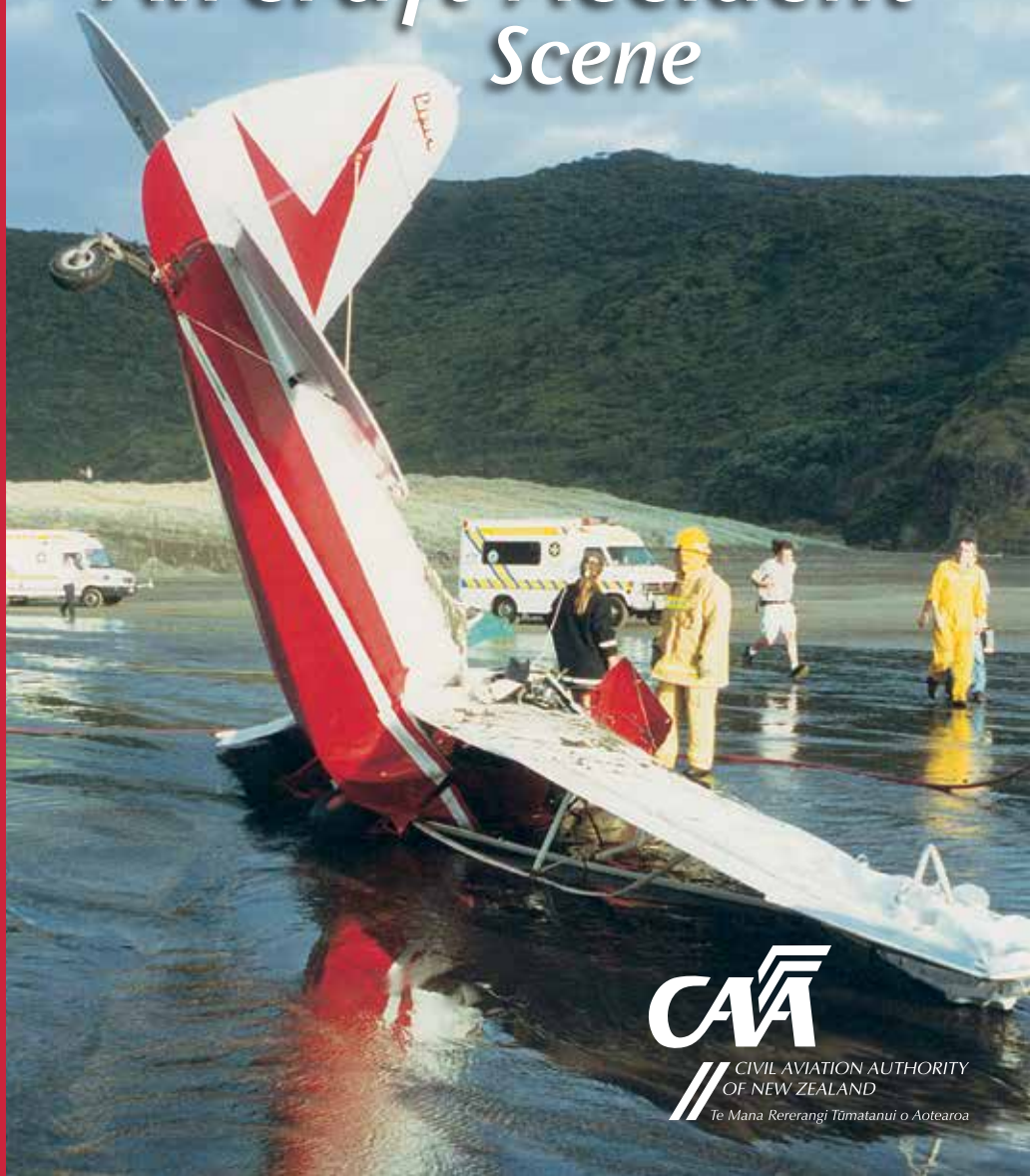


How to Deal with an Aircraft Accident Scene

How to...



CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

Te Mana Rererangi Tūmatanui o Aotearoa

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This booklet has been prepared by the Safety Investigation Unit of the Civil Aviation Authority of New Zealand (CAA) to provide guidance to the police, emergency services personnel, and others in relation to aircraft accidents. It provides information on the actions to be taken should they witness, or be required to attend, an aircraft accident.

