Civil Aviation Authority Report on the Evaluation and Assessment of Coroner’s Recommendations

Air Adventures Limited
Piper PA-31-350 Chieftain ZK-NCA
6 June 2003
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Foreword

The consequences of failure when it occurs in aircraft operations can be catastrophic and the public’s expectation of safety in the sector is high. Safety in the aviation system is based on an extensive, international system of standards and practices, certification and oversight systems and ultimately the knowledge and skill of the individual participants.

A serious accident involving loss of life inevitably causes attention to be focussed on the operation of the safety system and the roles of the participants, including the CAA. Such was the case following the crash of the Air Adventures aircraft and the loss of eight lives in 2003.

The Transport Accident Investigation Commission investigated the causes of the Air Adventures crash and its report was published in March 2004. The Christchurch Coroner conducted an Inquest in hearings between July 2003 and June 2005. The Coroner’s report released in May 2006 made 30 recommendations covering a range of issues with the majority directed to the CAA. The Director of Civil Aviation accepted the report and publicly committed to address each of the recommendations and to complete the work that was already under way on the issues raised by the two reports.

The CAA established a small project team headed by the former Deputy Director of Civil Aviation to study and report on the issues. That work was undertaken during 2006 and early 2007 and regular updates were published on the CAA web site during that period.

This report summarises the work of the project team and the CAA’s consideration of the results in reaching conclusions on each of the recommendations. Changes where required have been incorporated in new Rules, advisory material or procedures supporting the CAA’s certification and monitoring of participants operating in the aviation system. A number of recommendations have been closed with no action required, while others due to the nature of the corrective action are still in progress.

This report records the seriousness of the CAA’s commitment to improving the safety achieved in the New Zealand civil aviation system.

Steve Douglas
Director of Civil Aviation
October 2007
Content and Structure of the Report

This report should be read in conjunction with the Coroner’s original report. The recommendations made by the Coroner are referenced by Coroner’s paragraph number and referred to in the following text.

For each recommendation made by the Coroner, there is a:

• statement of the Coroner’s recommendation;

• description of the process used by the CAA to evaluate and assess the recommendation;

• summary of the data and or evidence that the CAA considered with respect to the recommendation;

• statement of the conclusion reached by the CAA; and

• statement of the actions that have been, or are to be taken by the CAA.

Where the CAA has determined that there is no action to be taken with respect to the Coroner’s recommendations, information is provided to explain why that decision was taken.
Coroner’s Recommendation 552: Altitude and Visibility Requirements for Instrument Approaches

That the CAA reviews the adequacy of existing rules as to:

(i) the minimum Decision Altitude requirements for single-pilot Instrument Flight Rules; and

(ii) the minimum visibility requirements for making an instrument approach.

Evaluation Process

1. The CAA compared New Zealand Instrument Landing System minima to international standards, in particular the Joint Aviation Authorities Joint Aviation Requirements.

Information Considered

2. New Zealand Instrument Landing System minima are based on international standards that have been designed and developed over 50 years. Presently there is no body of expert opinion seeing a need for change. The CAA could not find or identify information, data or expert opinion that suggested international standards were flawed or posed significant safety risks.

3. The CAA noted evidence which suggested that raising minimum Decision Altitudes could result in more missed approaches. Specifically, the CAA noted the findings of a Transport Accident Investigation Commission report which documents a hazardous incident that was in part, caused by a higher Decision Altitude (300 feet) than is internationally accepted (200 feet). Following the Transport Accident Investigation Commission report, New Zealand rules were amended to align with international standards and practice.

4. The CAA reviewed whether it would be appropriate to have different minimum Decision Altitudes for single and two-pilot operations. However, the CAA concluded from the information available that some safety risks could be exacerbated when operators of general aviation light twin aircraft employ a mix of two-pilot and single-pilot standard operating procedures. The two operations require quite different operating philosophies and techniques. Although not required by the New Zealand Civil Aviation Rules, two-pilot operations may be scheduled because the operator has the staff available at the time. At other times of the day, passenger loadings and/or pilot duty time limitations may preclude two-pilot operation. It is important that an operator provides clear direction and guidance to its flight crew on the proper practise of each type of operation. Accordingly, it would be confusing in practice and potentially less safe to have alternate Decision Altitudes for the two types of operation.

5. Aerodrome meteorological minima for operations under Instrument Flight Rules in New Zealand are established in New Zealand Civil Aviation Rule Part 19 Subpart C – IFR Operations: Aerodrome Meteorological Minima and Minimum Altitudes. The

1 Transport Accident Investigation Commission Report 98-006
CAA compared New Zealand minima with those of the European regulator, the Joint Aviation Authority. The CAA found that the relevant Joint Aviation Requirements\(^2\) would have required a Decision Altitude of not less than 200 feet and reported meteorological visibility of not less than 400 metres with respect to the Air Adventures flight. Although worded differently, New Zealand requirements have at least the same effect as the international standards examined. The current visibility requirements in New Zealand are actually more restrictive, for example, requiring a minimum meteorological visibility of at least 800 metres for Auckland and Christchurch.\(^3\)

6. The CAA also noted that Coroner’s paragraph 551 “suggested ‘a European regulation’ which prohibits an approach if minimum visibility does not meet prescribed limits”. The current Civil Aviation Rules already meet this contingency, under New Zealand Civil Aviation Rule 135.159 *Aerodrome Operating Minima – IFR Flight*. The intent of Part 135.159 is that a pilot carrying out an instrument approach may commence an approach but may not continue descent past a prescribed point (which occurs well above the Decision Altitude) if the reported visibility is below the prescribed minima.

7. In any event, it should be noted that neither the current New Zealand Civil Aviation Authority rule nor the ‘European’ proposal would have prevented the Air Adventures pilot commencing his approach on the flight in question because the airport was open and the visibility was above minima.

**CAA Conclusion**

8. The CAA has concluded that:

- existing standards in New Zealand are in line with international standards and in some respects\(^4\) are higher than comparable international standards and practice;

- having different Decision Altitudes in situations where aircraft may be operated under both two-pilot and single-pilot procedures could lead to confusion and exacerbate existing safety risks; and

- Civil Aviation Rule 135.159 addresses the issue raised by the Coroner in his recommendation (and the paragraphs in his report preceding the recommendation) and is intended to provide that a pilot carrying out an instrument approach may commence an approach but may not continue descent past a prescribed point (which occurs well above the Decision Altitude) if the reported visibility is below the prescribed minima. However, in reviewing this recommendation it is apparent that the rule requires amendment to provide certainty that this intention is reflected in the wording of the rule.

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\(^2\) Joint Aviation Requirements Operations 1 Subpart E, Appendix 1 to JAR-OPS 1.430

\(^3\) New Zealand Civil Aviation Rule 91.413 (c), (d) and (e) *Take-off and Landing Under IFR*

\(^4\) Minimum Meteorological Visibility
**Action Taken**

9. Following the review of international standards and practice and identification of safety risks, the CAA will review Rule 135.159 to ensure that the intention is reflected in the wording of the rule.
Coroner’s Recommendation 555: Reporting of Occurrences

That the CAA examines the requirement as to reporting of occurrences to ensure understanding and consistency of application.

Evaluation Process

1. The CAA reviewed the manner in which it engages with the aviation sector to improve sector awareness of:
   - the obligation under New Zealand Civil Aviation Rule Part 12 Accidents, Incidents and Statistics to report occurrences;
   - the mechanisms available for reporting of occurrences;
   - the need to report occurrences in order to build a reliable statistical data base; and
   - the clear separation within CAA of safety investigation from enforcement roles.

Information Considered

2. The CAA is aware of its role in keeping the aviation community informed regarding its obligations to report occurrences and in allaying concerns that safety information might be used for enforcement purposes. Equally important is the need to encourage operators to report fully in order to build a reliable statistical data base. Education is the primary means of achieving this and is a major part of the CAA Safety Education Unit’s focus, through publications and seminars.

3. Since 2003, the CAA has run nine specific targeted industry seminars on the importance and methods of reporting occurrences. CAA also carries out a nationwide industry training programme of seminars (called AvKiwi Seminars) which targets general aviation commercial and private pilots and operators. Reporting of occurrences, the obligation to report and the means by which reports can be made, are topics in the seminars. The table below gives attendance information since 2004 for AvKiwi Seminars.

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4. The CAA publishes a bi-monthly industry safety magazine entitled Vector. As recently as May/June 2007, an article was published entitled Reporting Improves

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5 Vector has a print-run of approximately 15,000 copies and is distributed free of charge to all licence holders and other interested persons in the aviation sector.
Safety. The article focussed on the benefits of occurrence reporting and procedures to be used. Previous editions of Vector have included more specific articles: Report Instrument Defects in January/February 2005, Reporting Medical Conditions in July/August 2006, and Report Aircraft Defects in September/October 2006.

