an examination syllabus, conducting examinations, prescribing flight test standards, and conducting flight tests. RNZAC member clubs can now operate and train pilots in Class II microlight aircraft types under Part 103.

The RNZAC has determined that all microlight flight training carried out by their member clubs will be in accordance with the requirements of Part 61, and all dual instruction will be carried out by A, B, or C category instructors. The RNZAC will not be setting their own examination syllabus or conducting exams. All their Pilot Certificate candidates will be required to obtain passes in the Part 61.153(6) PPL examinations administered by Aviation Services Limited.

"As our member clubs are, in the main, training to Part 61 standards already, it seems logical to continue that level of flight training in microlights, especially as most club microlights are in the higher performance category these days, exceeding 80 knots cruise at 75% power," RNZAC Executive Secretary Dave Bishop said.

This increases the number of Aviation Recreation Organisations capable of issuing Microlight Pilot Certificates to three, with RNZAC joining the Recreational Aircraft Association of New Zealand (RAANZ), and Sport Aviation Corporation (SAC).

John Jones (left) presents John Spry with RNZAC's Part 149 Certificate.

Young Eagles News

The RNZAC's Young Eagles Programme aims to introduce young people to flying as a sport and recreational pursuit, increase the level of participation by young people, share the fun, excitement, and experience of flying with the next generation, and through that build future membership for participating aero clubs.

Young Eagles Coordinator, Robert Orr, announced some exciting changes to the programme at the RNZAC annual conference in June 2006.

- In 2007 there will be five Young Eagles Scholarships, down from six, but the value of each has been increased from $1500 to $2000.
- Clubs can nominate deserving Young Eagles for a subsidised trial flight. To be eligible, a Young Eagle must be registered with RNZAC, must have completed two flights with a Flight Leader, and be at least 15 years old. RNZAC will pay 25 percent of the trial flight cost up to a maximum of $40, and the Young Eagle's host aero club will also pay 25 percent of the cost.

Rewards are being introduced for Flight Leaders who regularly support the programme. The 10 Flight Leaders who have conducted the greatest number of Young Eagles flights each year, and whose BFR falls due within twelve months of 31 March of that year, will receive $150 each towards the cost of their next BFR. Flight Leaders will also receive shirts and badges to recognise their special status.

Non-Precision Instrument Approaches

Flying a GNSS approach with vertical path guidance.

You may have noticed a few changes to the names and layout of non-precision instrument approaches in the *AIP New Zealand* Volumes 2 and 3.

GPS approaches are now called RNAV(GNSS). This is because GPS is the name of the United States Global Positioning System. GPS is only one of the systems that makes up the Global Navigation Satellite System (GNSS). The Russian segment of GNSS is known as GLONASS and the European segment, which is not yet operational, is called Galileo. RNAV stands for area navigation.

The terms LNAV and VNAV have also been introduced for RNAV approach minima. LNAV is lateral navigation and VNAV is vertical navigation. Approach procedures that have been evaluated using PANS-OPS Baro-VNAV criteria will have LNAV/VNAV minima published, giving the DA, DH and visibility required for the approach when flown with vertical path guidance. Higher LNAV minima are also published, giving the MDA, MDH and visibility for aircraft flying the approach without vertical path guidance. See Figure GEN 2.3-10.

LNAV/VNAV minima can be used only if your aircraft is equipped with an approved navigation system that gives the pilot computed vertical guidance of the aircraft's position in relation to the promulgated vertical path angle (VPA).

LNAV/VNAV minima will always be accompanied by a minimum aerodrome temperature. If the aerodrome temperature drops below the published minimum, then the LNAV/VNAV minima cannot be used. LNAV minima must be used instead. Lower than standard temperatures will cause an aircraft's true altitude to be lower than the barometric indicated altitude. This lower true altitude at lower temperatures reduces the safety altitude buffer between the aircraft and the obstacles below the flight path. The minimum temperature catered for in the design of the approach and its associated minima is always specified.

Figure GEN 2.3-10
RNAV Approach

MDA/MDH without vertical path guidance

DA/DH with vertical path guidance

CATEGORY	CAT A	CAT B	CAT C	CAT D
LNAV/VNAV*	**360** (330) - 1200			
LNAV	**440** (410) - 1500			
Circling	**600** (550) - 1900	**700** (650) - 2800	**800** (750) - 3700	**900** (850) - 4600
*Valid to AD temperature -5°C				

Minimum temperature to which use of the LNAV/VNAV minima is authorised

Figure GEN 2.3-11
RNAV Approach for RNP Certified Aircraft Only

CATEGORY	CAT A	CAT B	CAT C	CAT D
LNAV/VNAV* RNP0.3	**360** (330) - 1200			
LNAV RNP0.3	**440** (410) - 1500			
Circling	**600** (550) - 1900	**700** (650) - 2800	**800** (750) - 3700	**900** (850) - 4600
*Valid to AD temperature -5°C				

RNP for the approach

The example given in Figure GEN 2.3-11 is a minimum aerodrome temperature of –5ºC.

The minima tables for RNAV approaches specifically for RNP certified aircraft now show the level of required navigation performance required for the minima. See Figure GEN 2.3-11.

The approach profile diagrams for non-precision approaches with constant-angle descents have also changed. Shading has been introduced to show minimum obstacle clearance altitudes for segments of the approach.

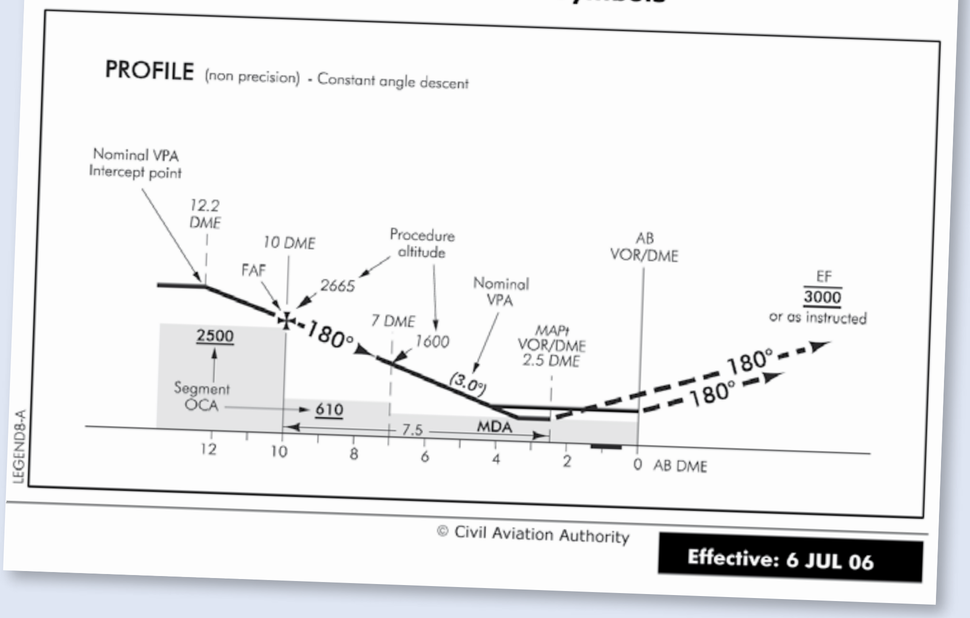
Advisory altitudes are still given in the minima table, but some procedure altitudes are now shown on the profile diagram as well. The nominal vertical path angle (VPA) has also been added to the profile diagram. It is shown in degrees and placed in brackets just above the approach track. See Figure GEN 2.3-8.

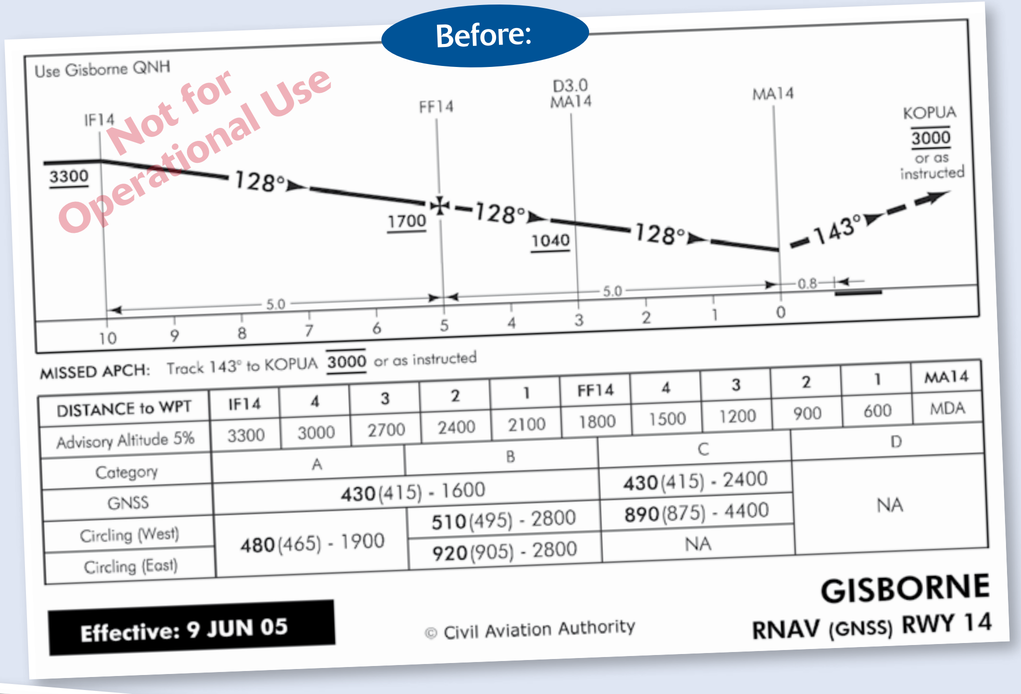
Here is a before and after comparison, using the Gisborne RNAV (GNSS) RWY 14 approach plate. The plan diagram on the approach plate remains the same, but the profile diagram and minima table will look different to the IFR pilot. The new features on the plate effective 8 Jun 06 have been circled.

Note that the procedure altitudes are higher than the obstacle clearance altitudes at each step. Procedure altitudes will never be lower than segment OCAs.