What is an Accident?

An accident is defined in the Civil Aviation Act 1990. Briefly, it is an occurrence involving the operation of an aircraft from the time of boarding to the time the engines stop and all persons have left the aircraft. It is an occurrence in which a person is fatally or seriously injured, or in which the aircraft sustains substantial damage, or where the aircraft is missing or inaccessible.

Investigation Responsibilities

The prime responsibility for accepting notification of, investigating, and reporting aviation accidents (and serious incidents) rests with the CAA. The CAA is required to notify the Transport Accident Investigation Commission (TAIC) of all accidents and serious incidents, whereupon TAIC will decide if it is appropriate for it to investigate.

Note that accidents involving military aircraft are normally investigated only by the RNZAF unless a civilian aircraft is also involved. Notification of military accidents should be made to the duty officer at the nearest RNZAF base. If in doubt, contact the CAA accident reporting number **0508 ACCIDENT** (0508 222 433) and the CAA will then, if necessary, pass the notification on to the RNZAF.

CAA Safety Investigation

CAA safety investigators review accidents for the sole purpose of improving aviation safety. The Safety Investigation Unit does not undertake investigation in order to apportion blame or liability.

The information gained from a safety investigation may result in safety recommendations, rule changes, Airworthiness Directives, changes to a company's operating procedures, or perhaps recommendations of an educational nature.

Notification of an Accident

Telephone **0508 ACCIDENT** (0508 222 433) anytime to report an accident.

This number will reach the duty Search and Rescue (SAR) coordinator who will advise the CAA Duty Investigator and TAIC. Once it has been decided which organisation will investigate, the person who originally reported the accident will normally be contacted by the investigator in charge.

For reporting safety concerns, or requesting safety advice, telephone the CAA on **0508 4 SAFETY** (0508 472 338) during working hours. This will reach the CAA Safety Investigation Unit.



The CAA is required to investigate aviation accidents. The extent of the investigation may vary significantly depending on the severity of the accident. The investigation may be conducted as a full field investigation with one or more investigators on site for as long as necessary to gather sufficient information, or as an office-based investigation if it is felt that field enquiries will not provide any additional information.

TAIC

TAIC investigates aviation accidents (it also investigates rail and marine accidents) that it believes have significant implications for transport safety. TAIC does this independently from the police and safety authorities.

The TAIC Act directs their resources towards the in-depth investigation of those

accidents most likely to yield maximum public safety benefit. This gives TAIC some discretion in deciding which accidents it investigates.

In practice, this means that TAIC will normally investigate those accidents involving air transport operations. The police and other agencies, however, should continue to notify the CAA of all accidents so that the CAA can meet its statutory obligations.

Who is Required to Notify the CAA of an Accident?

The responsibility to notify the CAA of an accident rests principally with the pilot-in-command (PIC). This should be done as soon as is practicable after the accident.



In the event that the PIC is unable to notify the CAA, responsibility then rests with the operator of the aircraft.

In some circumstances, however, an operator may not become aware that their aircraft has been involved in an accident until quite some time after the event. Thus any person becoming aware of an accident is encouraged to notify the CAA as soon as possible.

Information to be Notified

The notification of any aircraft accident should contain as much of the following information as possible. Do not delay notification though, because of the lack of any of this information.

- Date and time of the accident.
- Nature of the accident.
- Aircraft type and registration. (Registration markings are normally three letters, sometimes prefixed with “ZK–”.)
- Name of the operator or owner.
- Location of the accident, including how to get there.
- Name of the pilot in command.
- The type of operation (air transport, training, private, etc).
- Aircraft’s last departure point and its destination.
- Description of the weather.
- Number of persons on board.
- Number of crew and/or passengers killed or seriously injured as a result of the accident.

- Number of persons killed or seriously injured as a result of the accident that were not crew or passengers.
- Details of the damage to the aircraft.
- Name of the person reporting the accident, and the best telephone number for contacting them in the days immediately following the notification.