5. Standard items in every edition of Vector are coloured reminder notes providing the free-phone numbers for reporting Aviation Safety and Security Concerns – 0508 4 SAFETY (0508 472 338), and Accident Notification – 0508 ACCIDENT (0508 222 433). These contact numbers are also included on the title page in volumes 2, 3, and 4 of the Aeronautical Information Publication (AIP) New Zealand.

6. CAA also produces a series of information publications entitled How to, including How to Report Your Accidents and Incidents, last revised in 2002. It is widely distributed free of charge and is available from aero clubs and flying schools. The booklet’s availability is regularly advertised in Vector and copies are also provided on request to the CAA’s Communication and Safety Education Unit. It is also available on-line on the CAA’s web site http://www.caa.govt.nz/safety_info/How_tos/accidents.pdf.

CAA Conclusion

7. The CAA has implemented Coroner’s Recommendation 555.

Action Taken

8. The CAA will continue to take positive action on methods to increase awareness amongst the aviation community of the need to report occurrences under New Zealand Civil Aviation Rule Part 12 Accidents, Incidents and Statistics and the methods by which that can be done.
Coroner's Recommendation 557: Compulsory Reporting of Incidents

That the CAA, in conjunction with the Airways Corporation, consider the adequacy of compulsory reporting of certain categories of incident, including where safety has been apparently compromised by the actions of the pilot of an aircraft.

Evaluation Process

1. The CAA, in consultation with the Airways Corporation of New Zealand:
   - considered the effectiveness of the current New Zealand Civil Aviation Rules, specifically New Zealand Civil Aviation Rule 12.55 Notification of Incident; and
   - reviewed two specific occurrences involving Air Adventures to assess whether the occurrences should have been reported.

Information Considered

2. The CAA examined the current New Zealand Civil Aviation Rule that requires incident notification. Rule 12.55 Notification of Incident requires that an incident be notified if it is serious or if there is an immediate hazard to the safety of an aircraft operation.

3. In consultation with Airways Corporation of New Zealand, the CAA closely examined two occurrences to determine if the cases ought to have been reported to the CAA. The occurrences related to:
   - an incident that occurred in April 2002 in the vicinity of Dunedin Airport; and
   - an incident that related to an overdue aircraft at Queenstown Airport.

4. The Dunedin incident involved a flight to Dunedin in poor weather, including rain and limited visibility. The pilot carried out a non-standard missed approach and there was subsequent discussion between the pilot and the tower controller, although no formal report was filed. In the opinion of the controller there was insufficient justification for a formal incident report. With only anecdotal and hearsay information, subsequent assessment of this occurrence could not establish whether there was any actual hazard to aircraft safety.

5. The Queenstown Airport incident involved an overdue flight at Queenstown Airport where the pilot had decided to land at a destination other than that originally planned and had terminated his flight plan late. Under New Zealand Civil Aviation Rule Part 12 Accidents, Incidents and Statistics, late termination of a flight plan is not reportable, nor is it a safety issue per se. Search and rescue activity is automatically triggered at the elapse of the specified time that arrival is due. Of course late termination can create considerable and unnecessary concern, effort and cost for the search and rescue organisation. For this reason, both CAA and Airways Corporation of New Zealand go to significant lengths to encourage on-time cancellation of flight plans and ‘Search and Rescue Watch’ (SARWatch).  

6 A pilot-nominated time after which search and rescue action will be initiated.
CAA Conclusion
6. CAA has concluded, after consultation with Airways Corporation of New Zealand, that existing rules for incident notification are effective and that the two specific occurrences identified did not suggest need for amendment.

Action Taken
7. The CAA will be taking no further action with respect to Coroner’s Recommendation 557.

That the CAA urgently reviews and upgrades single-pilot Instrument Flight Rules training and testing requirements, including night flying and flying in adverse meteorological conditions.

Evaluation Process

1. CAA considered the practices of other relevant International Civil Aviation Organisation member states and weather conditions associated with comparable rules in those states.

Information Considered

2. A comparison of New Zealand’s minimum flight experience requirements for pilots of small aeroplanes in commercial air operations7 with those of the US Federal Aviation Administration and the Civil Aviation Safety Authority of Australia shows that the New Zealand requirements are less rigorous.

3. Accordingly, CAA has reviewed Pilot In Command requirements for New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes with the aim of raising the minimum level of flight experience and to make it more relevant to the particular operation the pilot is conducting, for example single-pilot Instrument Flight Rules.

4. It should be noted that, in the context of the Coroner’s recommendation, there is little difference between the terms “flying in adverse meteorological conditions” (as the Coroner put it) and Instrument Flight Rules and/or night operations (more commonly used aviation terminology). The two are more or less synonymous, illustrated by the example that an Instrument Flight Rules approach in unfavourable weather may be easier at night than during the day because there is an enhanced ability to see aerodrome approach lights.

CAA Conclusion

5. The CAA determined that the existing rules could be improved by raising the requirements for single-pilot Instrument Flight Rules and night operations.

Action Taken

6. The CAA has upgraded training requirements for single-pilot Instrument Flight Rules and night operations by proposing amendments to New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes that will significantly raise experience levels for Instrument Flight Rules pilots and require a further 40 hours of supervised consolidation flight time during air operations for single-pilot night and Instrument Flight Rules pilots. The 40 hours flight time will include:

7 New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes
• for air operations under Instrument Flight Rules, a minimum of 10 hours flight time on air operations conducted under Instrument Flight Rules; or

• for air operations under Visual Flight Rules at night, a minimum of 10 take offs and landings at night.

7. Proposed amendments to New Zealand Civil Aviation Rule Part135 *Air Operations – Helicopters and Small Aeroplanes* have been completed by the CAA\(^8\) and have been forwarded to the Ministry of Transport for signature by the Minister.

8. Instrument Flight Rules and night flight testing and flight examination requirements are currently being reviewed as part of a major review of New Zealand Civil Aviation Rule Part 61 *Pilot Licences and Ratings*.\(^9\)

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\(^8\) Rules Project Docket 6/CAR/3 *Experience Levels*

\(^9\) Rules Project Docket 4/CAR/4 *Part 61 Review – Stage 2*
Coroner's Recommendation 561: Use of Auto-Pilots on Instrument Approaches

That the CAA considers the adequacy of New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience in relation to instrument approaches and the use of auto-pilots.

Evaluation Process

1. The CAA reviewed New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience.

Information Considered

2. The CAA reviewed New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience in the context of the Coroner’s remark (paragraph 560) that “While Mr Bannerman appears to have complied as at 6 June 2003 with Rule 61.37 (c) by carrying out not less than three take offs and three landings by night in the preceding 90 days, these do not appear to have been instrument approaches”.

3. New Zealand Civil Aviation Rule 91.301 VFR Meteorological Minima permits night flight under Visual Flight Rules when the relevant meteorological minima are met and, by definition, instrument flight is not required in this circumstance. New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience is a long-established general rule intended to require recent experience of night flight, particularly takeoffs and landings, irrespective of whether the operation is under Visual Flight Rules or Instrument Flight Rules.

4. Accordingly, it is considered that New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience is adequate for its intended purpose of requiring recent experience of night flight when operation at night is envisaged. It is not relevant to link this rule with instrument approaches and the use of auto-pilot.

5. However, it is relevant to note under this Recommendation that a comprehensive Advisory Circular has been developed by CAA to give practical advice to pilots on single-pilot Instrument Flight Rules procedures, including normal operating and emergency procedures, use of check lists, flight planning, aircraft preparation and operations, operating techniques and any other appropriate detail that will improve safety and reduce risk. Advisory Circular 91-11 Single Pilot Instrument Flight Rules published in February 2006 advocates use of the auto-pilot as much as possible to minimise cockpit workload.

6. Instrument approaches and the use of auto-pilot are covered in other rules and are also considered under Recommendation 564.

CAA Conclusion

7. The CAA has concluded that New Zealand Civil Aviation Rule 61.37 (c) Recent Flight Experience is adequate for its intended purpose of ensuring recent experience of night flight when operation at night is envisaged and that it is inappropriate to link the rule with instrument approaches and the use of auto-pilot.
Action Taken

8. CAA will be taking no further action with respect to Coroner’s Recommendation 561.
Coroner’s Recommendation 564: Requirements and Best Practice for Single-Pilot Instrument Flight Rules

That the CAA urgently review single-pilot Instrument Flight Rule processes, requirements and best practice, including the use of coupled approaches and identification of and assistance for pilots who demonstrate any difficulty in Instrument Flight Rule procedures.