A working group has been established to look at further improvements to IFR approach plates. Any general feedback or ideas would be appreciated. You can email your comments to Alan Roberts, Aeronautical Services Officer, robertsa@caa.govt.nz. ■

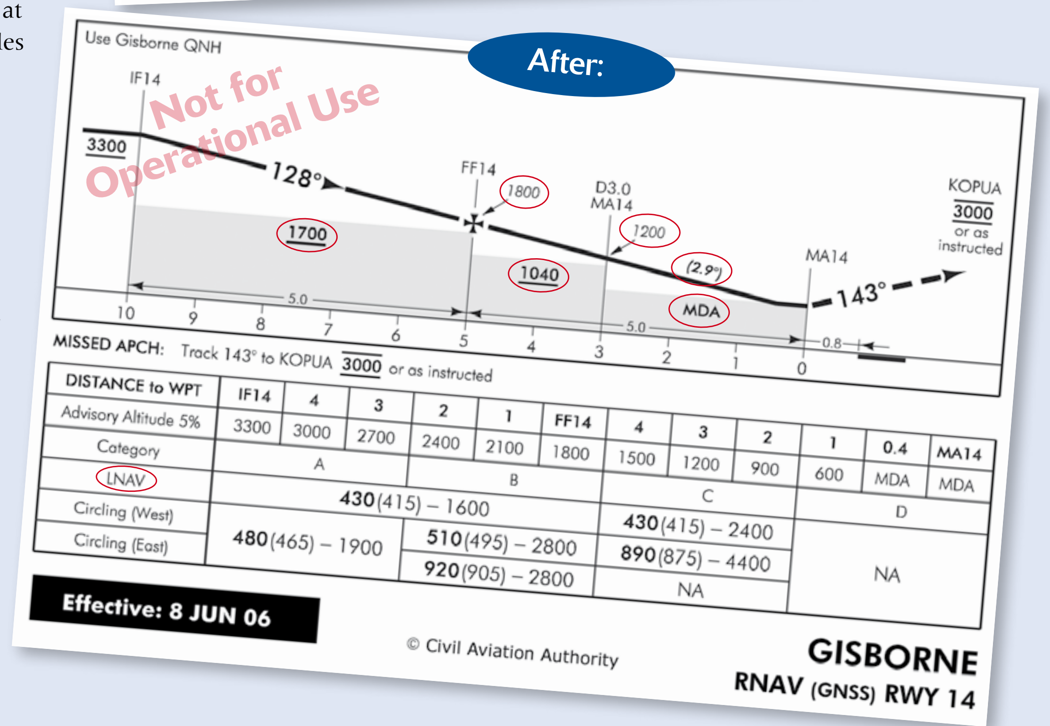
Figure GEN 2.3-8
Instrument Chart Symbols





DISTANCE to WPT	IF14	4	3	2	1	FF14	4	3	2	1	MA14
Advisory Altitude 5%	3300	3000	2700	2400	2100	1800	1500	1200	900	600	MDA

Category	A	B	C	D
GNSS	430(415) - 1600		430(415) - 2400	NA
Circling (West)	480(465) - 1900	510(495) - 2800	890(875) - 4400	
Circling (East)		920(905) - 2800	NA	



DISTANCE to WPT	IF14	4	3	2	1	FF14	4	3	2	1	0.4	MA14
Advisory Altitude 5%	3300	3000	2700	2400	2100	1800	1500	1200	900	600	MDA	MDA

Category	A	B	C	D
LNAV	430(415) – 1600		430(415) – 2400	NA
Circling (West)	480(465) – 1900	510(495) – 2800	890(875) – 4400	
Circling (East)		920(905) – 2800	NA	

Crew Nearly Extinguished

Shortly after takeoff on a freight flight, the Metroliner crew noticed a pungent smell in the cockpit and put on their oxygen masks as a precaution. It was discovered that a hand-held fire extinguisher in the cockpit area was discharging. The crew were being affected by the fumes, and they decided to divert to the nearest aerodrome, from where they were both taken to hospital feeling "very sick".

The extinguisher was found to have no safety pin fitted and at some stage had been knocked sideways in its supporting bracket, partially depressing the trigger. Had the safety pin been in place, this event would not have occurred. This highlights the importance of including fire extinguishers in pre-flight checks, not only to ensure that safety devices are in position, but also that the extinguisher is fully charged and within its test date.

Example of a properly secured fire extinguisher.

The Do's and Don'ts of TCAS II Operations

A previous article "More on TCAS II" (March/April 2005 issue of *Vector*) looked at how an Airborne Collision Avoidance System (ACAS) worked. TCAS or Traffic Alert and Collision Avoidance System is the US-developed equipment that provides the functions of an Airborne Collision Avoidance System (ACAS). It is simply a system that provides an automatic warning to pilots when the system detects other aircraft in potentially hazardous proximity.

Operationally, the flight safety benefits of TCAS II are well proven. If pilots follow the correct actions in response to a resolution advisory (RA), TCAS II can act as an efficient safety net for preventing mid-air collisions between aircraft, especially during situations of one aircraft climbing and another aircraft descending to the same flight level. If, however, these warnings are not complied with, or misinterpreted, the benefit of an airborne collision avoidance system can be seriously eroded.

Level-off with 1000 Feet Separation – What's New?

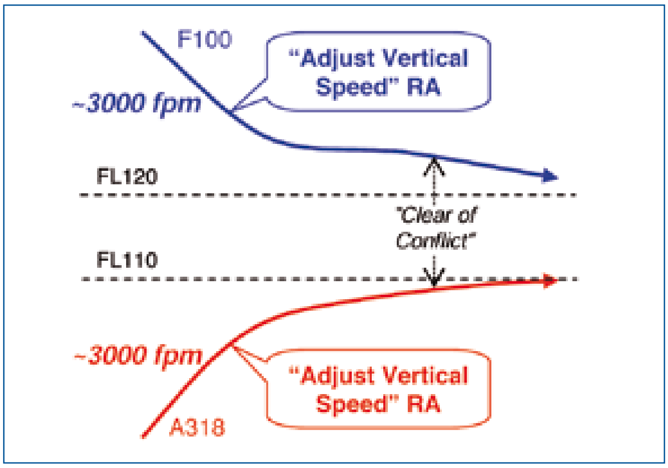
TCAS II (version seven) has contributed to a significant reduction in the number of RAs generated when aircraft are expected to level off to achieve 1000 feet separation. These situations, however, still cause a large majority of RAs. Figures from a major European airline show that they represent 70 percent of RAs generated on its A320 fleet.

Consequently, several airlines have modified their procedures, requiring pilots to reduce vertical speed to less than 1500 feet per minute over the last 1000 feet of a climb or descent.

Data collected by a major European airline show that the likelihood of receiving an RA while levelling off is three times lower when this reduction is implemented.

Example

In this European example, an A318 is climbing to FL110 at about 3000 feet per minute. A Fokker 100 is descending to FL120, also at about 3000 feet per minute. The aircraft trajectories are converging both horizontally and vertically. Due to the high vertical closure rate (6000 feet per minute), the A318 and the F100 receive an "Adjust Vertical Speed" RA at respectively 900 and 1000 feet from their cleared flight level. Both advisories request action to reduce the vertical speed to 1000 feet per minute. The A318's rate of climb is reduced to less than 1000 feet per minute. The F100's descent is reduced to about 1000 feet per minute. The correct reactions to the advisories by both pilots minimised the consequences.



Incorrect Actions

It is important that pilots follow the RAs correctly and respond immediately, unless doing so would knowingly jeopardise the safety of the aircraft. The following incidents highlight the dangers of not complying correctly with the RA.

Opposite Manoeuvre to the RA to Follow an ATC Instruction

A B767 is maintaining FL290 heading west. An A319, heading southeast, is at FL270 on a converging track. The aircraft are controlled by two different ATC units (the vertical boundary is FL285).

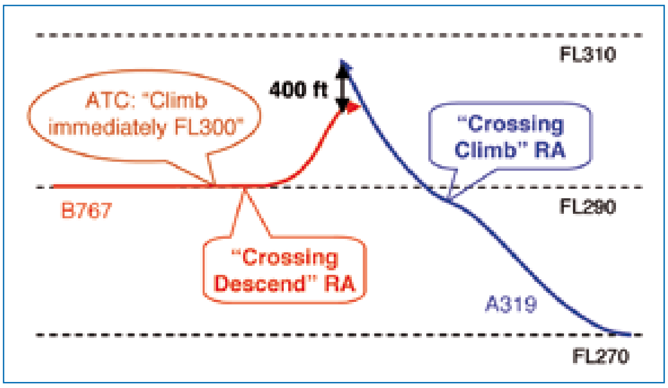
The A319's pilot requests a higher cruising level. Due to a coordination error between the two ATC units, the A319 is cleared to climb to FL290, the same flight level as the B767.

Following Short Term Conflict Alerts triggered in both ATC units, the B767 is instructed to climb immediately to FL300 and the A319 to "expedite descend FL270".

However, almost at the same time, each aircraft receives a coordinated RA opposite to the ATC instruction. The B767 receives a "Crossing Descend" RA. **The pilot disregards the RA and follows the ATC instruction to climb.** The A319 receives a "Crossing Climb" RA. The pilot correctly reacts to the RA by increasing the rate of climb.

Because of the B767 pilot's opposite manoeuvre to the RA, the very small vertical separation between the aircraft does not increase. Consequently, the A319 receives an "Increase Climb" RA and the pilot increases the rate of climb to 5000 feet per minute. The B767's pilot eventually recognises the "Descend" RA and stops the climb just before the "Clear of Conflict".

Despite the large vertical deviation of the A319 (3000 feet), the aircraft passed at 400 feet and 0.3 NM.



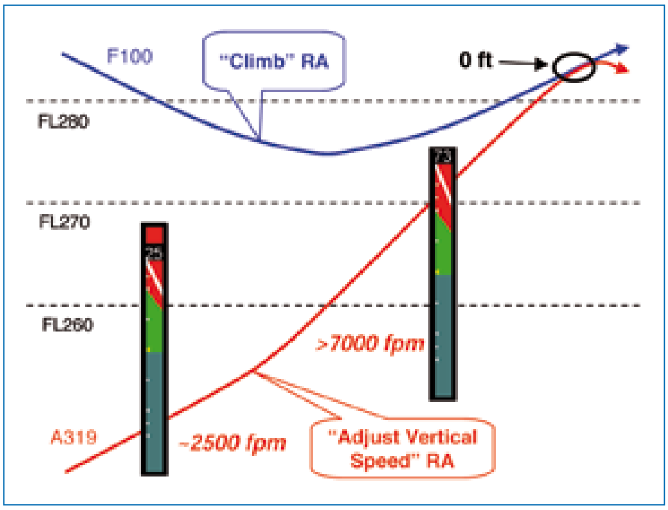
Wrong Reaction to "Adjust Vertical Speed" RA

An A319 is climbing to FL260 at about 2500 feet per minute. When passing through FL251, it receives an "Adjust Vertical Speed" RA requiring a reduced rate of climb to 1000 feet per minute. The RA is triggered against a Fokker 100 descending to FL270 at 2000 feet per minute on a converging track.

The A319's flight crew misinterprets the RA and increases the rate of climb to more than 7000 feet per minute instead of reducing it. Due to this opposite reaction to the RA and despite a correct response of the Fokker 100 to the coordinated RAs ("Adjust Vertical Speed" then "Climb"), the A319 receives a strengthened "Descend" RA. However, the flight crew continues to climb very quickly until the "Clear of Conflict".