Custody and Protection of Aircraft Wreckage

It is important that the aircraft, and any marks made by it at the scene of the accident, are not disturbed unnecessarily. This requirement should not, however, prevent or impede any of the following:

- The extrication of survivors and animals from the wreckage.
- The protection of the wreckage, or contents, including mail or cargo, from destruction by fire or other cause.
- The removal of the aircraft and its contents to a place of safety when the aircraft is in or near water (eg, below the high-tide mark on a beach).
- The removal of the wreckage to prevent obstruction to public access or to other aircraft using the area, if no practical alternative is available.
- The removal of goods or baggage under the supervision of a police officer. In the case of an aircraft that has come from outside New Zealand, the goods

or baggage shall not be removed from the vicinity of the aircraft – except with the consent of a customs officer.

In almost all accidents, no further unsupervised disturbance of the wreckage should be necessary after the occupants have been extricated.

The provisions of the Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics* mean that any aircraft involved in an accident effectively comes under the jurisdiction of the investigating authority. This means that even the pilot or owner does not have the right to access the aircraft without being authorised by the investigator in charge. It is accepted, however, that when an aircraft owner's property is likely to receive further damage following an accident they, or their representative, may have access provided they are under the supervision of a police officer.

Even if no field investigation is to be carried out, a clearance is still required from the CAA for the wreckage to be moved off the site.

Assisting the Investigation

Generally, police, fire, or ambulance personnel will be at the scene of an aircraft accident soon after it occurs. The accident investigator(s) may not reach the scene until several hours later, and possibly not until the following day. There are a number of ways the investigation can be assisted during this waiting period.

Some of the precautions that should be taken are described as follows:

- If disturbance of the wreckage is unavoidable, an endeavour should be made to photograph, sketch, or otherwise note the state of the wreckage prior to the disturbance. After disturbance, no attempt should be made to restore the wreckage to its original state, except as requested by the investigator.
- A careful record should be made, as soon as possible, of the positions in the aircraft wreckage from which any occupants were assisted.

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'Witness marks', such as the ones left by rotor blades in this picture, can provide investigators with vital clues as to the accident cause. Investigators placed a strut in one of the holes to show the angle of the blades when they struck.



A police officer stands guard over the luggage content of an aircraft that crashed shortly after takeoff.



Protecting the evidence at an accident site from interested on-lookers is important – especially when it is very accessible to the public.

Wreckage Recovery and Salvage



When on-site investigation activity is complete, the investigator in charge may hand over the wreckage to the owner.

There will be occasions when the investigating authority requires some or all of the wreckage for off-site examination. On those occasions the investigator will work with the owner, possibly through the insurer, to arrange for recovery. The investigating authority will normally only cover costs that are directly associated with investigation activities.

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- A photographic or sketch record should be made of any marks on the ground or on the wreckage, that might be obliterated or altered before the arrival of the investigator.
- The wreckage, and any of the aircraft's contents or papers, should be secured against loss or further damage.
- The position of any scattered wreckage located away from the main accident site should be noted, and measures taken to ensure that it is not disturbed.
- The names, addresses, telephone numbers, and intended movements of any witnesses should be noted. This same action should be taken in respect of any people who have taken photographs or video of the wreckage, or who have other evidence that might be relevant.



Vehicle tyre tracks can cause damage to witness marks, if an accident site is uncontrolled.

It is accepted that police resources do not stretch to providing a scene guard for more than the time necessary for emergency services to complete their on-site actions. Where the wreckage is accessible to the public, a private security guard may be engaged to prevent unauthorised access before the investigators arrive. The costs for this are borne by the investigating authority.

Hazardous Materials

There can sometimes be a variety of hazardous substances present at an aircraft accident scene. These can include:

- Toxic chemicals that could be inhaled, or affect the skin.
- Airborne synthetic products similar in nature to asbestos fibres.
- Potentially explosive devices such as oxygen bottles, high-pressure tyres, hydraulic accumulators, and emergency parachutes (see below).
- Pathogenic substances.

Because of this, only persons essential for immediate post-accident actions (ie, police, emergency service personnel, and CAA or TAIC staff) should enter the accident site – and only after taking appropriate precautions.

All investigators have equipment to provide protection against pathogenic substances that could be present.