Evaluation Process

1. The CAA reviewed New Zealand Civil Aviation Rules Parts 61.37 (c) and 61.807.

Information Considered


3. As noted above in Recommendation 561, AC91-11 Single Pilot Instrument Flight Rules has been developed by CAA to give highly practical advice to pilots on single-pilot Instrument Flight Rules procedures, including normal operating and emergency procedures, use of check lists, flight planning, aircraft preparation and operations, operating techniques and any other appropriate detail that will improve safety and reduce risk.

4. The Advisory Circular, published in February 2006, advocates use of the auto-pilot as much as possible to minimise cockpit workload. It notes that it is well established that putting the pilot in a monitoring role (rather than a controlling one) makes detection of flight deviations easier to accomplish. Auto-pilot use (in coupled approaches) allows the pilot to maintain an overview of the flight and its progress, rather than simply carrying out the immediate requirements of maintaining control when ‘hand flying’ the aircraft. The pilot’s ability to monitor flight progress is improved when using the auto-pilot as he/she has more opportunity to complete required cockpit tasks including checklists, obtaining weather forecasts, checking fuel status, tuning navigation aids, confirming electronic database details against hard copy and preparing for an instrument approach.

5. Consideration was given to the Coroner’s recommendation to review “identification of and assistance for pilots who demonstrate any difficulty in Instrument Flight Rule procedures”. It was concluded that this is already precisely the purpose of the flight training system in New Zealand. The flight training system has the following elements:

- a comprehensive and complementary set of New Zealand Civil Aviation Rules, Advisory Circulars and Flight Test Standards guides developed over time by experts in the light of experience;

- the flight training and checking infrastructure provided by the aviation industry; and
• holders of Flight Examiner Ratings for conducting flight tests and operational competency assessments.

6. In order to reduce Flight Examiner subjectivity as far as is practicable, flight tests are standards-based. The candidate will not be issued with the relevant aviation document unless the task competencies defined in the Flight Test Standards Guides are achieved at the time of assessment. Failure to demonstrate competence in any item of the test will generally result in the applicant and the instructor being advised of failure aspects and further training believed necessary before a further flight test may be undertaken.

7. Having achieved the defined standard on the day of assessment, a pilot’s ongoing performance will inevitably depend on such factors as accumulated experience on the aircraft type and nature of operation, currency, preceding duty and rest time, medical fitness, and general mental attitude towards risk taking and decision making in the face of a variety of operational pressures. These factors are likely to have just as much influence on flight safety as the passing of a routine competency test. All but the last of these factors are covered by New Zealand Civil Aviation Rules. Mental attitude toward risk taking and decision making is more difficult to manage. This is discussed under Recommendation 581.

8. The CAA will, however, consider whether New Zealand Civil Aviation Rule 61.807 Currency Requirements should be amended to specify that, for single-pilot operations, the required currency should be established in the single-pilot role.10

9. Additionally, CAA has completed a review of the minimum flight experience requirements for pilots of small aeroplanes in commercial air operations11 with the aim of raising the minimum level of flight experience and to make it more relevant to the particular operation the pilot is conducting, e.g., single-pilot Instrument Flight Rules.12 The final rule has been forwarded to the Ministry of Transport for signature by the Minister.

CAA Conclusion
10. The CAA agrees with Coroner’s Recommendation 564 to review single-pilot Instrument Flight Rules processes, requirements and best practice, including the use of coupled approaches.

11. With regard to identification of and assistance for pilots who demonstrate difficulty in Instrument Flight Rules procedures, CAA concluded that this purpose is already precisely addressed by the New Zealand flight training system.

Action Taken
12. The CAA has taken the following action with regard to Coroner’s Recommendation 564:

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10 Rules Issue 8/ISS/1 Single Pilot Instrument Flight Rules Currency

11 New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes

12 Rules Project Docket 6/CAR/3 Experience Levels
• Published Advisory Circular 91-11, *Single Pilot Instrument Flight Rules*, dated 28 February 2006 which:
  o recommends good practice for safe single-pilot Instrument Flight Rules operations, and
  o provides practical advice to pilots on the use of auto-pilot to minimise cockpit workloads.

• Is currently reviewing whether New Zealand Civil Aviation Rule 61.807 *Currency Requirements* should be amended to specify that, for single-pilot operations, the required currency should be established in the single-pilot role.\(^\text{13}\)

• Has upgraded minimum flight experience and training requirements for pilots of small aeroplanes in commercial air operations\(^\text{14}\) to make those aspects more relevant to the particular operation the pilot is conducting, for example single-pilot Instrument Flight Rules.

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\(^\text{13}\) Rules Issue 8/ISS/1 *Single Pilot Instrument Flight Rules Currency*

\(^\text{14}\) New Zealand Civil Aviation Rule Part 135 *Air Operations – Helicopters and Small Aeroplanes*
Coroner’s Recommendation 567: Rules for Non-Certificated Global Positioning Systems

That the CAA review the adequacy of rules for non-certified Global Positioning Systems in relation to instrument landings, to ensure a pilot-in-command cannot use the Global Positioning Systems system in instrument approaches, and consider amending the rules to require non-certified Global Positioning Systems to be disengaged before a pilot commences an instrument approach.

Evaluation Process

1. The CAA reviewed the rules regulating the use of non-certificated Global Positioning Systems in relation to instrument landings in the context of the Coroner’s Recommendation.

Information Considered

2. The CAA considered:

   • specific information about Global Positioning System (e.g., way points, data storage, etc);
   • conditions for use specified in the relevant rules; and
   • educational activity used to inform pilots of their obligations.

3. The rules for the use of Global Positioning System equipment in Instrument Flight Rules operations are clearly set out in New Zealand Civil Aviation Rule Part 19 Transition Rules, Subpart D IFR Operations: Global Navigation Satellite System. In particular, a Global Positioning System that is not approved for use as a primary or sole means of navigation system may be used only for providing supplementary information. CAA considers that these instruments, even if not approved, can assist in reducing cockpit work load, while at the same time helping to maintain situational awareness. Their use is not discouraged, provided the more traditional terrestrial navigation aids\(^{15}\) are relied upon for critical Instrument Flight Rules navigation. The CAA also supports the rules with ongoing safety education of pilots.\(^{16}\)

4. The Coroner observed at Paragraph 566 that “The temptation would be to have regard to the Global Position Systems instrument. The evidence shows it is likely he had some regard to the Global Position Systems during the instrument approach.”

5. Witnesses at the inquest speculated that the pilot may have been using the aerodrome reference point as the destination waypoint, rather than the coordinates of the Visual Omni Range/Distance Measuring Equipment. This led to the conclusion that the pilot was likely to have had some regard to the Global Positioning Systems, with the implication that it was a factor in the accident. However, the Garmin Global

\(^{15}\) Visual Omni Range (VOR) Distance Measuring Equipment (DME) Instrument Landing System (ILS)

Positioning Systems III is a small hand-held type device with relatively small grey-scale alphanumeric digits and only gentle backlighting. It seems unlikely that the pilot would have used this in preference to the comparatively large and bright Distance Measuring Equipment instrument, particularly at night. In any event, the Christchurch destination waypoint stored in the Global Positioning System was for the Christchurch Visual Omni Range/Distance Measuring Equipment and so, notwithstanding the absence of Global Positioning System certification, it is likely that the two instruments would have given the same distance to run.

**CAA Conclusion**

6. CAA has reviewed the adequacy of rules for non-certificated Global Positioning Systems in relation to instrument landings. It is concluded that the rules are adequate and already prohibit the use of non-certificated Global Positioning Systems equipment on instrument approaches.

**Action Taken**

7. The CAA will be taking no further action with respect to Coroner’s Recommendation 567.
Coroner’s Recommendation 578: Mechanisms for Passenger Complaint

That there is a mandatory requirement for a mechanism of passenger complaint for passengers on commercial flights in the General Aviation sector.

Evaluation Process
1. The CAA reviewed existing mechanisms for passengers on commercial flights in the General Aviation sector to make complaints.

Information Considered
2. The CAA reviewed:
   • information detailed on flight safety cards;
   • calls received on its free phone service (0508 4 SAFETY); and
   • the CAA web site.

CAA Conclusion
3. The CAA concluded that:
   • the existing systems and mechanisms available to passengers on commercial flights in the General Aviation sector provide a mechanism for complaints;
   • complaints are made by passengers when they are aware of potential risks, issues, or concerns;
   • existing systems could be made easier for passengers to access and understand; and
   • the CAA web-site could be more user friendly.

Action Taken
4. The CAA agrees with this recommendation and will commence rule making action to make the use of passenger safety briefing cards mandatory on commercial transport operations under New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes, with a requirement for such cards to indicate an avenue for complaint direct to the CAA regarding any safety concerns.\(^\text{17}\) In addition, the CAA will investigate ways to bring to the attention of the travelling public the existence of the 0508 4 SAFETY telephone number.