As a result, the A319 busts its cleared flight level by 2200 feet and the aircraft passed at a distance of 1.6 NM at the same altitude.

The safety issue of opposite reactions to "Adjust Vertical Speed" RAs is being investigated by the Requirements and Technical Concepts for Aviation (RTCA). The RTCA, the TCAS II standardisation body, is looking at the causes for the opposite reactions and work is proceeding on improving the aural message and the display for these specific RAs.



Fundamental Do's and Don'ts

The operational monitoring programmes show that TCAS II is extremely effective in improving safety. To maximise the safety benefits and operational compatibility with ATC it is important for pilots to observe the following fundamental do's and don'ts:

- TCAS II must be operated in RA mode outside aerodrome traffic circuits to provide full safety benefits (use TA mode within the aerodrome traffic circuit).
- Follow all RAs promptly and accurately.
- Never manoeuvre in the opposite sense of an RA.
- Report RAs to air traffic control as soon as possible as the RA manoeuvre may have implications for other traffic.
- Controllers must not interfere with pilots' reactions to RAs.
- Vertical speed must be reduced in response to "Adjust Vertical Speed" RAs.
- TCAS traffic displays must not be used for self-separation (they do not generally have conflicting aircraft identification or vector information to allow this).
- Vertical speed must be reduced when approaching the cleared flight level.

Remember, TCAS relies on aircraft having a working transponder with Mode C (altitude information).

Reference: Eurocontrol. For further information, see the Eurocontrol web site: www.eurocontrol.int/msa. ■

CAA News

The CAA gained attention in the public media during late May and early June. Two reports generated this coverage: the 2005 report of the Controller and Auditor-General on CAA certification and surveillance functions, and the Coroner's report into the deaths of eight people in what has become known as the Air Adventures accident.

Although the two reports are unrelated, and serve different purposes, CAA actions already under way in response to the earlier Controller and Auditor-General's report will address many of the Coroner's recommendations.

The Director of Civil Aviation, John Jones, said, "We are already working on the findings that relate to the CAA. Changes are required to some Civil Aviation Rules to address several of the Coroner's findings. These will take longer because of the technical analysis and consultation required as part of the rule-making process.

"The Coroner heard a great deal of evidence from witnesses who had not expressed their concerns about Air Adventures before the tragedy. We regret that we did not have this information earlier, and we encourage everyone to report any concerns they have about aviation safety to us.

"We regard the Air Adventures accident as an appalling tragedy that signals more action is needed to improve safety standards in some sectors of the industry. The CAA is acting urgently to address what it can – we also need the aviation community to cooperate."

Progress reports will be published on the CAA web site regularly as we address the findings of both the Auditor-General's report, and the Coroner's report. See www.caa.govt.nz, "What's new". You can see the report of the Auditor-General on the web site: www.oag.govt.nz. ■

For all aviation-related safety and security concerns, call this toll-free number:

0508 4 SAFETY (0508 472 338)

(A voicemail service operates outside office hours.)

Reporting Medical Conditions

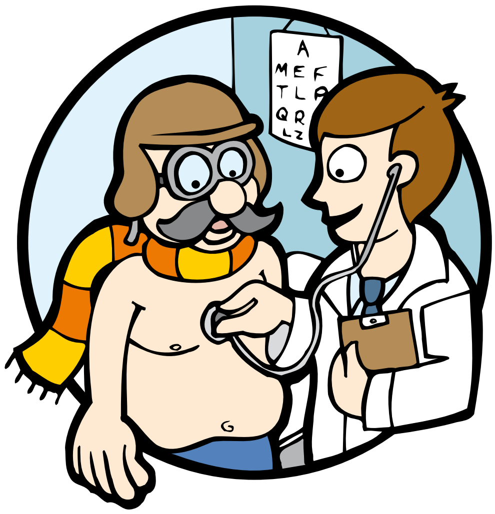
The medical certification system in New Zealand depends on honest disclosure of any medical matters that could interfere with aviation safety.

Section 27C(1) of the Civil Aviation Act requires a licence holder to advise the Director, as soon as practicable, if he or she is "aware of, or has reasonable grounds to suspect, any change in his or her medical condition or the existence of any previously undetected medical condition that may interfere with the safe exercise of the privileges to which his or her medical certificate relates". The Act also stipulates that a licence holder may not exercise the privileges of their licence in this situation.

In practical terms, how does a pilot or air traffic controller know if a particular medical condition must be reported? The key word in the Act is "may". Any medical condition that "may" interfere with the safe exercise of your licence must be reported. So, if you are not absolutely certain either way, you are best advised to report it. You may also wish to contact your Medical Examiner (ME) to discuss the likely impact of your medical condition. If you are reasonably confident that your medical condition cannot interfere with flight safety, then you do not need to report it. Please note, the law requires you to act reasonably.

If you decide to report a medical condition, you can contact the CAA Central Medical Unit directly.

The relationship between CAA and pilots must be a partnership of mutual trust and respect.



There are some temporary medical conditions that do not need to be reported. These will be published in a General Direction (GD) issued by the Director. A draft "Temporary Medical Conditions" GD has been developed and gone through two rounds of public consultation. Work is continuing on this GD.

It is an offence to fail to disclose, without reasonable excuse, a medical condition that may interfere with aviation safety. The maximum penalty is imprisonment for up to 12 months, or a fine of up to $5000. The follow-on effects of being prosecuted should also be considered, for example your future travel options may be restricted if you have a criminal record. A pilot's aircraft insurance and life insurance may also be void if they continue to fly with a known medical condition that has not been reported.

Every medical practitioner, whether they are a CAA Medical Examiner or not, also has an obligation to report any medical conditions that may interfere with aviation safety. This is a public safety provision that overrides your GP's obligations to patient confidentiality. For more information on the responsibilities the Civil Aviation Act places on medical practitioners, see Medical Information Sheet 02 on the CAA web site, www.caa.govt.nz. If your family doctor is making a report to the CAA, this does not remove your obligation to report. The licence holder must also file a report to satisfy their legal obligations.

A Lesson Learned

A PPL holder who made the mistake of not reporting a medical condition shares his story and experiences, in the hope that others can learn from his mistake and be encouraged to report.

In March 2003, this pilot was issued with a class 2 medical certificate. Two weeks later, he suffered serious chest pains and went to see his doctor. An exercise ECG and blood enzyme test failed to identify any abnormalities with the heart, but an angiogram in May 2003 revealed serious artery restrictions that required urgent treatment. A successful artery stenting procedure was conducted the same day.

"I knew that I had to inform CAA but I kept putting it off. The longer I left it, the worse the situation became. I was deeply afraid I would lose my licence altogether. I love flying and would hate to lose my aircraft. Time drifted on. I did very little flying. I only flew for the sake of my Continental O-200 engine, and to stay current. By July, I thought I had left it too late, and by default drifted into an ever deeper and tighter web of my own making."

In May 2004, the pilot applied for a further class 2 medical certificate and failed to disclose any information about his heart condition, treatment, or medication, on the application form. A class 2 certificate was issued following his application.

"I didn't sleep well and would wake up worrying about the future. I flew my plane much less, and I didn't take passengers. I was worried that any change in my cardiovascular status would uncover the previous cardiovascular incident."

In August 2005 the pilot again applied for a class 2 medical certificate.

"By the time of my 2005 medical, I could not live with myself any longer. Although I went through the examination okay, at the end I told the Medical Examiner the whole story."

The matter was investigated by the Law Enforcement Unit, and after careful consideration of all the circumstances, the pilot was issued with a formal warning by the Director, for a breach of section 46C of the Civil Aviation Act 1990.

This private pilot's dishonesty exposed himself, everyone who flew with him, his insurers, and others within the community, to increased risk whenever he flew his aircraft. The fact that no accidents occurred, and no-one was killed, does not indicate that these actions were safe – they were not.

After rigorous checking of this pilot's heart, he was issued another class 2 medical certificate, and he has returned to active flying. The issue of a new medical certificate routinely occurs six months after successful cardiac surgery of the type this pilot underwent.

"How much better it would have been in the last two years, had I had the courage to speak out. We cannot hope to conceal medical problems for long. The relationship between CAA and pilots must be a partnership of mutual trust and respect. If trust is lost, we all suffer for it. I hope my story will be of some assistance to others who are at risk of making my mistake." ■

Air Transport Course

The sixth Air Transport Course run by the Royal Aeronautical Society New Zealand Division, in conjunction with the University of Auckland, will be held in Auckland from 13 to 17 November 2006.

This is a five-day course that has been devised by the London-based Royal Aeronautical Society.

Course members will gain an insight into all aspects of the air transport industry from an international panel, whose members are drawn from industry as well as academia. The course is designed for middle management and senior supervisors, but it will be of great benefit to all people across the aviation and travel spectrum.

Don't miss this opportunity to learn more about the aviation sector. Even if you have attended this course before, it is great to refresh and update your knowledge.

For further information and an enrolment form, check the Royal Aeronautical Society New Zealand Division web site, www.raes.org.nz, but be in quick as numbers are limited. Alternatively you can receive an enrolment form by contacting Allan Boyce, Tel: 0–9–530 8880, Fax: 0–9–530 8880, Email: ajboyce@xtra.co.nz. ■

Attendees in 2004 during the visit to Auckland International Airport.

Lifed Components

Mechanical failures (breakage) could be eliminated by designing aircraft components to be so strong that they simply would not break – ever. Unfortunately, the weight penalty from doing this would defeat the purpose of having an aircraft that could get airborne with any meaningful payload. So certain aircraft components are given a finite life (time in service, calendar, or a combination of both).

Continuing to use components beyond their 'use-by date' might seem an attractive way of saving money, but this practice can be economically disastrous and have fatal consequences.

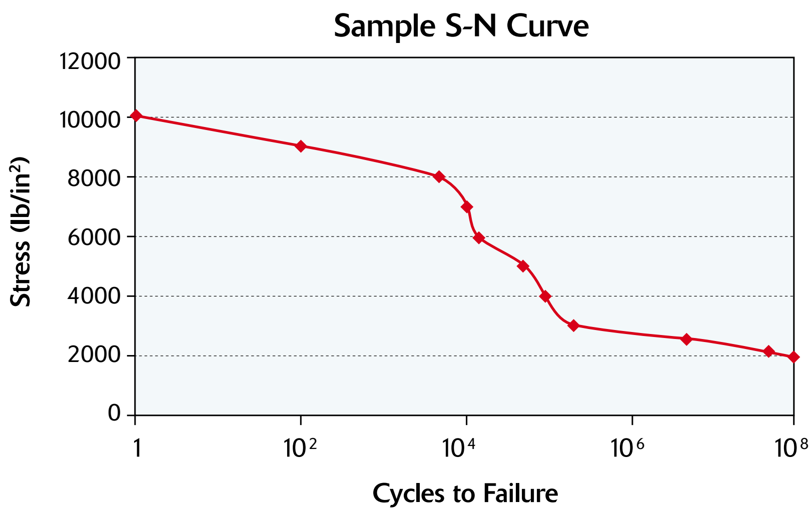
Design for Fatigue

The easiest way to reduce the weight of a component is to make it as thin as possible, while retaining the capability of withstanding the loads applied to it in operation. Another tactic employed by the designer is to make the part from an alloy with a high strength-to-weight ratio. For this reason, aluminium alloys are extensively used for aircraft components.