Emergency Parachute Systems

Some aircraft are fitted with parachutes that the pilot can deploy in a severe emergency. In order to deploy and inflate the parachute rapidly they are propelled by small rocket motors, so they are often referred to as ballistic parachutes. These systems are more commonly found on microlight aircraft but some certified aircraft are also using them.

If an aircraft fitted with an emergency parachute system is involved in an accident, but the parachute is not deployed, the rocket motor can be a serious threat to emergency personnel.

Rescuers Beware

Beware of the potential of these devices. The rocket motors can accelerate to over 200 kph in the first tenth of a second after ignition. They don't fire for long, but could cause serious injury or even death.

Keep in mind that a badly damaged aircraft may have already put the activating housing of an emergency parachute into a stretched state and this may make it close to detonation.



Recognising an Emergency Parachute System

The firing handle (usually red) is mounted close to the pilot's seat. A cable will run from the handle to the parachute housing. The housing is usually external and obvious on microlight aircraft, but on larger aircraft they are often built-in behind a frangible panel.

The housing is usually a cylinder that can vary in size with the size of parachute, but is typically about 50 cm in length and 20 cm in diameter. The most common brand is Ballistic Recovery Systems (BRS) and their cylinders are white with the BRS branding showing prominently on them.

Attached to this will be a smaller cylinder, usually about 40 cm in length and 5 cm in diameter. This is the rocket motor and the cable from the firing handle will enter one end of it.

The rocket motor itself has two parts. The launch body, which will leave the launch tube when fired (and contains a propellant), and the igniter or trigger, which remains in the launch tube after detonation (this has shotgun primer and a thermalite charge). The open end, or the cap-covered end, of the launch tube is the exit point for the rocket – this is the dangerous end. No one should ever be in front of this end of the launch tube.

These parts could become separated during an accident sequence. The launch body (rocket) is a red anodised canister about the size of a large beer can. The igniter is smaller in length, aluminium coloured, and about 8 cm long with a nozzle aperture on it.

Making it Safe

This procedure should be carried out by trained rescue services personnel.

The firing mechanism requires a deliberate pull of 30 to 40 pounds to cock and fire the rocket. This equates to about 1.5 cm of movement on the cable at the trigger, but if the mechanism has suffered damage, it could be fired with much less movement.

Ordinary bolt cutters should **not** be used as they will tend to squeeze the cable housing out of the cutting jaws.

The cable should be cut with a specialised cable cutter tool, and as close to the rocket tube cable entry point as possible. When cutting the cable, care must be taken to avoid twisting the cutters.



Once the cable is cut, the unit can be considered safe to work around, but it is advisable to remove it to a safe location as soon as possible. Advice should then be sought from the police on disarming the rocket.

The instructions above apply to the BRS brand parachute system. Other brands are: Pioneer, Second Chantz, Advanced Ballistic Systems, Galaxy, or GQ Security. These systems are similar, but not identical.



Post-mortem Examinations

Post-mortem examinations are usually carried out on the bodies of all crew and passengers dying as a result of a civil aircraft accident.

The aim of such an examination is:

- to ascertain the cause of death.
- to identify the deceased.
- to obtain evidence either of pre-existing disease, or of the nature of the injury suffered, that may assist in identifying the cause of the accident.
- to obtain knowledge of mechanisms of injury, that may be applied towards the prevention of injury in future accidents.

Where possible, the pathologist responsible for an air accident post-mortem should have some knowledge of aviation-related injuries. There is at least one of these pathologists in each major centre.

If not, the local pathologist will generally know the location of the nearest aviation pathologist.

The Principal Medical Officer of the CAA (04 560 9400) or TAIC (04 473 3112) can supply contact details for an aviation pathologist if required.

Coordination with Police Inquiries

If the investigation of an aircraft accident has to be coordinated with police inquiries of any sort, such as in respect of some criminal offence, the investigator will provide assistance. In the event that the preliminary evidence indicates that the accident was the result of some criminal act, responsibility for the investigation will normally be handed over to the police. If necessary, the CAA investigator can appear as an expert witness at the inquest, but his or her primary responsibility under the Civil Aviation Act is to investigate the accident for prevention purposes – not to apportion blame or responsibility.

