Senate Rural and Regional Affairs and Transport References Committee

Written Questions on Notice – Friday, 21 December 2012 from Public Hearing Wednesday, 21 November 2012

CANBERRA, ACT

Inquiry into aviation accident investigations

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SENATE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Inquiry into aviation accident investigations

Questions Taken on Notice – Office of the Australian Information Commissioner from Public Hearing – Wednesday, 21 November 2012

Written Questions on Notice- Senator Xenophon

PREAMBLE

Your evidence to the Committee seemed to gravitate naturally to the FOI Act. My primary interest is in your Information Policy advice and secondarily in the reach and restrictions of the Privacy Act. This Inquiry is also interested in matters incidental to the Pel-Air ditching but directly related to the handling of material created or acquired in the pursuit of aviation safety, including formal investigations.

Pilots are compelled to make mandatory incident reports to the ATSB, with penalties for non-compliance as high as 12 months imprisonment. The information may not be protected from disclosure unless the ATSB exercises its discretion to conduct a formal investigation. The ATSB, the safety investigator, now proposes to provide CASA, the regulator, with access to the detailed and compulsory reports which may provide prima facie evidence of a range of potential breaches of strict liability regulations.

On the other hand, CASA refuses to disclose a range of information to the public on the basis of privacy requirements. I am interested in an independent view as to whether the CASA position is properly founded on the privacy principles or whether the public interest is being thwarted.

I am also interested as to the extent that certain records kept by operators to meet requirements set by CASA can be protected at least in part from being provided to CASA for their unfettered use.

1. I asked you: "What is the appropriate treatment for audits and safety-related administrative actions in regard to both corporations and individuals?" You spoke of the FOI exemptions. In the normal course of events:

   (a) Are compliance audits protected from public disclosure by the Privacy Act?

   (b) Are safety-related administrative actions in regard to both corporations and individuals protected from public disclosure by the Privacy Act?

   (c) What is the public interest test in each of those cases?

2. Do the privacy interests of corporations and individuals invariably override the public interest?

3. Is there anything that would prevent CASA maintaining publicly available registers of Air Operators Certificates, Accountable Persons and Statutory Office holders (like Head of Flight Operations and Head of Training & Checking)? What about approvals such as Check Pilots?

4. I asked you: “In a general sense, if something is releasable under FOI, why shouldn’t that information be more generally available rather than having to force access under FOI?” In the brief discussion that followed, you spoke of FOI disclosure logs and the lack of compulsion for agencies to review their publication policies. Are you aware of any overseas or other practices where agencies are directed in what they must provide in public registers pursuant to their regulatory powers?

5. I realise that some of the detail of these questions have been touched upon, but I ask them again to give you the option for more fulsome answers should you wish to elaborate. Civil Aviation Orders require a number of records to be made and retained by operators. In regard to individual pilots, those records include assessments and commentary by instructors and assessors on a pilots performance under training and when being tested. Clearly, some of the material is quite personal.

   (a) In your view, does the fact that these records are required by law materially determine the ownership, control and ultimate use of those documents?

   (b) Does CASA have the right to access them and use them as they see fit? Can there be some element of privacy afforded to the individual by the Privacy Act that limits or prevents CASA from unencumbered access to material in the hands of an operator?

   (c) Is CASA prevented from asking for more personal information than the relevant legislation strictly authorises?

(d) Does CASA have any right to access an operator’s internal investigations related to operational matters? What about internal disciplinary proceedings related to operational matters?

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On the other hand, CASA refuses to disclose a range of information to the public on the basis of privacy requirements. I am interested in an independent view as to whether the CASA position is properly founded on the privacy principles or whether the public interest is being thwarted.

I am also interested as to the extent that certain records kept by operators to meet requirements set by CASA can be protected at least in part from being provided to CASA for their unfettered use.

Information Commissioner Response

I will give a brief response to these two questions.

As to the first question (CASA's reliance on privacy requirements to deny release of information) I can only make general remarks as I am not across any instances in which this may have happened. A longer explanation of the privacy framework is given below.

Generally, an agency has a discretion as to how much information it releases publicly, subject to any secrecy provision that precludes public release. However, an agency should not release 'personal information', as defined in the Privacy Act, if doing so would be a breach of Information Privacy Principle 11. In combination, IPP 11 and the Freedom of

Information Act 1982 s 47F mean that an agency should not release personal information if doing so would involve an 'unreasonable disclosure' and disclosure 'at that time would, on balance, be contrary to the public interest'. This has to be determined from case to the next.

Many documents are a mixture of personal information and non-personal information. Privacy considerations do not prevent the release of the non-personal information, provided the identity of a person could not reasonably be ascertained from the information released.