5. The CAA has substantially revised and upgraded its web-site to make it easier to use and navigate.

\(^{17}\) Rules Issue Number 8/ISS/2 Mechanism for Passenger Complaint
Coroner's Recommendation 581: Mandatory Reporting of Colleagues

That the CAA give close consideration to Dr Sharples’ submissions and sources in considering outcomes from this inquest with particular reference to mandatory reporting of colleagues where aviation practice falls below acceptable professional standards.

Evaluation Process
1. The CAA has considered Dr Sharples’ submission in the context of existing CAA surveillance policy.

Information Considered
2. The aviation industry, in particular the airline sector, has adopted a ‘just culture’ approach to safety management. Most major airlines have in place a mandatory reporting system for their employees.
3. Accordingly, the CAA considered:
   - existing industry practice;
   - its (CAA) internal organisation, given its regulatory functions and statutory mandate, in particular its own use of data and information; and
   - the requirements of the Health Practitioners Competency Act 2003.

CAA Conclusion
4. The CAA concluded that:
   - mechanisms are already in place that enable industry participants to report to the CAA safety concerns or risks regarding the performance and practice of other participants;
   - that a key issue is the way in which the CAA uses the information reported to it; and
   - that the policies used by the CAA to govern how data and information is used by it needed to be revised.

Action Taken
5. The CAA has:
   - reviewed and revised policies used to govern the use of data and information reported to it by industry participants;
   - revised and reissued CAA Surveillance Policy on 8 December 2006; and
   - restructured part of its internal organisation to enable more effective and more transparent relationships between its investigatory and safety information functions.
by creating a Safety Information Group headed by a General Manager, effective from 16 July 2007.
**Coroner's Recommendation 582: Deviation from Civil Aviation Rules**

That the CAA adopts a lower threshold than was apparent from the evidence at this inquest with respect to the activities of Air Adventures and Mr Bannerman, to toleration of deviation from the New Zealand Civil Aviation Rules that affect the safety of passengers.

**Evaluation Process**

1. The CAA reviewed its Surveillance Policy to determine whether it provides clarity about the use of available regulatory tools and the circumstances in which they might be applied.

**Information Considered**

2. The CAA Surveillance Policy was reviewed and reissued on 8 December 2006 and addresses the use of the regulatory tools available to enforce compliance with the Civil Aviation Act and rules. The CAA has a range of regulatory tools available to deal with ‘deviation from the rules’. It is important to ensure that staff members are fully aware of the policy and have clear guidance in identifying the tools to be used. The CAA agrees that the ‘threshold’ referred to by the Coroner must be clearly understood and implemented by all CAA staff.

3. Section 9(2) of the CAA Surveillance Policy provides as follows:

   “The Director uses the available regulatory tools to mitigate safety risk. For this risk mitigation to be effective, the correct tool(s) must be applied in the particular circumstances of each case in question. The graduated use of the CAA regulatory tools enables the statutory powers granted to the Director under the Act to be used appropriately in a reasonable, fair, and just manner.

   It is important that decisions concerning the use of regulatory tools be made on a principled basis and that those principles are public knowledge. These guidelines indicate, in a general way, the basis upon which decisions concerning the exercise of the Director’s powers with respect to the choice and application of regulatory tools will be made. They provide guidance to CAA staff who have to make (or recommend) decisions concerning the choice and application of the tools and they provide participants in the civil aviation system and other interested parties with information on the factors the CAA takes into consideration when deciding whether to apply the regulatory tools and/or which tool to apply.

   When making decisions in respect of any particular case, the Director or CAA staff members exercising a delegated power, must consider the circumstances that apply to that particular case and have discretion, within the scope of their powers, to take whatever action is considered appropriate. While that discretion must not be fettered, there are a number of factors that should normally be considered by the decision-maker when they are exercising discretion and it is important to promote consistency in decision making. Thus, while there is no place for rigid rules dictating how discretion is to be exercised, these guidelines enhance consistency while providing sufficient flexibility for each decision to be made on its own merits.”
CAA Conclusion

4. The CAA agrees that the threshold referred to by the Coroner must be clearly recognised by all CAA staff and that it is necessary to ensure that staff are fully aware of its Surveillance Policy and have clear guidance in identifying the regulatory tools to be used.

Action Taken

5. The CAA Surveillance Policy was reviewed and reissued on 8 December 2006 and addresses the use of the regulatory tools available to enforce compliance with the Civil Aviation Act and rules. Through the use of improved induction and recurrency training CAA will ensure that staff are fully aware of its Surveillance Policy and have clear guidance in identifying the regulatory tools to be used.
Coroner's Recommendation 583: ‘Demerit Points’ System

That consideration be given to the CAA rules being amended with respect to General Aviation operators and pilots operating in the General Aviation sector, to introduce a system of ‘demerit points’ to take account, on a cumulative basis (with appropriate time limitation periods) of any history of non-compliance with the rules by the operator or, as the case may be, the pilot.

Evaluation Process

1. The CAA reviewed the provisions in the Civil Aviation Act, in particular the provisions of section 10 of the Act.

Information Considered

2. The CAA considered:

   • the relationship between the New Zealand Civil Aviation Rules and infringement offences as specified in Regulations, as well as the relationship of these items to the Civil Aviation Act;

   • the Civil Aviation Safety Authority of Australia ‘demerit points’ scheme and its effectiveness; and

   • the probable volume of offences that would be generated by implementation of the Coroner's recommendation (estimated to be approximately 20 per annum, based on the Australian experience to date).

3. Sections 57 and 58 of the Civil Aviation Act 1990 provide for infringement offences specified in the Civil Aviation (Offences) Regulations 1997. There have been delays in developing the processes required to implement an infringement offence system, principally because the offences regulations have generally not kept pace with New Zealand Civil Aviation Rules development.

4. However, following a comprehensive review and update of the offence regulations which came into force in August 2006, the CAA has advised the aviation community that Infringement Notices will now be used as an alternative enforcement tool to the written warnings and prosecutions that have been used in the past. It is likely that rule breaches regarded as falling near the more serious end of the written warning spectrum and the less serious end of the summary prosecutions will, in future, be dealt with by the infringement process. The highest infringement fee is $2,000 for an individual or $12,000 for a body corporate.

5. The accumulation of multiple offences (both summary and infringement) by an individual or a body corporate will have the potential to trigger CAA action under sections 15-19 of the Civil Aviation Act 1990. In the case of an operator, each offence

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18 Civil Aviation (Offences) Regulations 1997. A comprehensive review and update of Schedule 1 to the Civil Aviation (Offences) Regulations came into force on 1 August 2006.

will also count adversely in the CAA’s internally maintained individual Risk Profile for aviation participants.

6. The CAA notes that the Civil Aviation Safety Authority of Australia instituted a ‘demerit points scheme’ in February 2004.20 The scheme operates as an adjunct to its Infringement Notice scheme, with participants incurring demerit points in relation to prescribed offences. The number of demerit points incurred is determined by the severity of the offence, with the accumulation of too many points resulting in automatic suspension of the relevant licence or certificate for up to 150 days. Demerit points are incurred over a three-year rolling period. Extreme cases result in automatic cancellation of the licence, with no entitlement for a further grant of a licence of that type for three years. It appears that about four or five infringements have to be accumulated in three years before automatic suspension is triggered.

7. In its 2004-2005 Annual Report, the Civil Aviation Safety Authority of Australia noted that 79 Infringement Notices were issued, five licences/certificates were suspended and 13 were cancelled during the period, although there is no indication that the suspensions and cancellations were in fact triggered by the demerit points scheme. The New Zealand General Aviation sector is less than 30 per cent of the size of Australia’s and so, on a pro-rata basis, the CAA might expect to issue no more than about 20 Infringement Notices per annum.

8. The CAA considers that the setting up and running of a ‘demerit points’ scheme similar to that instituted by Civil Aviation Safety Authority of Australia would be relatively straightforward, given the sophistication of the CAA database. However, as in Australia, it is likely that significant legislation changes rather than rule changes would be required. It is debatable whether this would be warranted in the light of the existing tools available and the very low volume of actions likely under such a scheme.

**CAA Conclusion**

9. The CAA concluded that:

- the Act provides tools that enable the Director of Civil Aviation to assess the fit and proper person status of participants in the civil aviation sector;
- in discharging his obligations under the Act with respect to fit and proper person status, the Director can and does take account of an operator’s or individual’s record of performance;
- the number of participants that would acquire ‘demerit points’ is likely to be relatively low;
- a change to the Act would be required to introduce a demerit point system; and
- changing the Act to enable demerit points, given its existing provisions, is not warranted and is unlikely to provide a deterrent effect given the probable volume of demerit point holders.