It is not as simple as calculating the load on the part and using the material's ultimate strength to determine the required thickness. This is because high-strength alloys (aluminium and others) have a tendency to develop fatigue cracking under repeated load fluctuations. Fatigue is an entire topic in itself, but typically the fatigue properties of an alloy part mean that under repeated loading it is capable of withstanding only 50 percent of its normal ultimate strength.

The designer is forced to design a rotary component to operate at a stress level that may severely restrict its service life.

The manufacturer of a new alloy subjects samples of the alloy to extensive testing, and after obtaining a great deal of data, produces an S-N diagram (Stress/Number of cycles). This graph describes how the strength of the alloy varies depending on how many cycles of load are applied. The vertical axis is the stress (load per unit area) applied to the part.



At the lefthand end of the graph we might find that it can withstand 10,000 pounds per square inch (lb/in^2), but only once. It can withstand 9999 lb/in^2 twice, or 9000 lb/in^2 a hundred times. As we move towards the right, the number of cycles to cause failure increases into the thousands and millions, but the allowable stress per cycle drops lower and lower.

The designer must determine the size of a part that gives a stress level corresponding to a number of cycles equivalent to a useful service life. For an item such as the landing gear, which may have only one stress cycle per flight, this is relatively easy, but for a wing spar it is more difficult to predict how many manoeuvres or how much turbulence an aircraft will be subjected to in each flying hour. The designers try to take this into account by assuming a certain mission profile. Clearly, if you regularly fly the aircraft faster, or at heavier weights than the designer predicted, you will be increasing both the amplitude of the stress and the number of cycles, and moving the life back up the curve toward the left. Failure of your aircraft will occur sooner than predicted.

Fatigue of Rotary Components

For the fixed-wing landing gear example, 10,000 cycles may represent a service life of 20 years, but in the case of a helicopter main rotor hub component in which the stress fluctuates several times per revolution, at say 400 revolutions per minute, the fatigue cycles add up very quickly. This would suggest that rotary components should be heavily built for extra strength. Unfortunately, this leads the designer to another problem. Because of the speed of rotation, adding a mass of even a few grams to these components contributes to larger inertial and gyroscopic forces, which in turn may require many extra kilograms in transmission components and associated structures.

Thus the designer is forced to design a rotary component to operate at a stress level that may severely restrict its service life. This is one of the reasons helicopter components tend to have more limited lives than their fixed-wing counterparts. The other reason is redundancy – while you could probably retain some control of an aircraft with one broken aileron horn – one broken pitch link can destroy a helicopter in half a revolution of the rotor, or about 1/13 of a second.

This is a Robinson R22 main rotor blade that failed as a result of metal fatigue. The fatigue striations are clearly evident on the fracture surface. This can occur if the blade is used beyond its design life, or subjected to loads greater than those anticipated by the manufacturer, or a combination of both.

Summary

This is very basically how the finite life of a component is developed.

The designers walk a fine line between performance, safety and longevity when they set the finite life for aircraft components. Adherence to the limits that they set is essential to ensure the continued safe operation of your aircraft. ■

International Success for New Zealand Aviation

John Hickey (left), Director Aircraft Certification Service FAA, and Steve Douglas.

The Civil Aviation Authority of New Zealand (CAA) has been working with the United States Federal Aviation Administration (FAA) over the last two years on a revision of the Implementation Procedures for Airworthiness (IPA) signed in 2003, as part of the Bilateral Aviation Safety Agreement (BASA).

The BASA consists of a high-level executive agreement, and the Implementation Procedures (IP) are technical, procedural documents containing criteria for various types of certification, the processes for determining acceptability, and procedures for obtaining technical assistance.

With the implementation of the IPA, significant new opportunities for industry have arisen. According to Michael Pervan, Air New Zealand's Design Engineering Manager, "the new agreement will save the company a substantial amount of time and money" through eliminating the need to revalidate any repairs and modifications undertaken on Air New Zealand leased aircraft.

Other advantages include local industry being able to manufacture and supply approved parts to foreign markets, and technical staff from both aviation authorities being able to deal directly with each other on airworthiness matters.

Carol Thompson, a director of Auckland-based Flight Interiors believes that, "The signing of the IPA is a significant step forward for the New Zealand aviation sector and is a good example of the CAA working with industry for the benefit of New Zealand."

Steve Douglas, CAA General Manager of Government Relations, says that "The agreement is clear recognition from the largest aviation regulator in the world that the CAA's processes for certification of aircraft, designs, and repairs are of the highest order. Completing the process within two years is recognised as a major success for the CAA and puts the organisation ahead of many other authorities around the world."

The United Kingdom, Germany, and Australia are the only other countries that have achieved this recognition in their bi-lateral agreements with the United States.

If you require further information on the IPA, contact CAA Manager Aircraft Certification, Geoff Connor,
Tel: 0–4–560 9444,
Email: connorg@caa.govt.nz. ■

New Rules

The Omnibus Rule Fix-Up Project on the current rules programme has now been completed, along with rule amendments for Part 125 Single Engine IFR (SEIFR) Health and Usage Monitoring Systems (HUMS).

The Minister for Transport Safety signed rule amendments for the Omnibus Rule Fix-up Project on 16 May 2006, and these amendments came into effect on 22 June 2006. Rule amendments for SEIFR HUMS requirements were originally part of the current HUMS Rule Project but have been fast-tracked (see below). These amendments were signed by the Minister on 29 May 2006 and came into effect on 29 June 2006.

Omnibus Rule Fix-Up Project

The following Civil Aviation Rules have been amended as a result of this rule project:

Part	1	*Definitions and Abbreviations*	Amendment	31
Part	12	*Accidents, Incidents, and Statistics*	Amendment	2
Part	19	*Transition Rules*	Amendment	9
Part	63	*Certification of Products and Parts*	Amendment	2
Part	65	*Air Traffic Service Personnel Licences and Ratings*	Amendment	2
Part	66	*Aircraft Maintenance Personnel Licensing*	Amendment	2
Part	77	*Objects and Activities Affecting Navigable Airspace*	Amendment	2
Part	91	*General Operating and Flight Rules*	Amendment	14
Part	92	*Carriage of Dangerous Goods*	Amendment	2
Part	101	*Gyrogliders and Parasails; and Unmanned Balloons, Kites, Rockets and Model Aircraft – Operating Rules*	Amendment	2
Part	103	*Microlight Aircraft – Certification and Operating Rules*	Amendment	5
Part	104	*Gliders – Operating Rules*	Amendment	4
Part	105	*Parachuting – Operating Rules*	Amendment	3
Part	119	*Air Operator - Certification*	Amendment	6
Part	121	*Air Operations – Large Aeroplanes*	Amendment	13
Part	125	*Air Operations – Medium Aeroplanes*	Amendment	8
Part	129	*Foreign Air Transport Operator – Certification*	Amendment	3
Part	133	*Helicopter External Load Operations*	Amendment	1
Part	135	*Air Operations – Helicopters and Small Operations*	Amendment	13
Part	139	*Aerodromes – Certification, Operation and Use*	Amendment	4
Part	140	*Aviation Security Service Organisations – Certification*	Amendment	2
Part	171	*Aeronautical Telecommunication Services – Operation and Certification*	Amendment	3
Part	172	*Air Traffic Service Organisations – Certification*	Amendment	5
Part	174	*Aviation Meteorological Service Organisations – Certification*	Amendment	2
Part	175	*Aeronautical Information Service Organisations – Certification*	Amendment	3

The purpose of all of these amendments is to address editorial, grammatical and minor technical issues that have been found in these Rules. The amendments include removing outdated references, amending wording errors, and addressing inconsistencies in rule wording.

In Parts 121, 125, and 135, amendments are made in regard to flight data recorder parameters to align with the United States Federal Aviation Regulations.

Part 125 SEIFR Health and Usage Monitoring Systems (HUMS)

Part 125 – *Air Operations – Medium Aeroplanes*, has been amended as a result of this rule project.

The technical requirements for HUMS in SEIFR passenger operations required urgent update because four of the existing requirements in Part 125 Appendix B8 were found to be technically unable to be complied with. Since the outcomes of the wider HUMS Rule Project are still several months away, this project updated the technical requirements that were causing difficulty in the certification of SEIFR passenger operations.

Further details on the Omnibus and SEIFR HUMS amendments can be found on the CAA web site, www.caa.govt.nz, under "Rules & more – Rules Index".

Pending Rules

Two more rule projects are close to completion. Rule amendments for Part 43 *General Maintenance Rules*, and to include runway end safety area requirements in Part 139 are currently with the Ministry of Transport. ■

Honour for Trevor Joy

Former Manager of Security for the CAA, Trevor Joy, was awarded membership of the New Zealand Order of Merit (MNZM) in the 2006 Queen's Birthday Honours, for services to aviation.

Trevor retired from the CAA in 2004 after 29 years of service. During that time, Trevor developed aviation security into a system that is today recognised worldwide.

"When I first started assessing aviation security in New Zealand, in 1975, we had an open and friendly approach. At one international airport, I counted 17 open gates," Trevor said.

Originally seconded short-term from the New Zealand Police, the former Detective Senior Sergeant started with a blank slate.

The benefits of a centralised, Government-run aviation security system are now well accepted.

Photo: The Marlborough Express

"I studied what was happening in Australia and the United States and soon realised we could do better by installing a national security system, rather than by adopting the regionally controlled models in operation elsewhere."

That decision has proven the right one time and time again.

"It meant we could spread the cost out evenly across the country, and we have had a mobile team of staff and resources. Over the years there have been multiple occasions when we have needed to bolster security temporarily at our international airports. We've been able to deploy extra Aviation Security Service (AvSec) staff from around the country immediately, rather than being limited to staff employed by a particular airport," Trevor said.

The benefits of a centralised, Government-run aviation security system are now well accepted.

"Straight after September 11, both the US and Canada realised how weak their privatised systems were and made the change," he said.

The September 11 attacks on the World Trade Centre were just one of the many security crises that Trevor steered New Zealand aviation through over the years, including the coups in Fiji during the 1980s, and the Lockerbie disaster in 1989.

"On the morning of September 11, I was on holiday in Geraldine. I took the call and the Police Intelligence Officer said 'Hi Trevor, have you got TV? I'm not even going to tell you what's happened, just look at the TV'. That same day I was at a meeting in the Prime Minister's Office, deciding on our response," Trevor said.