I have no comment to make on the second question (whether records kept by operators can be kept from CASA). The answer to this question will be set out in legislation which specifies the information gathering powers of a regulatory body such as CASA and the uses to which it can put the information it obtains. This is not an issue that has come up in my work as Information Commissioner. However, a general report on the topic was completed in 2008 by the Administrative Review Council, *The Coercive Information-Gathering Powers of Government Agencies,* Report No 48 (2008).

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1. *I asked you: "What is the appropriate treatment for audits and safety-related administrative actions in regard to both corporations and individuals?" You spoke of the FOI exemptions. In the normal course of events:*

   (a) Are compliance audits protected from public disclosure by the Privacy Act?

   (b) Are safety-related administrative actions in regard to both corporations and individuals protected from public disclosure by the Privacy Act?

   (c) What is the public interest test in each of those cases?

Information Commissioner Response

My short answer to those three questions is:

(a) Only to the extent that an audit report contains personal information that would reasonably identify a person, if disclosure would be unreasonable and contrary to the public interest
(b) The same answer in (a) so far as personal information is contained in a safety-related document. The answer is different as regards corporate information in a safety-related document. The Privacy Act does not protect the confidentiality of business information. However, there may be other interests that warrant protection against disclosure (eg, protection of trade secrets).
(c) The concept of public interest, as used in the FOI Act and in the general law, requires a balance to be struck between the considerations favouring a particular outcome and the considerations against that outcome. That is why the FOI Act speaks of

> disclosure 'at that time would, on balance, be contrary to the public interest' (s 11A(5)). Consequently, it is necessary to look separately at the facts of any case to decide where the balance of public interest lies.

I will now outline more generally how the Privacy Act may apply to the questions you have raised.

The Privacy Act protects the personal information of individuals through the application of binding privacy principles. The Information Privacy Principles (IPPs) in section 14 of the Act regulate the personal information handling practices of Australian Government, ACT and Norfolk Island agencies. The National Privacy Principles (NPPs) in Schedule 3 of the Privacy Act regulate the personal information handling practices of private sector organisations with an annual turnover greater than $3 million, all private industry health service providers, and some small businesses. Both sets of principles encompass the collection, security, use and disclosure of personal information.

The Privacy Act differs conceptually from legislative secrecy provisions in that it regulates broader information handling practices. Secrecy provisions, on the other hand, focus on controlling the disclosure of specified information. An example is the provisions in Part 6 of the *Transport Safety Investigation Act 2003* to protect on-board recordings and other information collected and used by the ATSB in the performance of its functions. There are also corresponding provisions in Part IIIB of the *Civil Aviation Act 1988* to protect cockpit voice recordings.

The Privacy Act only applies to personal information and it does not protect the confidentiality of business information. Personal information is a narrower concept than privacy in the more popular sense. It is defined at s 6(1) of the Privacy Act:

> [P]ersonal information means information or an opinion....about an individual whose identity is apparent, or can reasonably be ascertained, from the information or opinion.

Where an Australian government agency holds personal information collected as part of a compliance audit or safety-related administrative action, the agency must not disclose the information unless permitted by a specified exception to IPP 11. Exceptions in IPP 11 may permit disclosure where, for example, the disclosure is required or authorised by law (IPP 11.1(d)) or for certain law enforcement reasons (IPP 11.1(e)). The reference to 'required or authorised by law' implicitly invokes the FOI Act, since that Act defines the exemption criteria an agency must apply in handling a request for access to documents. As noted above, s 47F of the FOI Act provides that 'personal information' is exempt if disclosure would be unreasonable and contrary to the public interest.

There is limited privacy protection for private sector employees under the Privacy Act. The handling of employee records directly relating to the employment relationship is generally

exempt from the operation of the Privacy Act.[1] As such the privacy principles are unlikely to apply to personal information contained in records related to the employee's performance or conduct as well as the training or disciplining of the employee by the organisation.

In *For Your Information: Australian Privacy Law and Practice*, (ALRC Report 108), the ALRC examined this issue and recommended the removal of the employee records exemption.[2] In its submissions to the ALRC's inquiry leading to that report the former Office of the Privacy Commissioner on balance supported the removal of the employee records exemption.[3] The Australian Government has indicated that it will be considering this recommendation as part of a second stage response to ALRC Report 108. However, no timeframe has been announced for the second stage response.

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2. Do the privacy interests of corporations and individuals invariably override the public interest?

Information Commissioner Response

My short answer to this question is no.

As noted above, the Privacy Act does not recognise the concept of corporate privacy. There are exemptions in the FOI Act to protect trade secrets and commercially valuable information (s 47); and business information where disclosure could adversely affect the lawful activities of a business organisation, and in addition disclosure would be contrary to the public interest. Personal information is protected against disclosure only if disclosure would be unreasonable and contrary to the public interest. As that summary indicates, business and private considerations do not override the public interest, but must be balanced against other considerations that support disclosure.