In general, evidence collected by an investigator as part of an air safety investigation is not taken in a form that is readily usable in court. For example, investigators do not normally take formal statements from witnesses.

Assistance to Coroners

In the event of fatal injuries occurring, the coroner may be invited (via the police) to visit the scene to discuss progress with the investigator early in the investigation.

Persons concerned with the preparation of material for an inquest should bear in mind that technical investigations have to be of sufficient depth to satisfy accident prevention measures. This often precludes the completion of an investigation, and hence the release of findings, until some considerable time after the accident.

The CAA will make findings available to interested parties, such as next of kin and the coroner, when the investigation has been completed. The CAA accident report may be published on the CAA web site.

TAIC will send the preliminary confidential report to interested parties for their comment, before completing and publishing the final report.



Dealing with the Media



The CAA and TAIC have authorised their safety investigators to answer media enquiries in factual terms at the accident scene during the early stages of an investigation. Subsequent requests for the release of information relevant to a CAA investigation must, however, be directed to the CAA Communications Manager on 04 560 9400.

The CAA and TAIC will not release to the public the names of the crew, the passengers or the operator. The police will release the names of deceased persons once the next of kin have been informed. The name of the aircraft owner is available in the New Zealand Aircraft Register published by the CAA (available on the CAA web site).

Victim Support

Being involved in, or a witness to, an aircraft accident can deeply affect you – the extent of your reaction to the events may surprise you.

Victim Support is a community-based organisation available to, amongst others, people affected by aircraft accidents. Trained volunteers are available 24 hours a day seven days a week to provide practical advice and emotional support as, and when, it is needed. Victim Support does not make decisions for you, but it will give you the choices and options you need to make good decisions for yourself – this may include a referral to other agencies for further assistance if necessary.

Victim Support is an independent organisation. Victim Support can be contacted by calling **0800 VICTIM** (0800 842 846) at any time of day. A trained Victim Support staff member will be available to provide you with professional advice and information over the telephone, or to visit you if required.



0800 VICTIM (0800 842 846)

www.victimsupport.org.nz



Summary

Accident investigators can often learn a great deal from the wreckage, ground markings, witnesses, videos, etc, during an aircraft accident investigation.

This knowledge can be used to help prevent the same thing from happening again. If those first to arrive at the accident scene unnecessarily disturb the wreckage, the deceased, or ground markings, the opportunity to learn from it may be lost.

It is therefore very important that the advisory information detailed in this booklet is followed by those involved. Doing so might just assist investigators with that crucial bit of information they need to determine the accident cause.

Accident Checklist

The following is a summary of action items and considerations that need to be taken into account should you be a witness to (ie, first on the scene), or be required to attend, an aircraft accident.

What to Do

- Exercise caution in regard to the potential hazards at an aircraft accident site. Do no more than is necessary to preserve life, before seeking advice from the investigating authority on any hazards that may be present.
- In particular, note the state of safety harnesses and positions of occupants as they are extricated.
- Within the limitations imposed by the actions necessary to preserve life, photograph, sketch or make notes of the wreckage disposition before disturbing it.
- Contact the CAA as soon as possible – phone **0508 ACCIDENT** (0508 222 433).
- Secure the accident site, including all scattered wreckage, as well as other evidence, such as marks made by the aircraft, ground scars, etc. (**Do not** attempt to move any scattered wreckage items.)
- Obtain the names, addresses, telephone numbers, and intended movements of witnesses. Note any witnesses who may have photographic or video evidence of the occurrence.

If fatalities occur

- Check with police before any action is taken to remove bodies.
- Check with the investigator in charge, if possible, to determine if there are any special requirements for in-situ pathological examination before the bodies are removed.

If bodies need to be moved before an investigator arrives

- Carefully record the posture and position of each body (preferably with photographs and/or sketches).
- Minimise any disturbance of the wreckage during removal of bodies.
- **Do not** attempt to restore disturbed wreckage to its original state.
- **Do not** release the wreckage, or any part of it, to anyone until it is confirmed that the investigating authority has relinquished custody of the wreckage.

Need more help?

The CAA's Safety Investigation Unit is always happy to discuss any queries you may have.

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See our web site, www.caa.govt.nz, for details of more CAA safety publications.