"We did very briefly stop all flights into the United States, but within a few days, they were all up and running again. We could soon see that the implications for New Zealand were not horrendous, however flights to the United States were required to have additional security measures applied."

Trevor says New Zealand's aviation security system is now very comprehensive.

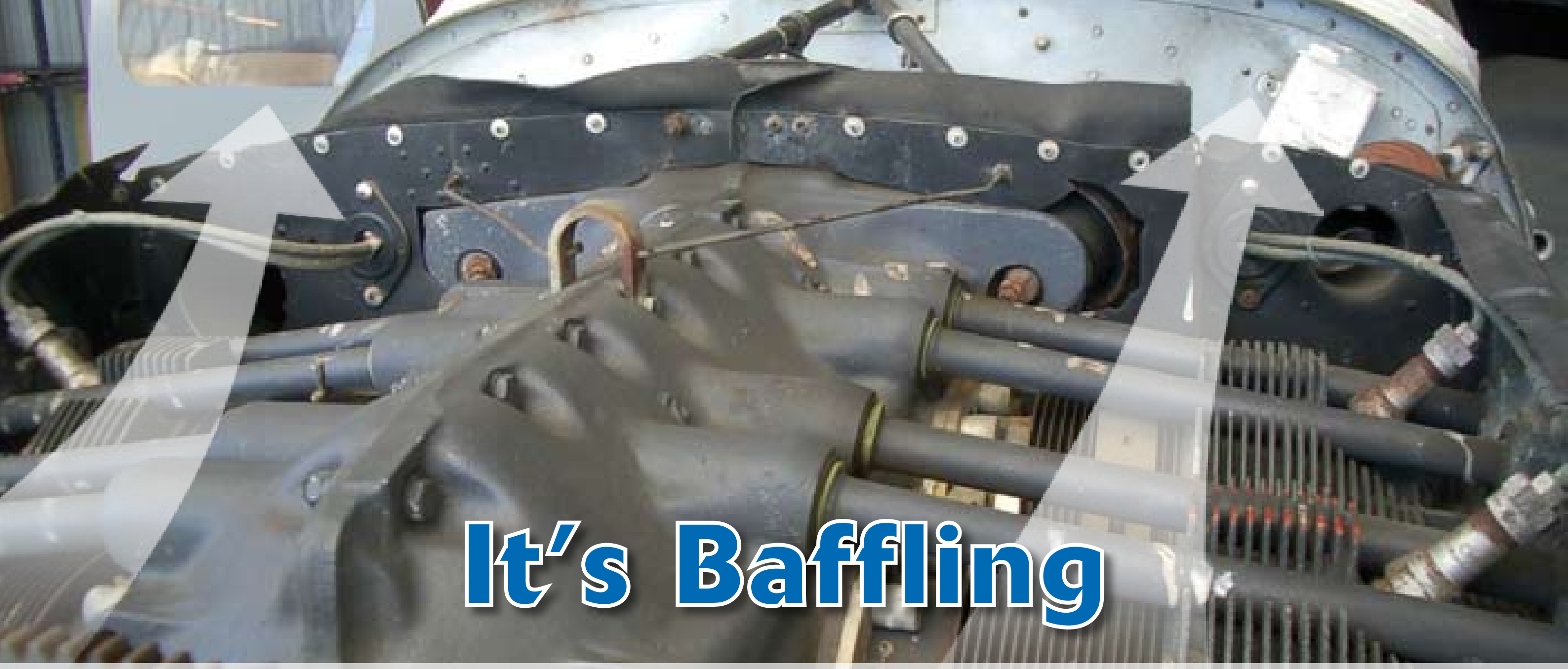
"It seems to be working remarkably well. Security runs deeply through aviation in this country. It is not just a matter of blue uniforms at airports, but cuts across standards for police, border agencies, airlines, airports and the public.

"It is this national, cohesive and integrated system that works so well," Trevor said.

He is now based in Blenheim as an aviation consultant.

In 1989 the operational functions for aviation security were split from the regulatory role. While the CAA continues the regulatory role, the Aviation Security Service (AvSec) is the service provider. ■

In the 2006 Queen's Birthday Honours, former Secretary for Transport, Dr Robin Dunlop was awarded the Queen's Service Order.



It's Baffling

It's baffling why any aircraft owner or engineer would allow the engine baffles on an aircraft to deteriorate to the extent that serious engine damage could result. But it happens, as these photos show. Here is a reminder for owners, operators, and engineers.

Engine Cooling Requirements

You may be surprised to learn that a four-cylinder Lycoming O–320 or O–360 engine needs approximately 2500 cubic feet of air per minute in a full-throttle climb at 70 to 80 knots, to ensure the necessary level of cooling for the engine. This is approximately the amount of air in a 20-foot shipping container, every two minutes!

Correctly installed baffle seals in good condition.

The forward speed of the aircraft converts the effective velocity of the airstream going into the cowl into a 'pressure parcel' of air in the upstream 'cold air plenum' – proper sealing of this is a must. If air is allowed to escape from this plenum, it will not only result in a loss of pressure, and therefore an overall reduction in cooling efficiency, but may also cause localised areas of overheating. Baffle seal deterioration can contribute to such conditions as high cylinder head temperature, high oil temperature/low oil pressure, and valve sticking due to carbon formation in the valve guides.

As guidance material, one aircraft manufacturer states that the combined area of 'waste air leak' should be limited to a maximum of 1 to 2 square inches (6 to 13 square centimetres). When one considers the total area of baffle seal contact, a number of small gaps would soon add up to exceed these limitations.

Fortunately, our temperate New Zealand climate has probably saved some engines from damage, even though their baffle seals have been somewhat below par. A temperate climate, however, is no reason to be complacent about baffles and baffle seal maintenance.

When removing cowlings for engine inspection, take a few seconds to check for baffle seal witness marks around what should be the full plenum contact area. The lack of witness marks is often a clear indication of the seals not doing the job efficiently. Gaps can often be easily spotted by darker coloured streaks where the air has escaped from the plenum area.

Installing Cowlings

When you are installing cowlings, take care to ensure that all the seals are 'seating' correctly. After the cowling is secured, take the time to have a look in through the cowl intake, with a torch if required. Most of the smaller to medium single-engine aircraft will have enough access to be able to see that the baffle seals are seated correctly.

It only takes one section of seal material to be inadvertently reversed when fitting a top cowling for the 'cold air plenum' pressure to be reduced from the aircraft manufacturer's original specification as tested for the original Type Certification of the aircraft.

Baffle Seal Materials

The aircraft manufacturer will have chosen a seal material that has been proven to meet a design standard suitable for the expected ambient conditions that will be present inside the engine cowling. Tightly cowled engines in the medium to high horsepower range, especially those that are turbocharged, will generally have very flexible high temperature resistant seal materials used.

You could, no doubt, purchase some commercial rubber product from your nearest hardware shop cheaper than the genuine required seal material, but this would not meet the standard legally required for a type certificated aircraft. In addition, such material would most likely fall well short of the original manufacturer's specifications and place your engine at risk.

Old, torn and perrished baffle seals lead to loss of cold air pressure resulting in engine overheating.

Summary

Do not put up with poor baffle seals on the basis that the complete engine overhaul is looming anyway. You should consider baffle seals to be either serviceable or requiring repairs.

A good working relationship between the owner/operator and chosen maintenance contractor should provide for an overview of conditions found during maintenance. Defective baffle seals are a problem to be addressed immediately.

And remember to always check to see that your baffle seals face in the correct direction when closing engine cowlings.

Prevention of possible engine damage due to poor baffle sealing is significantly more cost effective than engine repairs. ■

406 MHz ELT NPRM

SWITCH TO 406 DISTRESS BEACONS www.beacons.org.nz

From 1 February 2009, satellite monitoring and processing of 121.5 MHz and 243 MHz signals by the international COSPAS-SARSAT system will cease. The limitations of the 121.5 and 243 MHz signal characteristics, together with the high number of false alerts generated by 121.5 MHz emergency locator transmitters (ELT), have led the international agencies involved in search and rescue, the International Maritime Organisation (IMO), and the International Civil Aviation Organisation (ICAO), to require ELTs to operate on both 406 MHz and 121.5 MHz.

The 406 MHz signal provides the COSPAS-SARSAT system with an initial alert and location. The Rescue Coordination Centre NZ (RCCNZ) can cross-reference the digital signal emitted by 406 MHz beacons with a database of registered 406 beacon owners, identifying exactly who is in trouble and their category – land, sea, or air. The 121.5 MHz signal is then used for final homing by search and rescue personnel.

To address these changes, the CAA issued a Notice of Proposed Rule Making (NPRM) for public consultation on 22 June 2006.

Advances in microlight aircraft construction now mean this type of aircraft is capable of longer cross-country operations, putting the pilots and passengers of microlights into the same search and rescue situation as the pilots and passengers of aircraft that currently require an ELT. It would be impracticable, however, to fit an automatic ELT in some models of microlight aircraft. The CAA, therefore, plans to treat these aircraft the same as gliders and require pilots to carry a personal locator beacon (PLB) when operating more the 10 NM from the aerodrome of departure, if their aircraft is not fitted with an automatic ELT.

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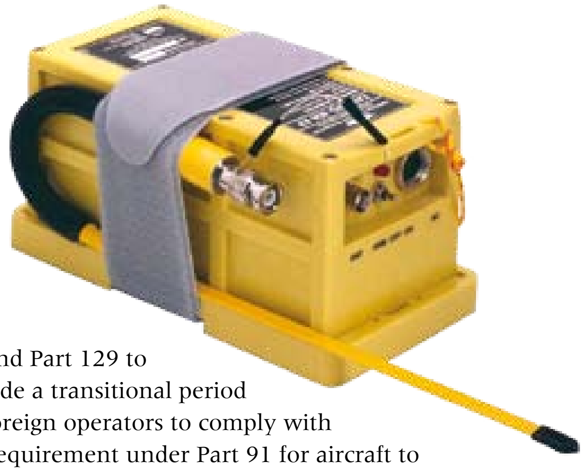
The other changes proposed in this NPRM are to:

- Amend Part 91 to mandate the change to 406 MHz and 121.5 MHz for ELTs, PLBs, and emergency position-indicating radio beacons (EPIRB), and to implement the registration and coding requirements associated with the 406 MHz function. (EPIRBs are manually activated maritime beacons designed to float upright. They are used in the aviation environment in life rafts aboard aircraft.)
- Amend Part 91 Appendix A.15 to reflect the standards associated with ELTs, EPIRBs, and PLBs operating on the changed international standard frequencies.
- Amend Part 43 to reflect revised maintenance requirements for the 406 MHz ELT.
- Amend Part 121 Subpart F to remove the current dispensation regarding installation of an automatic ELT, to include the requirement for an additional ELT, and to include an appropriate transition period for compliance with the ELT requirements.