More generally, I observe that the right to privacy is not absolute, though any incursion on that right should be carefully assessed and be proportional to the problem it is seeking to address. For example, rights to privacy must be balanced with the public interest in agencies discharging their functions efficiently and effectively. For proposals or activities involving a privacy impact on individuals, a careful assessment may identify alternatives that achieve the same outcome without any, or minimal, privacy impact.[4]

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[1] Private organisations are exempt from the operation of the Privacy Act where an act or practice is directly related to: the employment relationship between the organisation and the individual; and an employee record held by the organisation. See Privacy Act ss 7(1)(ee), 7B(3).
[2] Recommendation 40-1
[3] See the Office of the Privacy Commissioner's submission to the ALRC's Discussion Paper 72, Chapter 36, p 461 available at http://www.privacy.gov.au/publications/submissions/alrc_72/PartE.html#ach6
[4] See OAIC, *Privacy Impact Assessment Guide*, May 2010, http://www.oaic.gov.au/publications/guidelines/Privacy_Impact_Assessment_Guide.html

For new proposals or existing agency operations that affect privacy (and which fall outside the operation of the Privacy Act), it is for the government to decide where the appropriate balance lies between the competing public interests of protecting individual privacy and advancing agency outcomes. In determining that balance, it would be necessary to clarify the different objectives of protecting personal information and protecting the integrity of accident investigations and the safety of the travelling public.

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3. *Is there anything that would prevent CASA maintaining publicly available registers of Air Operators Certificates, Accountable Persons and Statutory Office holders (like Head of Flight Operations and Head of Training & Checking)? What about approvals such as Check Pilots?*

Information Commissioner Response

The short answer is that agencies have a wide discretion to establish public registers of information they hold. The FOI Act promotes the proactive publication of information (s 8(4)). Practical issues that are likely to arise for an agency in establishing a public register include: the cost of doing so and likely public interest in the register; not including protected personal or business information on the register; and ensuring the accuracy of information on the register.

The general privacy considerations that an agency would need to bear in mind include the following. From a privacy perspective it is preferable that the handling of personal information by agencies be open, transparent and accountable. Within the context of a public register this approach enables individuals to have a clear understanding about what is a permitted access, use or disclosure of their personal information. It also provides a mechanism for the agency to effectively manage individuals' expectations about how their information is handled.

At the time of collecting the information, individuals should be made aware that their personal information will appear on a public register, who will have access to the public register, and what their personal information may be used for. Ensuring clarity and certainty about how individuals' personal information will be handled in relation to registers will lead to greater trust and confidence in the register.

If a public register is established by CASA, consideration should be given to the impact on the privacy and business interests of individuals whose information is contained in the register and whether publishing this information is reasonable in the circumstances. Disclosure of information through a public register should occur in a proportionate way that furthers the relevant policy intent, while avoiding the unnecessary disclosure of personal information. In the absence of any specific statutory scheme, CASA would need to ensure that it complies with its obligations under the IPPs in establishing any such public register.

4. *I asked you: "In a general sense, if something is releasable under FOI, why shouldn't that information be more generally available rather than having to force access under FOI?" In the brief discussion that followed, you spoke of FOI disclosure logs and the lack of compulsion for agencies to review their publication policies. Are you aware of any overseas or other practices where agencies are directed in what they must provide in public registers pursuant to their regulatory powers?*

Information Commissioner Response

I cannot point to any foreign examples of public registers. However, there are relevant Australian examples. For example, the *Personal Property Securities Act 2009* (Cth) established a national, online Personal Property Securities Register and contains a number of mechanisms to protect individual grantors and other members of the public from misuse of the register. There are similar examples of public registers in corporations legislation.

The OAIC encourages agencies to be proactive in making available information that is in the public interest or that may commonly be sought. Proactive publication of government information on the web has become a strong theme in government policy and practice in recent years, as reflected in the *Declaration of Open Government* and the FOI Act reforms in 2010. The OAIC also encourages agencies to set up administrative access schemes to release government information, in response to specific requests, outside the formal process set out in the FOI Act.[5] However, such schemes are not effective where statutory secrecy provisions or privacy obligations would prevent release of the information. Both the ATSB and CASA are subject to statutory constraints on the release of certain information which they hold.