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20 Division 13.K.2 of the Civil Aviation Safety Regulations 1998 (CASR)
Action Taken

10. The CAA will be taking no further action with respect to Coroner’s Recommendation 583.
Coroner’s Recommendation 586: Safety Record of Operators

That the CAA gives consideration to implementing a system whereby consumers can gauge the safety record of an operator.

Evaluation Process

1. The CAA considers that the Recommendation should be subject to further policy evaluation before such a system could be implemented.

Information Considered

2. The CAA has referred the following recommendations to its internal Policy and International Unit for consideration, in particular:
   - the implementation of a system whereby consumers can gauge the safety record of an operator; and
   - that an amendment should be sought to the Civil Aviation Act to facilitate the implementation of an Operator Safety Rating System.

3. As an interim measure, the CAA will develop an information package for the public that highlights the different levels of safety associated with various types of air operation and, in particular, explaining why safety levels vary across the industry. The information provided will highlight the safety targets and safety performance for different groups. The package will also address such issues as certification standards for organisations,21 airworthiness/certification standards for aircraft, requirements with regard to one or two-pilot numbers and qualifications and single-pilot versus multi-pilot accident rates.

CAA Conclusion

4. The CAA agrees with Coroner’s Recommendation 586, to give consideration to implementing a system whereby consumers can gauge the safety record of an operator. In particular, that:
   - additional information could be provided to the public that outlines safety issues and risks associated with differing types of aviation activity (e.g., first and second level airline operations, small airline and charter operations and adventure aviation);
   - information could be provided on safety performance, viz., Aviation Safety Target Outcome Groups; and
   - subject to completion of the relevant policy analysis, an amendment could be sought to the Civil Aviation Act to enable an Operator Safety Rating System to be introduced.

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21 New Zealand Civil Aviation Rule Part 121 Air Operations – Large Aeroplanes, Part 125 Air Operations – Medium Aeroplanes and Part 135 Air Operations – Helicopters and Small Aeroplanes
Action Taken

5. The CAA will:

- undertake policy consideration, in the CAA Business Plan 2008-2009 or before, of the development of an Operator Safety Rating System to assist in providing information to the public on the safety performance of individual operators; and

- develop, in the CAA Business Plan 2008-2009 or before, an information pack for the public that outlines the safety issues and risks associated with differing types of aviation activity.
Coroner’s Recommendation 590: Two-Pilot Operations

That the CAA strengthens the criteria for requiring dual pilots for flights with fee paying passengers.

Evaluation Process

1. The CAA evaluated the current requirements for flight crewing, the safety risks associated with different types of operation and the practical issues that arise from the Coroner’s recommendation with respect to safety risks.

Information Considered

2. The CAA noted the comment recorded by the Coroner that “there was not a co-pilot on this flight which could have made all the difference in the circumstances”.

3. The CAA agrees that having a co-pilot on board may be beneficial, but only if the standard operating procedures are designed for two-pilot operation in terms of a clear delineation of roles and responsibilities from pre-flight through to post-flight and if the pilots are trained in their use. It is not simply a matter of having two-pilot standard operating procedures and a second pilot on board; both pilots must be trained and checked in two-pilot operations because they are distinctly different from single-pilot operations. In a 2004 amendment to New Zealand Civil Aviation Rule 135.511 Minimum Flight Crew – IFR an additional paragraph (b) was added that disallows two-pilot operations “unless the functions of each pilot relating to the operation and safety of the air operation are assigned in writing by the certificate holder, and the aircraft is equipped with ... certain instruments and controls.”

4. Moreover, a requirement for two pilots would not be advisable for aircraft that are designed for single-pilot operation only. Two-pilot operation would not be viable for smaller aircraft. Mandating it for Instrument Flight Rules operations may be counterproductive in terms of safety because it may lead to some operators changing from Instrument Flight Rules to Visual Flight Rules. History suggests that pilots constrained to Visual Flight Rules will sooner or later be faced with the temptation to fly at low levels in marginal weather conditions in order to complete an obligation and this can lead to extremely high risk.

5. However, CAA strongly encourages two-pilot operation where the appropriate standard operating procedures are employed. Most operators accept there is a safety benefit in doing so.

6. Current New Zealand Civil Aviation Rule 135.511 Minimum Flight Crew – IFR allows single-pilot Instrument Flight Rules, provided this is permitted by the aircraft flight manual and the aircraft is equipped with an operative auto-pilot providing automatic heading and altitude hold. There is currently no requirement for coupling to approach aids. In this respect New Zealand is in conformance with International Civil Aviation Organisation and Joint Aviation Requirements applicable to aircraft configured with nine passenger seats or less.
CAA Conclusion

7. The CAA concluded that:

- New Zealand is in conformance with international practice with respect to instrument and flight equipment (e.g., an auto-pilot that has automatic heading and altitude hold) for aircraft with nine passenger seats or less.
- there are situations where having a pilot and co-pilot on board is beneficial;
- the standard operating procedures used by an operator need to properly reflect the different disciplines of single and two-pilot operations;
- for a number of General Aviation operators, it is common to switch between single and two-pilot operations, for an individual aircraft, from time to time to meeting changing operational circumstances;
- mandating the use of two-pilot operations increases the risk of operators moving from Instrument Flight Rules to Visual Flight Rules operations, thereby increasing safety risks in some situations;
- increased use of Visual Flight Rules may lead to pilots flying in marginal conditions, increasing safety risk;
- most operators understand and accept the benefits of two-pilot operations; and
- existing New Zealand Civil Aviation Rules place stringent requirements on the way in which the functions of two-pilot operations must be assigned in writing by the certificate holder in its standard operating procedures and for the aircraft to be equipped appropriately with respect to controls and instrumentation.

Action Taken

8. The CAA will be taking no further action with respect to Coroner’s Recommendation 590.
Coroner’s Recommendation 595: Pilot Records for Flight Examiners

The Civil Aviation Act and/or the New Zealand Civil Aviation Rules be amended to allow for all Occurrence Reports, Aviation Related Concerns and safety information relevant to a pilot and/or operator, to be made available to the Flight Examiner of that pilot or any instructor conducting type rating training carrying out competency checks.

Evaluation Process

1. The CAA reviewed the existing New Zealand flight training system and processes for carrying out competency checks, including issues of consistency across Flight Examiners and Instructors, and the effectiveness of guidance information provided to Flight Instructors and Examiners.

Information Considered

2. In the New Zealand aviation training system, flight tests and pilot competency checks are ‘standards-based’ objective measures of competency. The CAA is aware of the consequent need for standardisation among those conducting such examinations and has issued a range of Flight Test Standards Guides in order to reduce Flight Examiner or Instructor subjectivity as far as is practicable.

3. CAA also conducts seminars for Flight Examiners and Flight Instructors, both combined and separately, on a biennial basis. In 2003 a combined seminar was held attended by 174 flight instructors, of which 10 were also Flight Examiners. In 2005 120 flight instructors attended of which 23 were also Flight Examiners; and in 2007 141 Flight Instructors attended of which 21 were also Flight Examiners. In addition, a specialist Examiner seminar was held in 2005 attended by 65 Flight Examiners. There will be a further specialist Examiner seminar in 2008 and the intention is to continue the two types of seminar biennially, on alternate years.

4. In order to inform its own decision-making on this issue, the CAA sought comment on various issues from Flight Examiners on Recommendation 595. The opinions expressed in the responses varied. An analysis of the responses indicated a general consensus among the Flight Examiners that:

   • there would be little safety benefit as the practice could be counterproductive by inhibiting occurrence reporting;

   • information would not be relevant in a standards-based assessment and would make it harder to maintain objectivity;

   • there would be a risk of predetermination of pilot ability and/or a negative change in the examiner/pilot relationship;

   • privacy concerns could arise;

   • it is not the Flight Examiner’s role to make subjective judgements not based on the candidate’s performance during the test; and
• there would be practical difficulties in accessing the data and in training for its use.

5. The survey return rate was 15 per cent and the results generally supported the CAA view that the Flight Examiner’s or Instructor’s role is to apply objective competency standards, the setting of which should not be influenced by prior performance. There is a fundamental conflict between the recommendation and the principles of standards-based assessment of competency. In addition, the recommendation is likely to provide little safety benefit, may pose a risk to voluntary occurrence reporting, increase the variation in testing standards, increase the risk of predetermination and present practical implementation difficulties.

CAA Conclusion

6. The Flight Examiner’s role is to apply objective competency standards, the outcome of which should not be influenced by prior concerns. The CAA survey of practicing Flight Examiners revealed little support for the recommendation on the grounds of safety benefit, attendant risks to voluntary occurrence reporting, reduced objectivity, predetermination, privacy concerns and practical implementation difficulties.

Action Taken

7. The CAA accepts the consensus of responding Flight Examiner views and therefore does not intend to adopt Coroner’s Recommendation 595.