- Amend Part 129 to provide a transitional period for foreign operators to comply with the requirement under Part 91 for aircraft to be equipped with an automatic ELT.
- Amend Part 1 to include definitions and abbreviations used in the operating rules that are not currently included in Part 1.

The NPRM can be viewed on the CAA web site, www.caa.govt.nz, under "Rules & more". Submissions on the proposed rules close on 31 July 2006 and should be forwarded to the Docket Clerk, email: docket@caa.govt.nz. ■

Infringement Notice System

On 1 August 2006 the new Civil Aviation (Offences) Regulations 2006 will come into effect. These regulations prescribe those breaches of the rules which constitute summary and infringement offences as well as setting the fines and the level of infringement fees.

These regulations enable the CAA to issue an infringement notice for a number of rule breaches.

Rob Scriven, the manager of the CAA's Law Enforcement Unit, believes there are many benefits.

"Although there have been considerable delays in implementing this process, it is clear from experiences overseas that the issue of an infringement notice can be a very effective tool in modifying behaviour and ensuring future compliance, without actually generating a criminal conviction.

"Until now, the enforcement actions available have been either a written warning, or prosecution. It is intended that the infringement notices will fit between those two options. It is likely that those rule breaches at the more serious end of the written warning spectrum and the less serious of the summary prosecutions will be dealt with by the infringement process.

"We hope that when the substantial infringement fees are paid, word will quickly spread through the industry and deter others from breaching the rules, which can only make the skies safer for all users," says Rob Scriven.

Unlike road traffic offences, this is not an instant-fine system. The Director will issue an infringement notice only after a full and thorough investigation has been carried out. The Director will need to be satisfied that there is sufficient evidence to issue an infringement notice and that it is in the public interest to do so. The investigation process will enable individuals or organisations suspected of breaching the rules an opportunity to respond to the allegation, and to provide information that they believe is relevant, to ensure the Director is fully informed before taking enforcement action.

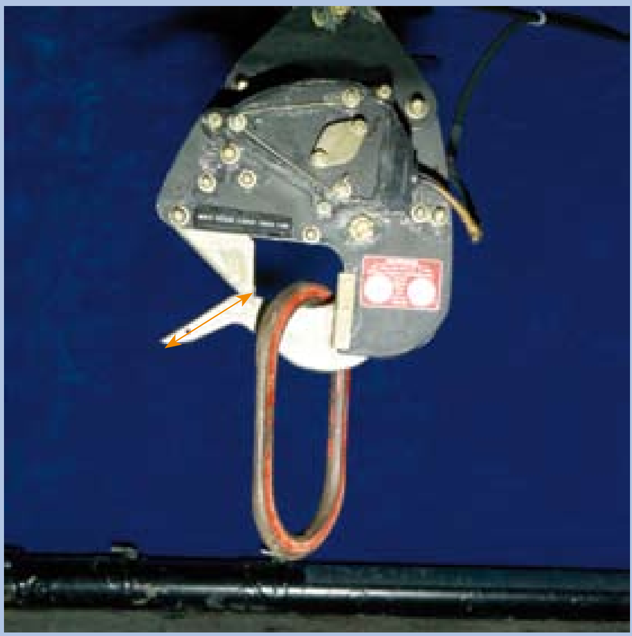
Generally, those who receive an infringement notice can either accept the notice and pay the infringement fee, or request a defended hearing where the evidence will be tested in a District Court. A full description of the rights available following the issue of an infringement notice are prescribed in the Summary Proceedings Act 1957 and are listed on the infringement notice.

The highest infringement fee is $2000 for an individual, or $12,000 for a body corporate.

For further information, contact: Rob Scriven, Tel: 0–4–560 9431, or Email: scrivenr@caa.govt.nz ■

How to Keep Your Sling Load

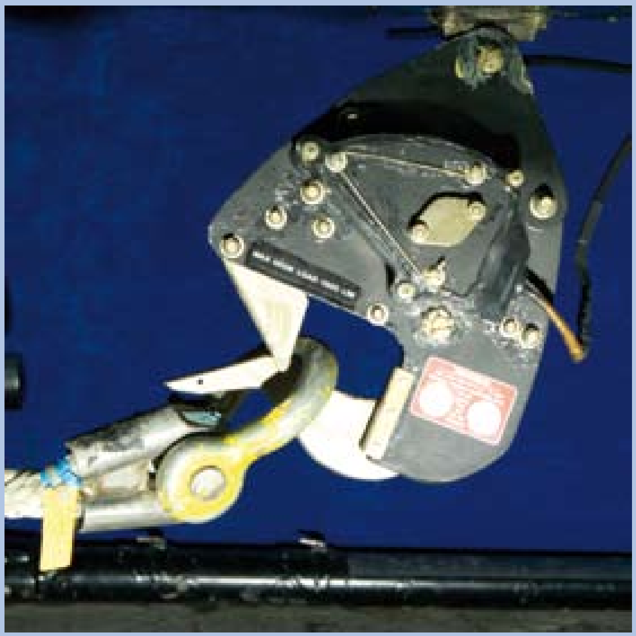
In recent years, several underslung loads have been lost from helicopters, giving both the pilot and the ground crew a nasty fright. Some of the resulting insurance claims have been considerable, and subsequent investigation in many cases has found no abnormality in the operation of the cargo hook. There is a way, however, that a load can be lost from a cargo hook, best demonstrated by the the following series of photographs.



An oblong link is used to attach the underslung load to the hook. Note that the length of the link's long axis is greater than the distance from the spring gate to the end of the tang (indicated by arrow).

This picture simulates either a violent load swing, or the inadvertent raising of the link by means of the load strop while the helicopter is on the ground.

Once the link long axis is above the hook tang, a pull back towards the mouth of the hook will release the spring gate. Goodbye load!



A smaller link or shackle cannot rotate past the tang, and thus cannot self-release as in the previous example.

New Products

Weight and Balance

A revised edition of the Good Aviation Practice (GAP) booklet, *Weight and Balance,* is now available. The booklet emphasises the importance of calculating weight and balance in preparation for flight and takes the reader through worked examples. It includes a template readers can reproduce for their own use.

The revision includes a mention of aerobatic aircraft and how critical weight and balance can be in aerobatic situations. It also has a section for multi-engine aeroplanes.

This GAP booklet is available free from most flight training schools and aero clubs, from your local Field Safety Adviser, or you can request copies by email: info@caa.govt.nz. All the CAA safety education booklets, posters, and videos are listed on the CAA web site, www.caa.govt.nz, by clicking on "Safety information – Publications".

How to get Aviation Publications

Rules, Advisory Circulars (ACs), Airworthiness Directives

All these are available for free from the CAA web site, www.caa.govt.nz. Printed copies can be purchased from 0800 GET RULES (0800 438 785).

AIP New Zealand

AIP New Zealand Vols 1 to 4 are available free on the internet, www.aip.net.nz. Printed copies of Vols 1 to 4 and all **aeronautical charts** can be purchased from Aeronautical Information Management (a division of Airways New Zealand) on 0800 500 045, or their web site, www.aipshop.co.nz.

Pilot and Aircraft Logbooks

These can be obtained from your training organisation, or 0800 GET RULES (0800 438 785).

Planning an Aviation Event?

Do you have an event such as an airshow, air race, rally or major competition coming up soon? If so, you need to have the details published in an *AIP Supplement* to warn pilots of the activity in a timely manner. The information should be submitted to the CAA with adequate notice. (Refer to AC 91–1 *Aviation Events.*)

Please send the relevant details to the CAA (ATS Approvals Officer or AIP Editor) **at least** one week before the appropriate cut-off date indicated below.

Supplement Cycle	*Supplement Cut-off Date (with graphic)*	*Supplement Cut-off Date (text only)*	*Supplement Effective Date*
06/11	17 Aug 2006	24 Aug 2006	26 Oct 2006
06/12	14 Sep 2006	21 Sep 2006	23 Nov 2006
06/13	12 Oct 2006	19 Oct 2006	21 Dec 2006

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Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT
(0508 222 433)

The Civil Aviation Act (1990) requires notification "as soon as practicable".

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)

For all aviation-related safety and security concerns

OCCURRENCE BRIEFS

LESSONS FOR SAFER AVIATION

The content of *Occurrence Briefs* comprises notified aircraft accidents, GA defect incidents, and sometimes selected foreign occurrences, which we believe will most benefit operators and engineers. Individual accident briefs, and GA defect incidents are now available on CAA's web site **www.caa.govt.nz**. Accident briefs on the web comprise those for accidents that have been investigated since 1 January 1996 and have been published in *Occurrence Briefs*, plus any that have been recently released on the web but not yet published. Defects on the web comprise most of those that have been investigated since 1 January 2002, including all that have been published in *Occurrence Briefs*.

ACCIDENTS

The pilot-in-command of an aircraft involved in an accident is required by the Civil Aviation Act to notify the Civil Aviation Authority "as soon as practicable", unless prevented by injury, in which case responsibility falls on the aircraft operator. The CAA has a dedicated telephone number 0508 ACCIDENT (0508 222 433) for this purpose. Follow-up details of accidents should normally be submitted on Form CA005 to the CAA Safety Investigation Unit.

Some accidents are investigated by the Transport Accident Investigation Commission (TAIC), and it is the CAA's responsibility to notify TAIC of all accidents. The reports that follow are the results of either CAA or TAIC investigations. Full TAIC accident reports are available on the TAIC web site, **www.taic.org.nz**.

ZK-MBG, Piper PA-28-161, 18 Mar 03 at 17:47, Tokomaru. 1 POB, injuries nil, damage substantial. Nature of flight, training solo. Pilot CAA licence PPL (Aeroplane), age 20 yrs, flying hours 129 total, 124 on type, 19 in last 90 days.

The pilot declared a MAYDAY when carrying out forced landing practice, as he was unable to initiate a go-around. The aircraft ran into a ditch at the end of the paddock. At the engine overhaul facility, it was found that the crankshaft run out was within limits. The engine was run satisfactorily on a test truck. The fuel system was checked and found to be delivering fuel to the engine. The flying school investigation was unable to determine the cause of the accident. They did put in place a safety action that requires engine failure simulation to be achieved by closing the throttle only, and under no circumstances is the mixture to be set at idle cut-off.

Main sources of information: Accident details submitted by operator plus further enquiries by CAA.

CAA Occurrence Ref 03/774

ZK-DHA, De Havilland DH 82A Tiger Moth, 18 Oct 03 at 14:50, Taumarunui Ad. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 54 yrs, flying hours 1490 total, 24 on type.