5. *I realise that some of the detail of these questions have been touched upon, but I ask them again to give you the option for more fulsome answers should you wish to elaborate. Civil Aviation Orders require a number of records to be made and retained by operators. In regard to individual pilots, those records include assessments and commentary by instructors and assessors on a pilots performance under training and when being tested. Clearly, some of the material is quite personal.*

   (a) *In your view, does the fact that these records are required by law materially determine the ownership, control and ultimate use of those documents?*

[5] See Agency Resource 14: Access to government information – administrative access schemes at http://www.oaic.gov.au/publications/agency_resources/agency_resource14_admin_access_schemes.html

(b) *Does CASA have the right to access them and use them as they see fit? Can there be some element of privacy afforded to the individual by the Privacy Act that limits or prevents CASA from unencumbered access to material in the hands of an operator?*

(c) *Is CASA prevented from asking for more personal information than the relevant legislation strictly authorises?*

(d) *Does CASA have any right to access an operator's internal investigations related to operational matters? What about internal disciplinary proceedings related to operational matters?*

Information Commissioner Response

Neither the Privacy Act nor the FOI Act confers upon CASA or any other government agency (except the OAIC) a right to access records held by private sector organisations. The usual approach is that information gathering powers are conferred upon agencies in the legislation they administer (for example, the *Civil Aviation Act 1988*). Legislation of that kind will define the scope of any powers and also state whether a person can object to providing information to a government agency, for example, on the grounds of legal professional privilege.

This is a question of CASA's powers and functions as granted by its governing legislation, rather than the Privacy Act or the FOI Act. The issue of CASA's access powers does not fall within the OAIC's jurisdiction. I am unable to comment further other than to observe that (as the above discussion indicates) it is open to the Parliament either to protect the confidentiality of information held by an individual or corporation, or to give a government agency access to that information.

SENATE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Inquiry into aviation accident investigations

Written Questions Taken on Notice – Australian Transport Safety Bureau from Public Hearing – Wednesday, 21 November 2012

Written Questions on Notice- Senator Xenophon

1. Your third supplementary submission refuting Mr Davies' analysis is acknowledged, as is Mr Davies' refutation and further explanation.

   (a) Has the ATSB completed a model flight plan for VH-NGA for the ditching flight using the available weather information, including contingencies and potential diversions?

   (b) Did the ATSB rely on the CASA fuel analysis that underpinned CASA Accident Liaison and Investigation Unit Accident Investigation Report 09/3?

   (c) If the ATSB did complete a model flight plan for VH-NGA, was CASA asked to provide the ATSB with an independent fuel analysis for verification of the assumptions and decision rules?

   (d) Why isn't a model flight plan for VH-NGA included in the analysis section of the report?

   (e) Is the factual basis of the ATSB fuel analysis available to the Committee in the papers already supplied?

2. In regard to the planning of diversion, either enroute or from the destination, to an alternate airport:

   (a) On what aircraft configuration does the ATSB consider diversions should be planned: normal all engines operating or for the most limited contingency configuration?

   (b) What advice, if any, was requested or otherwise provided by CASA in regard to the most appropriate planning configuration for diversions to alternate airports?

3. In regard to in-flight decision–making:

   (a) What advice does the ATSB believe should be given to the aviation community when faced with weather that significantly deteriorates below the original planning basis?

   (b) Should an aircraft divert when the forecast falls below the alternate minima but not below the landing minima and it is clear that alternate fuel will not be available at the destination?

   (c) Where should that advice appear?

4. What does the ATSB see as the respective duties imposed by sub-regulations (1) and (2) of CAR 234?

5. In regard to the advice provided to pilots:

   (a) Does the ATSB consider that Civil Aviation Advisory Publication (CAAP) 234-1(1) provides adequate and clear advice on individual and shared responsibilities set out in CAR 234?

   (b) Does the ATSB consider that CAAP 234-1(1) provides adequate and clear advice on fuel planning to satisfy the requirements of CAR 234?

6. Did the ATSB form a view about the adequacy of Pel-Air's ditching procedures and CASA's involvement in the formulation of those procedures?

7. Did the ATSB form a view about the adequacy of the safety equipment standards related to the equipment that was used or required for the flight and in the subsequent ditching?

8. In regard to emergency procedures:

   (a) Did the ATSB form a view about the adequacy of the emergency procedures and safety equipment training required by Civil Aviation Order (CAO) 20.11?

   (b) Did the ATSB form a view about the adequacy of the emergency procedures and safety equipment training provided by Pel-Air?

   (c) Was each of the pilots compliant with the emergency procedures training requirements?

   (d) Was or should emergency procedures training have been provided to the medical team?

9. Did the ATSB consider revisiting, reviewing or emphasising its previous recommendation on the classification of aeromedical flights?

10. In regard to the planning of alternates:

    (a) Did the ATSB form a view about the adequacy of the CAO 82.0 alternate requirements for remote islands and the exemption of aerial work flights from those requirements?

    (b) Are there any circumstances where the ATSB considered that a mandatory alternate should not be required for any class of operation?