8. However, the CAA:

• has significantly upgraded and reissued, in May 2006, a comprehensive set of Flight Test Standards Guides covering the entire range of pilot competencies;

• will continue to conduct the successful and well received specialist Flight Instructor and Flight Examiner seminars, biennially on alternate years, the focus of which is on how to apply competencies and standards in assessing an individual pilot’s ability; and

• will introduce a requirement for formal training of Flight Examiners in Phase Two of the current re-write of New Zealand Civil Aviation Rule Part 61 Pilot Licences and Ratings.
Coroner's Recommendation 598: Monitoring of Individual Pilots

That the CAA implements a process of monitoring the individual pilot, separate from monitoring the operator, from a competency and safety perspective.

Evaluation Process

1. The CAA assessed this recommendation in the context of the Civil Aviation Act and associated Rules.

Information Considered

2. In the Air Adventures accident the pilot was, effectively, the operator. Under sections 12 (3) and 12 (4) of the Civil Aviation Act the operator is primarily accountable for compliance. The CAA believes that such accountability is entirely appropriate given that pilot behaviour is strongly influenced by environmental factors such as the operator’s procedures, training provided and incentives for healthy behaviour. There would be little value in holding the pilot solely responsible for New Zealand Civil Aviation Rules non-compliances instead of the operator, because that would tend to absolve the operator from active management of pilot behaviour through continuous improvements to the environmental factors mentioned above.

3. The CAA also noted the Coroner’s comment, at paragraph 597, that the Civil Aviation system is “not able to intervene in processes that might make a pilot a better pilot”.

4. In response to this comment, the CAA extracted from its database a list of all active pilots with four or more associated safety occurrences since 1970 to see if this might reveal individuals warranting specific attention. The database query produced a list of about 300 pilots associated with about 1500 occurrences. However, about 75 per cent of these were incidents reported by the pilot concerned and indicated little or no culpability on their behalf. About 20 per cent of these pilots were involved in accidents, but in almost all cases these involved agricultural spraying or topdressing, shooting and wild animal recovery using helicopters, other aerial work (usually with helicopters), private or sport and recreation operations, or were accidents initiated by aircraft defects. There were 31 Aviation Related Concerns, associated with only seven pilots, five of whom had already been the subject of CAA law enforcement action triggered by those concerns.

CAA Conclusion

5. The CAA database of compulsorily reportable occurrences already allows monitoring of pilots but analysis shows that, in the case of operations involving fare-paying passengers, this is unlikely to reveal the need to take action against a pilot. When specific concerns about a pilot’s behaviour are registered with the CAA, the system has been shown to be responsive.

6. CAA will, however, undertake further policy work on the safety benefits of monitoring individual pilots in addition to the monitoring of operators and/or organisations.
**Action Taken**

7. The CAA will undertake further policy work on the safety benefits of monitoring individual pilots in addition to the monitoring of operators and/or organisations.
Coroner's Recommendation 600: Independent Verification of Flight Test Results

To monitor more effectively, the safety of the General Aviation sector, that the CAA obtains independent verification of all flight test results as they happen.

Evaluation Process

1. The CAA assessed the recommendation in accordance with the division of responsibilities specified in the Civil Aviation Act, under which the Director monitors the exercise of the privileges and responsibilities of flight examiners.

Information Considered

2. The CAA noted the Coroner’s observation at Paragraph 599 that “the organisation carrying out the flight test is not required to provide the regulator with assessment records for pilot competency”.

3. A high proportion of pilot assessments do come to CAA to enable licence or rating issue and updating of the pilot database. These include renewal of instrument ratings but not New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes competency checks. However, the latter are subject to audit as part of CAA routine surveillance activity of New Zealand Civil Aviation Rule Part 119 Air Operator – Certification operations. Similarly, pilot training records will be subject to audit when the New Zealand Civil Aviation Rules are amended to require all flight training and assessment for a pilot licence or rating to be conducted by training organisations certificated under New Zealand Civil Aviation Rule Part 141 Aviation Training Organisations – Certification.22

4. A recent amendment to New Zealand Civil Aviation Rule Part 61 Pilot Licences and Ratings has resulted in CAA now receiving copies of all Biennial Flight Reviews. The CAA uses this information to monitor Flight Instructors’ performance.

5. The concept of ‘independent’ verification of flight test results implies an independent Flight Examiner either being present during the actual test or a further test being conducted subsequently by an independent Flight Examiner. The former would not be practicable and the latter would be unfair to the candidate unless everyone was subjected to it, in which case it would be prohibitively time consuming and expensive. The concept implies some concern about variation between Flight Examiners in terms of ability and this is discussed under Recommendation 602.

CAA Conclusion

6. The CAA concluded that existing regulatory tools for monitoring the performance of Flight Examiners/Instructors are satisfactory because flight tests are standards-based. Objectively assessed independent verification would have little or no value and significant administrative difficulties and cost would be introduced.

22 Amendment to Civil Aviation Rule Part 141 Aviation Training Organisations – Certification to be introduced mid-2008
**Action Taken**

7. The CAA will take no further action with respect to Coroner’s Recommendation 600.
Coroner’s Recommendation 602: Flight Crew Competency Checks

That the CAA takes steps to encourage, where possible, Flight Crew Competency Checks for an individual pilot over a period, to be carried out by different Flight Examiners/Instructors.

Evaluation Process
1. The CAA assessed current systems for Flight Crew Competency Checks and sought comment from practising Flight Examiners on the benefits and usefulness, or otherwise, of requiring tests to be performed by different Flight Examiners.

Information Considered
2. In order to inform its own decision-making on this issue, the CAA sought comment on various issues from Flight Examiners on Recommendation 602. An analysis of the responses indicated a general consensus among the Flight Examiners that:
   - safety benefits of such a change would be marginal;
   - in many instances there would be problems associated with availability of examiners when needed, and loss of beneficial rapport; and
   - there would be practical implementation issues and costs would rise.
3. As noted in the CAA response to Recommendation 595, the CAA is aware of the need for standardisation among Flight Examiners and has issued a very comprehensive set of Flight Test Standards Guides in order to reduce subjectivity as far as is practicable.
4. CAA also conducts very successful Flight Examiner/Instructor seminars on a biennial basis. In 2003 174 flight instructors attended of which 10 were also Flight Examiners. In 2005, 120 flight instructors attended of which 23 were also Flight Examiners and in 2007, 141 Flight Instructors attended of which 21 were also Flight Examiners.

CAA Conclusion
5. The CAA concluded that the steps taken to provide additional flight test information to Flight Examiners and Flight Instructors and to improve standardisation by regular instructor/examiner seminars address the issue identified in Coroner’s Recommendation 602.

Action Taken
6. The CAA:
   - has introduced a very comprehensive set of Flight Test Standards Guides for Flight Examiners and Flight Instructors; and
   - conducts biennial Flight Examiner/Instructor standardisation seminars for industry.
Coroner’s Recommendation 605: Operator Access to CAA Information

That the CAA further consider and improve the effectiveness of its surveillance system for operators and pilots in the General Aviation sector and give consideration to the merits of the information being made available to the operator.

Evaluation Process
1. The CAA agrees with the Coroner’s recommendation and in 2004, commenced a major review of both its audit and intervention processes.

Information Considered
2. In 2004 the CAA launched two major projects, the Surveillance Review Project and the Risk Assessment and Intervention Project. The objective of these two projects is to improve both the efficiency and the effectiveness of the surveillance process. It was to do the first in two ways, by automating the process and second, by having the appropriate people do the appropriate task, ie, auditors to audit, managers to manage and administrators to administer.

3. The effectiveness of surveillance will be improved by providing the line managers with the information they need to enable them to target their surveillance activities, that is, by providing an up-to-date risk profile of each client based on what the CAA considered to be the most relevant risk indicators. It is also designed to provide managers with guidance on what might be the most appropriate regulatory intervention based on that risk profile.

4. The preparatory projects and work are now complete, the concepts proven and the CAA is now well advanced in having surveillance systems integrated with a risk profiling and intervention process that is world leading.

CAA Conclusion
5. The CAA has concluded that the completion of the CAA Surveillance Review Project and the Risk Assessment and Intervention Project, and the introduction, at the end of each operator or organisation audit, of an updated organisational risk profile address Coroner’s Recommendation 605.

Action Taken
6. The CAA will:
   • continue to develop and improve its Surveillance and Risk Assessment and Intervention projects; and
   • introduce an updated risk profile for each operator or organisation audited, the outcome of which will be provided to that operator or organisation.
Coroner's Recommendation 607: Organisational Management Systems

That the CAA require operators with three or less aircraft, operating from two or less bases, to have a simple form of organisational management system that reflects the reality of the operation and that reflects safe practices.