The aircraft was participating in an annual Tiger Moth Club event at Taumarunui Aerodrome. The aircraft had just taken off to fly a low-level circuit for a bombing competition. It commenced a right turn, and was then seen to spin to the ground where it caught fire on impact. Both occupants were killed. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 03/2955

ZK-EOA, Cessna 172N, 5 Dec 03 at 16:30, 2 km E of L Luna, Otago. 2 POB, injuries 1 fatal, 1 serious, aircraft destroyed. Nature of flight, training dual. Pilot CAA licence CPL (Aeroplane), age 28 yrs, flying hours 1236 total, 773 on type, 150 in last 90 days.

The National Rescue Coordination Centre was notified on the late afternoon of Friday 5 December 2003 that the aircraft had not returned to Queenstown after a mountain flying training flight. A local search was initiated, and the wreckage of the aircraft was found in steep and mountainous terrain in the Twenty Five Mile Creek watershed, some 2 km east of Lake Luna, at about 1935 hours. The pilot under instruction, although seriously injured, survived, but the instructor sustained fatal injuries in the accident. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 03/3531

ZK-FGA, Potez-Air Fouga C.M.170 Magister, 19 Mar 04 at 10:16, nr Kaiaua. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, Private. Pilot CAA licence PPL (Aeroplane), age 56 yrs, flying hours 1780 total, 90 on type, 0 in last 90 days.

The pilot and crewmember were conducting a flight in preparation for an air display routine at an air show when the aircraft was seen by numerous witnesses to climb and enter cloud. A short time later, the aircraft was observed to exit cloud in a steep spiralling dive that continued until the aircraft struck the sea. Both occupants were killed on impact. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 04/940

ZK-TWR, Piper PA-38-112, 29 Mar 04 at 15:30, Ruawai. 1 POB, injuries nil, damage substantial. Nature of flight, dual. Pilot CAA licence CPL (Aeroplane), age 32 yrs, flying hours 2836 total, 1611 on type, 90 in last 90 days.

During a touch-and-go the RH main undercarriage detached from the wing. The aircraft then carried out an emergency landing and sustained further damage. The operator carried out an investigation and found that one of the main gear attachment bolts may have failed from fatigue and this may have been attributed to "operational working". Associated references for the installation and inspection details for these bolts refer AD DCA/PA 38/17B and Service Bulletin Piper SB 673A.

Main sources of information: Accident details submitted by operator.

CAA Occurrence Ref 04/1046

ZK-JAN, Piper PA-34-200T, 30 Nov 04 at 09:54, Mt Taranaki. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, freight only. Pilot CAA licence CPL (Aeroplane), age 41 yrs, flying hours 2560 total, 180 on type, 11 in last 90 days.

On Tuesday 30 November 2004, ZK-JAN, a Piper PA34-200T Seneca II, was on an air transport charter flight returning to Nelson from New Plymouth with the pilot and one passenger on board. After departing New Plymouth and obtaining approval to operate up to 8500 feet under visual flight rules, the aircraft struck Mount Taranaki / Egmont about 150 feet below the summit. The 2 occupants were killed on impact and the aircraft was destroyed.

The probable cause of the accident was the pilot unknowingly losing visual reference with the mountain. The pilot may have entered cloud as he flew south, or been unable to distinguish the snow and ice covered summit against a cloud background, or the nose of the aircraft could have obscured his view of the summit as he approached directly towards it.

Main sources of information: Abstract from TAIC Accident Report 04-007.

CAA Occurrence Ref 04/3754

ZK-JES, Cessna 172N, 15 Dec 04 at 15:00, Cable Bay. 3 POB, injuries 1 fatal, 2 serious, aircraft destroyed. Nature of flight, transport passenger A to A. Pilot CAA licence CPL (Aeroplane), age 21 yrs, flying hours 650 total, 240 on type, 131 in last 90 days.

On Wednesday 15 December 2004 at about 1450, ZK-JES, a Cessna 172, on a flight from Kerikeri to Waitiki Airstrip, ditched in Cable Bay when the pilot could no longer continue flying visually, because of the weather conditions. One of the 2 passengers drowned, and the other passenger and the pilot were seriously injured. The pilot was inadvertently caught in rapidly deteriorating weather conditions with low cloud, mist and poor visibility. The deterioration was brought about by a fast moving frontal system, which quickly lowered the ambient air temperature to that of the unusually high dew point temperature. The rapid deterioration removed the pilot's options of diverting to his alternate aerodrome or returning to his departure aerodrome. Because he could not land on a nearby beach the pilot had no option but to ditch.

Main sources of information: Abstract from TAIC Accident Report 04-008.

CAA Occurrence Ref 04/3982

ZK-EFM, NZ Aerospace FU24-950, 12 Jan 05 at 16:30, Mauriceville. 1 POB, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Aeroplane), age 65 yrs, flying hours 26370 total, 4100 on type, 135 in last 90 days.

During takeoff the aircraft engine burst into flames. The aircraft veered off the strip and through a fence, damaging the propeller and airframe. An engineering investigation revealed the cause of the engine failure was the breaking of two compressor turbine blades at their root due to fatigue failure. The broken blades subsequently damaged other blades and parts in the engine gas path. The investigation involved a CAA person in conjunction with the STC holder visiting the Walter factory at Prague to witness the stripping of this engine and discuss previous Walter engine failures. As a result of this visit, Walter engineers came to New Zealand and replaced the compressor turbine wheel and blades on an engine currently operating in New Zealand. The removed turbine blades were returned to the Walter factory to be critically examined by their metallurgy section. The Walter engineers also conducted two seminars in the North Island and one in the South Island for operators and engineers associated with the Walter engine.

Main sources of information: Accident details submitted by pilot and operator plus CAA field investigation.

CAA Occurrence Ref 05/32

ZK-LLB, Cessna 172N, 29 Jan 05 at 11:49, 7 km south Gibbston. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, policing. Pilot CAA licence CPL (Aeroplane), age 33 yrs, flying hours 3023 total, 500 on type, 178 in last 90 days.

On Saturday 29 January 2005, at 1149, Scott Air Cessna 172 ZK-LLB was on a Police cannabis plantation spotting operation from Queenstown, when it collided with the valley side in Doolans Creek Valley 7 km south of Gibbston. The pilot and Police observer were killed and the aircraft was destroyed.

While circling in a confined mountainous valley the aircraft briefly descended to a low altitude which did not conserve adequate manoeuvring margins from the valley sides. A further more rapid descent led to the aircraft colliding with the valley side in controlled flight. The cause of this further descent was not determined.

Main sources of information: Abstract from TAIC Accident Report 05-002.

CAA Occurrence Ref 05/179

ZK-JDR, Micro Aviation Bantam B22J, 31 Jan 05 at 18:30, Gordonton. 2 POB, injuries 1 serious, 1 minor, damage substantial. Nature of flight, private other. Pilot CAA licence nil, age 51 yrs, flying hours 400 total, 400 on type, 60 in last 90 days.

During a local flight a significant vibration occurred in the engine. The pilot immediately carried out an emergency landing into a paddock but was unable to prevent the aircraft from entering a ditch. The pilot suffered minor injuries and the passenger back injuries. Investigation found that the rocker assembly locking mechanism on the #2 cylinder had failed owing to fatigue, and this ultimately led to the cylinder not operating effectively.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 05/187

ZK-FMW, Piper PA-34-200T, 2 Feb 05 at 11:54, Mount Tauhara. 3 POB, injuries 3 fatal, aircraft destroyed. Nature of flight, transport passenger A to B. Pilot CAA licence CPL (Aeroplane), age 36 yrs, flying hours 2950 total, 634 on type, 85 in last 90 days.

On Wednesday 2 February 2005, ZK-FMW, a Piper PA34-200T Seneca, was on an air transport charter flight from Ardmore to Taupo with a pilot and 2 passengers on board. During the instrument approach to Taupo Aerodrome the aircraft deviated left of the published final approach track and at 1154 struck Mount Tauhara, 8 km from the aerodrome. The 3 occupants were killed on impact and the aircraft was destroyed.

No obvious cause for the accident could be determined. Autopsy reports showed the pilot had consumed cannabis, probably between 12 and 24 hours before the accident. While cannabis can adversely affect a person's ability to operate an aircraft, its effects can vary greatly in individuals, so this could not be conclusively identified as a cause of this accident.

Main sources of information: Abstract from TAIC Accident Report 05-003.

CAA Occurrence Ref 05/200

ZK-HRW, Hughes 269C, 7 Feb 05 at 15:30, Taupo. 1 POB, injuries nil, aircraft destroyed. Nature of flight, other aerial work. Pilot CAA licence CPL (Helicopter), age 40 yrs, flying hours 3047 total, 2929 on type, 139 in last 90 days.

The helicopter was topdressing when the engine misfired 2 to 3 times. An rpm drop was observed along with a substantial power loss. The pilot immediately dumped his load and attempted to land on a ridge. The helicopter hit the ridge hard, damaging the tail boom and blades. The alternator and starter cables had abraded at a crossover and shorted together, causing a 15-degree retardation of the engine timing.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 05/271

ZK-FXH, Solar Wings Pegasus XL-R, 9 Feb 05 at 12:30, Feilding. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence nil, age 93 yrs, flying hours 730 total, 600 on type, 9 in last 90 days.

The microlight made a precautionary landing after experiencing a rough running engine. The landing was heavy and the microlight ended up on its nose. The cause of the rough running engine was investigated and found to be fouled spark plugs.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 05/273

ZK-FOS, Piper PA-28-181, 28 Mar 05 at 11:23, Te Kowhai. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 39 yrs, flying hours 4624 total, 136 on type, 9 in last 90 days.

The aircraft landed well into the available length of a wet grassed runway. As a consequence, the pilot was unable to stop the aircraft within the remaining length. No injuries to the pilot and passenger were sustained, but the aircraft suffered severe damage.

Main sources of information: Accident details submitted by pilot plus further enquiries by CAA.

CAA Occurrence Ref 05/914

ZK-DHD, NZ Aerospace FU24-950, 6 Apr 05 at 09:30, Wanstead Airstrip. 1 POB, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Aeroplane), age 59 yrs, flying hours 6000 total, 4000 on type, 95 in last 90 days.

While landing on a short airstrip, possible wind shear was experienced. The aircraft sank rapidly and full power was applied but had no effect. The aircraft hit the ground heavily, resulting in substantial damage. The wind at the time was near maximum crosswind and swinging. The chief pilot spoke to the pilot and made him aware of the risks in operating in marginal conditions. Due to the heavy landing, the main damage incurred was to the RH main undercarriage, RH rear spar one third from the root end, and heavy skin under-wing buckling on the RH side.

Main sources of information: Accident details submitted by pilot and operator plus further enquiries by CAA.

CAA Occurrence Ref 05/1353

ZK-HVM, Schweizer 269C-1, 17 Apr 05 at 13:15, Kawakawa Bay. 2 POB, injuries 1 minor, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Helicopter), age 36 yrs, flying hours 1071 total, 980 on type, 255 in last 90 days.