    (c) Did the ATSB consider that night operations to remote islands might require special consideration?

11. In regard to ATPL theory requirements:

    (a) Did the ATSB form a view about the adequacy of the ATPL syllabus to instil all of the required flight planning considerations, both for despatch and in-flight planning, for remote island operations?

    (b) Does the ATSB believe that passing the ATPL exams will ensure future competence in all types of operations?

12. In regard to mandatory Training and Checking (T&C):

    (a) Did the ATSB form a view about the adequacy of the Training and Checking (T&C) regime provided by Pel-Air to its flight crew in meeting its requirements under Civil Aviation Regulation (CAR) 217 and CAO 82.1?

    (b) Did the scope of the T&C regime extend beyond aircraft emergency and abnormal procedures to broader operational considerations?

    (c) If not, did the ATSB form a view that it should?

    (d) Did the ATSB form a view about the adequacy of the training and experience of the T&C staff?

    (e) Did the ATSB form a view about the adequacy of the supervision of the T&C staff by CASA?

    (f) Did the ATSB form a view about whether the T&C Manual was appropriate for the management of the T&C organisation?

    (g) Did Pel-Air have a Command Upgrade training program?

        (i) If so, did the ATSB form a view about its adequacy?

        (ii) If there was no Command Upgrade training program, did the ATSB form a view about the need for such a program?

13. In regard to fatigue risk management:

    (a) What Flight and Duty Times rules was the Pel-Air Fatigue Risk Management System (FRMS)based on?

    (b) Did the ATSB form a view about the adequacy of the FRMS to manage fatigue risk?

    (c) Was the FRMS being properly implemented?

    (d) Did Pel-Air and CASA have a regular review cycle of the FRMS?

        (i) If so, was it effective?

        (ii) If not, should it have been in place?

14. In regard to fatigue as a factor in the accident, there appears to be a considerable shift in the investigation. In early draft reports, there seems to be no evidence to support the crew's performance being affected by fatigue, but that then shifts to some effect on performance until, in the final report, it is likely to have had some effect:

    (a) How did the findings around fatigue develop?

    (b) Was there new evidence emerging?

(c) the report acknowledged that it is likely that the flight crew were experiencing a significant level of fatigue on the flight to Samoa and were likely experiencing fatigue on the return flight:

(i) How did the ATSB reconcile the evidence of disrupted sleep opportunity described in the CASA Accident Investigation Report?

(ii) Why does the report state that there was "insufficient evidence available to determine the level of fatigue or the extent to which it may have contributed to him not comprehending the significance of the 0800 SPECI"?

(d) Was a science-based fatigue study undertaken?

(i) If so, who did it and when?

15. In regard to organisational issues:

(a) Did the ATSB form a view about the adequacy of the Pel-Air organisation to properly supervise the conduct of all flight operations conducted under their AOC?

(b) Was the informal organisation identified by Dominic James (e.g., the preference to bypass the new Chief Pilot in favour of the previous Chief Pilot) explored by the ATSB to determine its true organisational effect on command and control of flight operations?

(c) Did the informal organisation affect regulatory compliance and safety reporting?

16. Did the ATSB form a view about the adequacy of CASA's oversight of Pel-Air in general and the aeromedical flights in particular?

17. In regard to hazardous weather alerting:

(a) Did the ATSB form a view about the adequacy of the procedures for the alerting of flight crew engaged in international flights to significant weather changes at their destination?

(b) Was any comparison made between Airservices procedures and other nations' air traffic services for hazardous weather alerts?

18. Would the ATSB expect that the subject matter of questions 2-17 above would generate detailed discussion in the report and also form the basis of recommendations for improvement? If not, why not?

19. Airservices on Monday 19 November 2012 gave evidence that there had been no contact with them from the ATSB in regard to the circumstances of the ditching flight. Is that indicative of you concluding that there were no air traffic services considerations to pursue?

20. What were the frequency, nature and scope of discussions between the investigating team (NOT the management as discussed in Day 1 public evidence) and various levels within CASA?

21. The following statement is made on page 35 of the final report:

Five different operators were interviewed and provided relevant sections of their operations manuals for review. Those manuals generally reflected the requirements of CAAP 234-1 but also had individual operational requirements appended. However, they either had no guidance, or did not provide consistent guidance on the process to be used when deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island.

At the 22 October hearing Mr McCormick stated:

In the particular case of remote island operations, there are six other operators conducting aeromedical evacuation flights. After the Pel-Air ditching we audited those six. We went and looked to see what they were doing. ***None of those had an issue****. Norfolk Island has been flown to for many years, by Pel-Air as well in various iteration, without there being an issue. But it is a tricky place to fly to, I think we all agree"*

(a) How does the ATSB reconcile the statement in the report with the statement by Mr McCormick?