Evaluation Process

1. The CAA assessed current requirements in New Zealand Civil Aviation Rule 119.124 Organisational Management System for such systems for operators in General Aviation.

Information Considered

2. New Zealand Civil Aviation Rule 119.124 Organisational Management System requires that an applicant for the grant of a General Aviation Air Operator Certificate shall establish an organisational management system to ensure compliance with the procedures required by the rule and that the procedures shall be of sufficient detail, when considering the size and complexity of the operation, to ensure that the appropriate organisational procedures are understood, implemented, and maintained at all levels of the organisation. The rule goes on, at paragraph (c) to detail the required elements of such a system.

3. However, New Zealand Civil Aviation Rule 119.124 (e) Organisational Management System states that:

   “Paragraph (c) shall not apply to an applicant for the grant of a general aviation air operator certificate that intends to conduct air operations —

   (1) with a total of three or less aircraft listed on their operations specifications; and

   (2) from a total of two or less bases.”

4. The rule is appropriate in that it requires that there be an organisational management system but that it should be neither simpler, nor more complex than is required by the actual size of the operator or applicant.

5. Accordingly, it is the responsibility of the operator to create and use an exposition that reflects the true nature of its business, with the CAA refraining from providing specific advice as to detailed content.

6. Air Adventures used a proprietary manual system which provided a ‘bare bones’ structure for the company to modify to suit its operation. As the company had five aircraft at the time of applying for certification in 2000, the standard quality system provided by the proprietary manual was appropriate. However, when the company downsized to one aircraft and one pilot in late 2002, the opportunity was not taken to simplify the exposition. During an audit in early 2003, the CAA commented that the inclusion of a full Quality Assurance system seemed excessive for the present size of the operation but it did not insist that the company change its exposition because the Chief Executive Officer claimed to be about to carry out re-expansion.
7. The CAA accepts that the Air Adventures’ company management system, as set out in its approved exposition, was more complex than necessary and did not reflect the simplicity (one aircraft) of the company’s business.

8. Accordingly, CAA is strengthening and developing its certification procedures to ensure that an operator’s management system reflects the complexity of its business.

9. In 2005 a major Certification project was commenced as a result of the Auditor General’s comments and internal audit findings that demonstrated that processes used by CAA were inconsistent. The project consists of three phases (a review of the current system; the design and development of a generic certification system, including the procedures development; and the implementation and training phase) and is well underway.

10. Finally, where a General Aviation operator with less than three aircraft and two bases is operating in accordance with New Zealand Civil Aviation Rule 119.124(c) Organisational Management System a key element of its organisational management system will be the competence of Senior Persons employed. Accordingly, minimum experience levels for New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes Senior Person Air Operations have been raised and clarified and a final rule amendment has been forwarded to the Ministry of Transport. In addition, CAA will review and upgrade other existing New Zealand Civil Aviation Rule Part 119 Air Operator – Certification Senior Person requirements.

11. CAA has also introduced a series of two-day workshops for designated Senior Persons responsible for the control and direction of maintenance (Maintenance Controller) and for air operations (Chief Pilot). Since 2003, 36 Maintenance Controller courses have been carried out nationwide. Two introductory Chief Pilot courses were held in 2007 and will be continued on a regular basis. Both courses have been received with acclamation by the industry.

CAA Conclusion

12. The CAA accepts Coroner’s Recommendation 607 and has made significant progress on major projects to overhaul its operator certification and surveillance procedures.

Action Taken

13. The CAA:

- is strengthening its certification procedures to ensure that an operator’s management system appropriately reflects the complexity of the operator’s business;

- has introduced a series of two-day workshops for designated Senior Persons responsible for the control and direction of maintenance (Maintenance Controller) and for air operations (Chief Pilot); and

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23 Rules Project Docket 6/CAR/3 Pilot Experience Levels
• increased and clarified the experience requirements for Senior Persons, in New Zealand Civil Aviation Rules Part 119 *Air Operator – Certification* and Part 135 *Air Operations – Helicopters and Small Aeroplanes*. 
Coroner's Recommendation 609: Financial Viability

That the CAA be empowered to investigate the financial viability of an operator’s business, where the CAA has reasonable belief that the safety of the operation could be compromised.

Evaluation Process
1. The CAA reviewed the powers vested in the Director under the Civil Aviation Act.

Information Considered
2. The recommendation implies a significant correlation between financial viability and operational safety. Intuitively, such a correlation might be expected but the interaction of the two is likely to be subjective. Decisions taken by an operator (and its pilots) will inevitably be coloured by the safety culture of the organisation. For example, a decision (or not) to continue an instrument approach below weather minima, in the knowledge that a diversion will certainly be costly in financial terms, might be influenced equally by pilot ego or other concern. In this situation, an operator with a good safety culture will ensure that the pilot makes the pro-safety decision even if the financial and/or non-financial consequences are comparatively significant.

3. Financial viability is only one of many factors, but is strongly influenced by the highly competitive environment that currently exists in the General Aviation industry. The sector is generally recognised as being significantly ‘undervalued’, for both operators and maintenance providers, in terms of charging for its services.

4. Joint CAA and industry safety forums in the past five years have indicated that the competitive environment and ‘undervalued’ industry are beyond the CAA’s mandate or ability to control. Discussion at these forums concluded that the CAA should focus on factors that influence safety culture by providing, for example, practical education on operational risk management techniques. The CAA needs to identify factors that lead to poor safety culture and to introduce ways of improving it. This is more likely to be effective in safety outcome terms than a focus on financial viability.

5. Legal opinion regarding the extent to which the Director can consider the relevance of an aviation participant’s financial resources, concluded that section 15 or section 15A of the Civil Aviation Act 1990 already provide the power, if certain prerequisites are met, to undertake a financial audit.

6. Under section 15, the Director must consider the audit to be necessary in the interests of civil aviation safety and security. Under section 15A, the Director must hold reasonable grounds to believe that the aviation document holder has insufficient resources to provide the authorised services in a manner that complies with the relevant prescribed safety standards and that an investigation is necessary in the interests of civil aviation safety and security. If the Director does establish that the participant’s financial resources are insufficient to ensure aviation safety, the Director can undertake his monitoring and exiting functions under sections 17 and 19 of the Act, to suspend, impose conditions on, or revoke the aviation document.
CAA Conclusion
7. The CAA concluded that the Civil Aviation Act provides the Director with the power to investigate the financial records of an operator in the interests of aviation safety.

Action Taken
8. The CAA will take no further action with respect to Coroner’s Recommendation 609.
Coroner’s Recommendation 611: Updated Safety Warning Devices

That the CAA rules require all aircraft providing passenger air transport services be fitted with appropriate safety warning devices and other up-to-date instruments, regardless of the age of the aircraft.

Evaluation Process

1. The CAA assessed the requirements of the current New Zealand Civil Aviation Rules applicable to passenger air transport services.

Information Considered

2. Airworthiness standards for an aircraft are originally set when the aircraft type design is approved by the country of manufacture. Aircraft imported into New Zealand are required to comply with the additional airworthiness requirements in New Zealand Civil Aviation Rule Part 26 Additional Airworthiness Requirements. While operating in New Zealand and under the New Zealand Civil Aviation Rules, aircraft are required to be updated from time to time by the addition of new instruments and equipment to upgrade airworthiness and to ensure an acceptable level of safety of operations. The operating Rules are more likely to impose these requirements in the case of aircraft engaged in passenger carrying operations.

3. The updating may be applied to aircraft in a number of ways, depending on the rule requirements and regardless of the age of the aircraft, where the original certification basis did not include the particular provision now sought.

4. Examples of updating in recent years include the installation of digital Flight Data Recorders and Cockpit Voice Recorders, emergency escape path lighting in airliner cabins, the fitment of automatically activated Emergency Locator Transmitters and new requirements for terrain awareness (ground proximity) warning systems in large and small aircraft.

5. A rule requiring the fitment of Terrain Awareness Warning Systems for New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes operators (aircraft and helicopters less than nine seats) is currently in preparation. The rule will be produced in two parts: the first for fixed wing powered aircraft operating under Instrument Flight Rules, and the second for helicopters engaged in certain operations.

6. The design documentation for the first part is well advanced. A draft Final Rule will be sent to the Ministry of Transport by the end of October 2007 and should be in place by mid-2008.

CAA Conclusion

7. The CAA concluded that, given the requirements of section 33 of the New Zealand Civil Aviation Act with respect to rule-making, Coroner’s Recommendation 611 is too broad in scope to be practicable as worded.
Action Taken

8. Rule making for a proposed requirement for the fitment of Terrain Awareness and Warning Systems in New Zealand Civil Aviation Rule Part 135 Air Operations – Helicopters and Small Aeroplanes aircraft operating under Instrument Flight Rules is well advanced. A draft Final Rule will be sent to the Ministry of Transport by the end of October 2007 and should be in place by mid-2008.
Coroner’s Recommendation 612: Minimum Equipment Lists

That the CAA reviews the Minimum Equipment List process to ensure the adequacy of the process to require safe, up-to-date and operable instruments for flights with fee-paying passengers.