The instructor pulled up steeply during a demonstration of a 'quick stop' manoeuvre. The helicopter collided with the top of a ridge.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 05/1207

ZK-POM, Vans RV 7A, 26 Apr 05 at 17:20, North Shore. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 58 yrs, flying hours 7172 total, 1 on type, 109 in last 90 days.

The aircraft landed on Runway 21 and bounced as it crossed an intersecting runway. When the nose was lowered on the ensuing touchdown, the nosewheel dug into the runway surface and collapsed. This caused damage to the propeller, engine-frame and tail cone.

Main sources of information: Accident details submitted by pilot and engineer.

CAA Occurrence Ref 05/1314

ZK-NRC, Cessna A185F, 14 May 05 at 10:00, Waione. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licences CPL (Helicopter) PPL (Aeroplane), age 25 yrs, flying hours 1347 total, 108 on type, 73 in last 90 days.

The aircraft touched down and had rolled approximately 20 to 30 metres when a severe wind shear forced the aircraft to weathercock to the right. The pilot's inputs were unable to correct the change in aircraft heading. The left wheel dug into soft ground and broke off. The aircraft then rolled on to its back, which caused substantial damage.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 05/1511

ZK-MSL, Piper PA-34-200T, 7 Jul 05 at 08:52, Napier Ad. 2 POB, injuries nil, damage substantial. Nature of flight, freight only. Pilot CAA licence CPL (Aeroplane), age 24 yrs, flying hours 1368 total, 240 on type, 60 in last 90 days.

On Thursday 7 July 2005 at 0852, the pilot of ZK-MSL, a Piper PA34 Seneca II, intentionally landed the aircraft at Napier Aerodrome with the landing gear retracted after both normal and emergency procedures failed to extend the nose landing gear. The pilot and the sole passenger were not injured. Aircraft damage was largely confined to the propellers. The nose gear had failed to extend because the centering spring attachment bolt had jammed against the nose gear door aft tube assembly. The bolt had been installed incorrectly 9 weeks earlier during maintenance. Contributory factors were overloading of the nose baggage compartment and a possible lack of rigidity in the nose cone.

Main sources of information: Abstract from TAIC Accident Report 05-007.

CAA Occurrence Ref 05/2195

ZK-EGV, NZ Aerospace FU24-950, 26 Jul 05 at 07:05, Manawahe. 1 POB, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Aeroplane), age 36 yrs, flying hours 3190 total, 1490 on type, 200 in last 90 days.

The pilot had landed on a farm airstrip and was between landing roll and taxi when the left main undercarriage wheel dropped into a washout. This caused the aircraft to pitch backward, striking the tail on the ground. Then the nose came down, and the propeller struck the ground.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 05/2339

ZK-HDI, Robinson R22 Beta, 7 Sep 05 at 15:30, Whataroa. 1 POB, injuries 1 minor, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Helicopter), age 65 yrs, flying hours 1468 total, 77 on type, 12 in last 90 days.

The helicopter rolled over after the main rotor contacted an object while approaching to land. The pilot failed to maintain separation from trees surrounding the landing site.

Main sources of information: Accident details submitted by pilot plus further enquiries by CAA.

CAA Occurrence Ref 05/2902

ZK-GVW, Schleicher ASW 20, 1 Nov 05 at 15:00, Murupara. 1 POB, injuries 1 minor, damage substantial. Nature of flight, private other. Pilot CAA licence nil, age not known, flying hours 600 total, 100 on type, 10 in last 90 days.

The pilot attempted an outlanding. Due to sustained heavy sink, the airstrip at Kaingaroa could not be reached. As much of the terrain was planted in pine forest, a landing on State Highway 38 became the only option. On late final, just before touchdown, the left wingtip caught an overhanging branch, which caused the aircraft to groundloop.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 05/3468

ZK-EOX, Cessna 172N, 9 Nov 05 at 13:00, Kerikeri. 1 POB, injuries nil, damage substantial. Nature of flight, training solo. Pilot CAA licence PPL (Aeroplane), age 26 yrs, flying hours 138 total, 138 on type, 20 in last 90 days.

After touchdown the aircraft veered off the runway and hit a fence. The propeller was damaged after taking out a number of fence posts. The pilot had used inappropriate techniques for landing in crosswind conditions, and it was apparent from the aerodrome forecast that there would have been a significant downwind component.

Main sources of information: Accident details submitted by pilot plus further enquiries by CAA.

CAA Occurrence Ref 05/3559

ZK-HZT, Robinson R22 Beta, 7 Dec 05 at 12:30, L Selfe. 2 POB, injuries nil, damage substantial. Nature of flight, survey/inspection. Pilot CAA licence CPL (Helicopter), age 47 yrs, flying hours 1100 total, 950 on type, 140 in last 90 days.

The helicopter was hovering over a lake when it experienced a loss in rotor rpm and descended into the water. The carburettor heat had been left in the ON position while approaching the hover. The decrease in performance was such that a hover could not be maintained.

Main sources of information: Accident details submitted by pilot and operator plus further enquiries by CAA.

CAA Occurrence Ref 05/3984

ZK-WEC, Murphy Rebel, 10 Jan 06 at 10:20, Limestone Downs. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 64 yrs, flying hours 783 total, 239 on type, 19 in last 90 days.

During landing, a sheep ran across the airstrip and took out the right undercarriage leg, causing the aircraft to skid sideways into a ditch. The aircraft suffered damage to the main undercarriage attachment area, the right wing tip and propeller.

Main sources of information: Accident details submitted by pilot plus further enquiries by CAA.

CAA Occurrence Ref 06/4

ZK-FSB, Piper PA-38-112, 21 Feb 06 at 09:55, Whenuapai Ad. 2 POB, injuries nil, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Aeroplane), age 24 yrs, flying hours 1677 total, 1028 on type, 174 in last 90 days.

The aircraft had just taken off when the engine began to run roughly. The instructor selected carburettor heat but this did not help. The aircraft landed safely in a field, but the undercarriage separated during the landing roll. Carb icing was suspected to have caused the engine rough running.

Main sources of information: Accident details submitted by operator.

CAA Occurrence Ref 06/463

GA DEFECT INCIDENTS

The reports and recommendations that follow are based on details submitted mainly by Licensed Aircraft Maintenance Engineers on behalf of operators, in accordance with Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics*. They relate only to aircraft of maximum certificated takeoff weight of 9000 lb (4082 kg) or less. These and more reports are available on the CAA web site, www.caa.govt.nz. Details of defects should normally be submitted on Form CA005 or 005D to the CAA Safety Investigation Unit.

The CAA Occurrence Number at the end of each report should be quoted in any enquiries.

Key to abbreviations:

AD = Airworthiness Directive	**TIS** = time in service
NDT = non-destructive testing	**TSI** = time since installation
P/N = part number	**TSO** = time since overhaul
SB = Service Bulletin	**TTIS** = total time in service

Aerospatiale AS 350D

Eurocopter AS350D Fuel Boost Pump Drive Spring P/N 4P94-068

Fuel pressure on the Aerospatiale AS 350D failed to come up when the booster pump was turned on for starting, but the pump motor could be heard running. Investigation revealed the fuel boost pump drive spring was broken. TSI 421.2 hours.

ATA 7300 CAA Occurrence Ref 05/3779

Aerospatiale AS 355 F1

Rotor Blade

During an inspection, the helicopter was found to have cracked skin on the upper and lower sides of the main rotor blade (MRB), within a metre of the hub. The crack extended over 6 inches across the blade. According to the manufacturer's agents, these cracks have been caused by excessive flexing due to the omission of MRB tiedowns during the time that the helicopter is on the ground.

ATA 6200 CAA Occurrence Ref 05/2500

Bell 206B

Bell 206 Tail Rotor Blade P/N 206-016-201-133

During the pre-flight inspection the helicopter was found to have a crack in one of the tail rotor blades, adjacent to the trailing edge balance weight. DCA/BELL206/78B requires certain part number and serial number tail rotor blades to be inspected for cracks in accordance with Bell Helicopter ASB 206L-04-127 every 100 hours TIS. The blades in this occurrence, however, were not covered by the AD or Bell service bulletin, so the maintenance organisation advised the manufacturer of this. TSI 26.9 hours, TTIS 162.9 hours.

ATA 6410 CAA Occurrence Ref 05/1221

Bell 206B

Bell 206 B Freewheel Assembly P/N CL422SO-1

It was reported that when the aircraft was shut down the freewheel was locking up. On disassembling the clutch assembly, it was found that one partially seized element had cracked the sprag cage, and the inner shaft had heavy brinnelling. The inner shaft, clutch assembly and two bearings were replaced. A defect maintenance report was provided to the aircraft manufacturer. The defect was consistent with operating the helicopter at its performance limits, but it was detectable through normal scheduled inspections. TSO 476.9 hours, TTIS 881.3 hours.

ATA 6300 CAA Occurrence Ref 05/3396

Cessna 402C

Lighting supply transistor Q3 P/N 2N3055

During climb-out the pilot noticed the instrument panel lights flicker and then go out. He adjusted the rheostat and they came on briefly but were accompanied by smoke before they went out again. He made a PAN call and returned to the aerodrome. The primary cause was random failure of the lighting supply transistor Q3. This caused excessive current to flow through resistor R9, which resulted in overheating of the resistor and smoke in the cockpit with subsequent loss of pilot flight instrument lighting. The faulty transistor and resistor were replaced, and no further problems were evident.

ATA 3310 CAA Occurrence Ref 06/298

De Havilland DH 82A Tiger Moth

De Havilland DH 82A Chain guide

While practising an aerobatic routine the pilot increased the speed to 120 mph, raised the nose for a slow-roll manoeuvre, then checked forward to reduce the G-loading, and applied left aileron. He was unable to get full aileron; the stick would not go past about a third of its normal movement. The aircraft was returned to straight and level and appeared to fly normally so returned to Masterton and landed. The aileron travels were checked on the ground and everything appeared to be normal. Investigation revealed that when the aileron cables were pulled down at the RH aileron chain quadrant, the chain did not feed onto the inline sprocket, jamming on it. When released, the chain and sprocket would become unjammed. It was found that a metal chain skid and guide and wooden height packer were missing and were never installed. A skid plate and packer were made up as per modification British Aerospace TNS 5 Issue 1 Mod No 125, and the rest of the modification was checked for compliance. Refer to AD DCA/DH82/124A. The aileron cable tensions were also checked and found satisfactory. TTIS 3238 hours.

ATA 2710 CAA Occurrence Ref 06/19

Pacific Aerospace Cresco 08-600

PAC Cresco 08-600 Rear Fuel Pump P/N 2C6-2

During a scheduled inspection, the rear fuel pump was found to be seized and the brush holder melted. The failure may have been due to a faulty relay causing the pump to remain on continuously. A new pump was fitted.

ATA 2820 CAA Occurrence Ref 05/2993

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