(b) Who were the five operators the ATSB interviewed?

22. On what basis did the ATSB amend the far more precise draft report (16 July) from:

Clearer guidance on the in-flight management by crews of previously unforecast, but deteriorating destination weather may have influenced the crew to consider their diversion options earlier, allowing more time for the necessary planning. However, the operator's limited oversight of its aeromedical operation increased the risk that crews would develop their own pre- and in-flight management methods, diminishing the reliability of its own risk controls in such operations.

To the much more generalised final version:

The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not minimise the risks associated with aeromedical operations to remote islands. In addition, clearer guidance on the in-flight management of previously unforecast, but deteriorating, destination weather might have assisted the crew to consider and plan their diversion options earlier.

23. In the ATSB's view, what would be the risks and benefits of a possible amendment to the Transport Safety Investigation Act 2003 to make draft ATSB reports and Directly Involved Parties submissions publicly available?

24. Would the ATSB provide an analysis of the number of recommendations and/or identification of critical safety issues contained in all aviation accident investigation reports from 2001 to 2012? This analysis should clearly indicate:

(a) how many recommendations or critical safety issues were made or identified between 2001–2005 and since 2006–2012;

(b) if there has been a decrease in the number of recommendations or critical safety issues since 2005, please explain why this has been the case;

(c) how many recommendations or critical safety issues have been made or identified specifically to CASA and to Airservices Australia regarding improvements to aviation safety arising from aviation accident investigations;

(d) what proportion of recommendations or critical safety issues specific to CASA and to Airservices Australia were made or identified between 2001–2005 and since 2006–2012;

(e) what the response to each recommendation or critical safety issue specific to CASA and to Airservices Australia has been;

(f) what action has been taken to address each recommendation or critical safety issue; and

(g) the time taken to respond and to act on each recommendation or critical safety issue.

25. Documentation indicates a s32 request was made on 4 July 2012 for the CASA Special Audit. When was the audit sent by CASA? When did it arrive? The committee is aware of the fact that the ATSB knew about the CASA Special Audit when the audit was announced. That being the case, why did the ATSB wait for over two years to request it? Your supplementary submission (annex), which covers where the special audit was included in the ATSB report, appears to come from the March version of the report. Is that the case? How can the ATSB report refer to the Special Audit in the March 2012 draft when it appears the ATSB were not yet in possession of it?

26. What are the normal processes around requesting CASA special audits? If the ATSB report was approved for public release on 16 July as indicated in the ATSB submission, was there sufficient time to consider the findings of the CASA special audit if it was not formally requested until 4 July?

27. From documentation, it appears that on 5 July 2011 a safety issue was provided to CASA which stated: Safe fuel management systems for use on long flights are not universally implemented in Australian charter and airwork operations. [Significant safety issue]. How does that work through to the final report to become a minor safety issue which appears to be slightly different? (p.43)

28. From documentation, it appears that on 5 July 2011 a safety issue was sent to the operator which stated: The operator did not provide the crew with the training or oversight to assure that the crew would flight plan to meet fuel requirements for abnormal operations as prescribed in the company operations manual [minor safety issue]. How does that work through to the final report of a minor safety issue which appears to be different? (p.43)

29. Given the number of actions required of the operator as a result of the CASA special audit, which included RCAs and voluntarily ceasing operations, would the ATSB please explain how this is classified as a minor safety issue?

30. In a minute from CASA dated 27 April 2012, CASA suggests that it might be helpful to note the lifejacket manufacturer and model and the time of the rescue, as the survivors reported that

by the time they were rescued most of the life jacket lights had stopped working. Why was this issue not highlighted in the final report? Was there discussion of this with CASA?

31. It seems that a major rewrite of the report was undertaken by Mr Sangston with assistance from Mr Armstrong and Mr Robertson around July/August 2011, and that this took a different view to the IIC. Management appeared to favour the individual over the systemic emphasis. Given the IIC had a more detailed knowledge of the facts, how does the ATSB justify the removal of contributing safety factors from the report?

32. At the 21 November 2012 hearing Mr Dolan mentioned going beyond the Reason model. What methodology are you now using and what research is it based on? Is this new methodology internationally recognised? How does it differ from the Reason model? Is it diluting the influence of the investigator?

33. According to the ATSB submission (p. 43), on 16 July 2012, the second draft report was released to DIPs with comments due 26 July 2012. Also on 16 July 2012, the final report was approved by the Commission for release to the public under section 25 of the TSI Act. Could you please explain how and why the final report was approved by the Commission prior to the closing date for DIP comments?

34. Did the ATSB check the servicing history of the lifejackets? Why did you not make a recommendation that lifejackets be checked?