Evaluation Process

1. The CAA reviewed its Minimum Equipment List process and the relevant rules governing Minimum Equipment Lists.

Information Considered

2. The CAA Minimum Equipment List process is well documented with clear guidelines for operators and is tightly controlled in terms of approval for individual aircraft. All Minimum Equipment Lists are based on the Master Minimum Equipment List which is determined by the airworthiness regulatory authority of the state of design for the aircraft.

3. In developing the Master Minimum Equipment List, the airworthiness regulatory authority determines the minimum operative instruments and equipment required for safe flight in that aircraft type in each authorised operating environment, using the general philosophy that the failure of any of the instruments or items of equipment required or installed in the aircraft must be compensated by other factors which provide an acceptable level of safety or further flights must be suspended until repairs or replacements can be made. A Minimum Equipment List must not be less restrictive than the applicable Master Minimum Equipment List.

4. New Zealand Civil Aviation Rule 91.537 (b) *Inoperative Instruments and Equipment* allows aircraft that do not exceed 5,700 kg Maximum Certificated Take Off Weight to operate without a Minimum Equipment List under certain circumstances. For flights with fee-paying passengers, New Zealand Civil Aviation Rule 135.353 *General* requires all of the instruments and equipment installed in the aircraft to be in operable condition, except as may be provided by an approved Minimum Equipment List.

5. Air Adventures did not comply with New Zealand Civil Aviation Rule 91.537 (b) *Inoperative Instruments and Equipment* in that the accident aircraft was being operated with unserviceable equipment (radio altimeter, second navigation receiver and flight director) without any relief by way of a Minimum Equipment List.\(^{24}\) Air Adventures had been communicating with the CAA regarding the issue of a Minimum Equipment List prior to the accident. The company was not in breach of the New Zealand Civil Aviation Rules by not having a Minimum Equipment List, but was in breach by operating with unserviceable equipment.

\(^{24}\) Transport Accident Investigation Commission, Report 03-004, paragraph 2.39
CAA Conclusion

6. The CAA has complied with this Coroner’s Recommendation 612 by reviewing the Minimum Equipment List process. It is concluded that the process is robust and appropriate.

7. However, the CAA concedes that the rule requiring 100 per cent operability in the absence of a Minimum Equipment List is somewhat impracticable in terms of day-to-day flight operations. Accordingly, the CAA will consider whether there is justification for rule making action to amend New Zealand Civil Aviation Rule 135.353 General to require a Minimum Equipment List in all Instrument Flight Rules air transport operations.

Action Taken

8. The CAA will consider whether there is a case for rule making action to amend New Zealand Civil Aviation Rule 135.353 General to require a Minimum Equipment List in all Instrument Flight Rules air transport operations.
**Coroner’s Recommendation 614: Functional Tests for Auto-Pilots**

That auto-pilots be subject to regular functional tests to ensure their reliability for all purposes.

**Evaluation Process**

1. The CAA reviewed current rule requirements, relevant aircraft Flight Manuals and Airworthiness Directives applicable to auto-pilot systems.

**Information Considered**

2. Aircraft Flight Manuals typically specify simple auto-pilot functional tests prior to take-off. The New Zealand Civil Aviation Rules require routine maintenance, including that for auto-pilots, to be in accordance with the maintenance programme prescribed by the manufacturer. The New Zealand Civil Aviation Rules also require any auto-pilot defect to be noted in the aircraft Technical Log and subsequently rectified. Airworthiness Directives applicable to auto-pilots are very few in number (there are none for the particular auto-pilot model fitted to the accident aircraft), implying a generally low defect rate.

3. Reports from other pilots who had flown the accident aircraft a short time before the accident and from the avionics engineer who maintained the equipment indicated the auto-pilot was serviceable, with its modes functioning normally. However, normal company practice on an Instrument Landing System approach was to hand-fly the aircraft. It is not clear whether or not this practice arose because the auto-pilot was unreliable as alleged by various witnesses heard during the inquest.

4. It should be noted that the New Zealand Civil Aviation Rule 135.511 *Minimum Flight Crew – IFR*, which mandates an operative auto-pilot for single-pilot Instrument Flight Rules operations, requires automatic heading and altitude hold only, not a coupled approach mode. This is in line with international practice.

**CAA Conclusion**

5. In the Air Adventures accident, the pilot was not using the auto-pilot for a coupled approach at the time of the accident and, although this would have been desirable, he was not required to do so. New Zealand Civil Aviation Rule 135.511 *Minimum Flight Crew – IFR* does not require the auto-pilot to have a coupled approach mode and this is in line with international practice.

6. Auto-pilots are required to be maintained in accordance with the manufacturer’s instructions and experience shows that they are generally reliable. The New Zealand Civil Aviation Rules specify routine procedures for rectifying any defects noted by the

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25 Federal Aviation Authority approved Flight Manual for PA-31-350 Navajo Chieftain, pp 3-47

26 Transport Accident Investigation Commission, Report 03-004, paragraph 1.6.11

27 Joint Aviation Requirement Operations 1.655
pilot. Accordingly, the CAA concludes that there is no case for additional rule-making action on Coroner’s Recommendation 614.

**Action Taken**

7. The CAA will take no further action with respect to Coroner’s Recommendation 614.
Coroner's Recommendation 616: Rules for Operation of Cell Phones

(i) That the CAA implement measures to enforce the provisions of New Zealand Civil Aviation Rule 91.7 (a) Portable Electronic Devices with respect to Instrument Flight Rules flights; and

(ii) That the CAA consider Rules as to any pilot-in-command or co-pilot having a cell phone in his or her procession in the cockpit of an aircraft during flight.

Evaluation Process

1. The CAA reviewed:

   • the requirements of the Civil Aviation Act and the New Zealand Civil Aviation Rules with respect to the use of cell phones on aircraft;
   
   • safety risks associated with pilots not being able to access cell phones as a means of communication in certain circumstances; and
   
   • existing educational and guidance information relating to the use of cell phones on aircraft.

Information Considered

2. With regard to recommendation (i) it should be noted that the operation of cell phones is already prohibited on operations under Instrument Flight Rules by New Zealand Civil Aviation Rule 91.7 Portable Electronic Devices.

3. Offence regulations are in place to enforce the provisions of the rule. In addition, section 65L of the Civil Aviation Act makes it an offence to operate a portable electronic device in breach of the rules. The offence is one of the ‘unruly passenger’ offences for which an infringement notice may be issued under sections 65P and 65Q of the Civil Aviation Act, with an infringement penalty of $500. Aviation Security Officers or the Police are authorised to issue the notices. Six were issued in 2005 and three in 2006.

4. However, with regard to Recommendation (ii) it is considered that cell phones are useful aids to pilots, particularly in facilitating pre-flight and post-flight actions and as an emergency back-up. When filing a flight plan with Airways Corporation, there is a standard request for the pilot’s cell phone number. In the rare instance of failure of communications with Air Traffic Control, the New Zealand Aeronautical Information Publication advises the pilot to adopt a number of procedures, one of which is to attempt to contact Air Traffic Control via cell phone.

5. Although such use would be contrary to New Zealand Civil Aviation Rule 91.7 (a) Portable Electronic Devices the pilot would be unlikely to use a cell phone during a critical phase of flight and its use would be covered by the Civil Aviation Act section 13A Duties of pilot-in-command and operator during emergencies. Therefore, an outright ban on pilots having a cell phone in their possession during flight would not only require special stowage arrangements but would be counter to safety. Given the
very prescriptive nature of the present rule, a ban on possession is considered to be unnecessary.

6. Ongoing education on the rule is, however, desirable. The CAA’s *Vector* magazine July/August 2004 issue contained a comprehensive article on the use of cell phones in flight based on the subject accident. All safety education needs refreshing from time to time and the CAA will ensure it is done in this case.

**CAA Conclusion**

7. The CAA has considered whether pilots should be banned from having cell phones in their possession in the cockpit during flight and has concluded that such a ban would be counter to safety.

8. The CAA intends to continue ongoing education of pilots on the current rule and will enhance the enforcement of its provisions by drawing it to the attention of passengers via briefing cards that will also indicate an avenue of complaint direct to the CAA.

**Action Taken**

9. The CAA will continue ongoing education of pilots on the current rule and will enhance the enforcement of its provisions by drawing it to the attention of passengers via briefing cards that will also indicate an avenue of complaint direct to the CAA.

10. The CAA will take no further action, other than the above, with respect to Coroner’s Recommendation 616.

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