35. If the life-raft was improperly placed in the aisle un-secured, should it be a Safety Recommendation to CASA and Operators to check this SOP in their manuals?

36. Why is the lack of up to date emergency training not mentioned in the factual evidence and analysis? It appears that the wet drills training had expired for the flight crew. How would a reader know this?

37. On page 32 of the final report what does the following sentence mean? Does it mean it did not occur, or does it mean that the ATSB can't establish the facts?

    'There was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crews' compliance with the operator's procedures.'

    Could that paragraph be reworded in the following way to reflect the findings of the CASA special audit?

    "There was evidence that indicated the operator did not routinely assure itself of the accuracy of the pilots international flight planning and forms or their in-flight management logs and crews' compliance with the operator's procedures".

38. Can you please explain the following change from the drafts to the final report and what evidence resulted in the change? In the final report is the ATSB stating that they cannot find the evidence, or is the ATSB stating that the logs were not filled out correctly? The CASA Special Audit found the operator did not complete the in-flight navigation logs. Why is this not written in plain, unambiguous language as per the ICAO Accident Manual requirements?

26 March 2012 draft:

There was no evidence in the operator's training file for the PIC to suggest the completion of that additional training during his post-endorsement training.

Final:

There was no requirement in the operations manual for the content of such training to be recorded. The Australian Transport Safety Bureau (ATSB) was unable to independently confirm the extent of the PIC's post-endorsement training.

From 16 July draft

Flight crews were expected to use their own methods, systems and tools for pre-flight planning. It was reported that copilots modified their techniques to reflect the preferred methods for each PIC with whom they flew.

Final

*"Flight crews were expected to use their own methods, systems and tools for pre-flight planning in compliance with the provisions of the operations manual. It was reported that copilots modified their techniques to reflect the preferred methods for each PIC with whom they flew***. *There was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crews' compliance with the operator's procedures.***

39. Why were the following paragraphs removed from the 16 July 2012 draft of the report? What evidence was presented to the ATSB to remove this criticism of the operator?

"However, the operator's expectation that pilots would use their own methods, systems and tools for pre-flight planning had the potential to dilute those regulatory and procedural requirements as risk controls. To some extent, this might explain the pilot in command's (PIC) actions to develop the flight plan for the flight to Norfolk Island by reversing his outbound flight plan to Apia and applying the previously-experienced upper winds and NOTAMs to his planning for the return flight via Norfolk Island.

Similarly, by not specifically requiring the copilot to partake in the flight planning, and not overtly following the flight or ensuring the availability of operational and communications support at Apia, the operator precluded these additional potential safety defences from having effect. Together with the operator's normal process of not requiring crews to report to the operator if a flight was progressing satisfactorily, this would have increased the isolation felt by its crews, and prevented a full understanding by the operator of the residual risk affecting a flight"

40. What does the following mean? Why is it written in language that is not clear? Did the operator conduct post-endorsement training or ongoing proficiency checks as required by the operators manual?

However, in the absence of any independent record of post-endorsement training or proficiency checks of that knowledge, the ATSB was unable to independently determine the PIC's ongoing exposure to, and application of those requirements in the Westwind. Clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions.

41. Please explain the following change. What evidence was received?

Draft (16 July):

The operator's limited oversight of the aeromedical operation and flight planning guidance prevented a full understanding by the operator of the residual risk affecting the operation. [Minor safety issue]

Final:

The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not effectively minimise the risks associated with aeromedical operations to remote islands. [Minor safety issue]

42. Please explain the following change. What evidence was received?

Draft (16 July):

• Formal training for international operations was implemented.
• A refresher training course for Westwind pilots was implemented, covering:
– Compliance, company structure, standard operating procedures, fuel calculations, flight planning and company human resources policies.
– Knowledge of Westwind and CAO 20.7.1.B performance requirements, and the calculation of take-off data and CAO 100.7 weight and balance calculations.
– Human factors, incorporating crew resource management and threat and error management skills (this course will take place biennially).
– Revalidate all crew on the principles of Global Positioning System equipment for en-route navigation.
– Safety Management System (SMS) training and in the Company Safety Policy.
– Ensure crew have a complete understanding of the FAID® system as part of the company's fatigue risk management system and to ensure pilots understand and are proficient in completing the fatigue aspects of the operator's SMS reporting system.
– Knowledge of aircraft systems.
– Instrument flight rules and procedures.
– Defect reporting requirements and the use of the aircraft maintenance log.
– Point of no return training, and training in the use of the 'Howgozit' graph for monitoring fuel use during long flights.
– The amended Westwind fuel policy.
The plan was initially supported by detailed pilot operations notice P47/09, which laid out the new operating requirements for Westwind operations. The general requirements were later transferred into the operations manual and supported by a shorter pilot operations notice, P 38/10, which provided Westwind-specific nominal fuel planning figures.
The operator is planning a review of the above changes, in consultation with the initial change agents, to assess the relevance of the implemented changes as an effective risk mitigation. Any subsequent change to the operator's processes will be controlled through the review process.

Final:

A refresher training course for Westwind pilots was implemented that covered required knowledge for Westwind operations.

43. It seems the aircraft was not certified for RVSM operations in RVSM airspace despite planning and operating in Fiji airspace and Auckland Oceanic RVSM airspace. This appears to be contrary to the Fiji AIP dated Nov 2006 and the NZ AIP dated 15 Nov 2007. Section 1.3.7 of the AIP outlines the purpose of 1.3.5 as not being a method to circumvent the normal RVSM approval process. At the 21 November hearing Mr Dolan stated that the operator was exempt as an aeromedical flight (p.16). The AIP appears to only exempt one off flights, such as mercy flights or humanitarian flights, not regular commercial flights as per 1.3.7. Would you please explain these apparent differences to the committee? Is there evidence that 4 hours notice was given?

44. Given the issue outlined above could you please explain an email from Mr James from 25 December 2008 to the head of Pel-Air, which in part reads:

"Had big issue with NZ ATC over not being RVSM again but needing to fly in RVSM airspace – I feel like we're on borrowed time with this one – soon they will just say no and put us down to 28 thousand – will be a big deal then."

45. Would you please address the evidence in the April 2003 study in Mr Aherne's submission where the operator breached RVSM airspace many times?

46. How did the ATSB treat the findings of CASA Special Audit (p.17) that some proficiency checks were undertaken by unapproved persons?

47. In the ATSB's submission, there is mention of work underway to enable readers of ATSB final reports to see 'track changes' to reports (p. 44). What has been the impetus for this change and when you do expect these changes will be implemented?

48. Why was there no discussion in the ATSB report of the possibility of 'skip fading' in relation to high frequency (HF) radio transmissions?

49. Why wasn't the entire HF transcript reproduced in the ATSB report?

50. Why doesn't the ATSB report isolate the latest point of safe diversion to Noumea to one particular point in time?

51. Why doesn't the ATSB report mention the fact that neither Auckland or Fiji Air Traffic Control (ATC) passed on to the flight crew the amended forecast for Norfolk Island, after the Norfolk Island Unicom operator had passed this information on to Auckland ATC?

52. What is the relevance of the discussion of TEM (threat and error management) in the ATSB report? (p. 36)

53. In the ATSB investigation, why was a survey done of students regarding en route management and diversion requirements, and not of experienced pilots? (p. 34)

54. Why is there little examination in the ATSB report of the Bureau of Meteorology's role in terms of the quality of weather forecast information available and the reduction in services at Norfolk Island?

SENATE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Inquiry into aviation accident investigations

Written Questions Taken on Notice – Australian Transport Safety Bureau from Public Hearing – Wednesday, 21 November 2012

Written Questions on Notice- Senator Xenophon

1. Your third supplementary submission refuting Mr Davies' analysis is acknowledged, as is Mr Davies' refutation and further explanation.

   (a) Has the ATSB completed a model flight plan for VH-NGA for the ditching flight using the available weather information, including contingencies and potential diversions?

   ATSB response: Yes

   (b) Did the ATSB rely on the CASA fuel analysis that underpinned CASA Accident Liaison and Investigation Unit Accident Investigation Report 09/3?

   ATSB response: No.

   (c) If the ATSB did complete a model flight plan for VH-NGA, was CASA asked to provide the ATSB with an independent fuel analysis for verification of the assumptions and decision rules?

   ATSB response: No.

   (d) Why isn't a model flight plan for VH-NGA included in the analysis section of the report?

   ATSB response: Sufficient information was included in the report to support the findings of the investigation

   (e) Is the factual basis of the ATSB fuel analysis available to the Committee in the papers already supplied?

   ATSB response: Yes. The fuel examination and analysis in support of the investigation findings is in the information provided to the Committee on 12 October 2012 and can be found at SIIMS/ Data documents/03 Operations and meteorology/ FUEL PLANNING/ Depressurised operations planning/ DP fuel plan v2 and, in the case of normal operations, see SIIMS/ Data documents/03 Operations and meteorology/ FUEL PLANNING/en route fuel v2. Subsequently, in response to the submissions to this Inquiry, two additional investigators have independently applied differing methodologies to the flight to verify the initial fuel analysis.

2. In regard to the planning of diversion, either enroute or from the destination, to an alternate airport:

(a) On what aircraft configuration does the ATSB consider diversions should be planned: normal all engines operating or for the most limited contingency configuration?

ATSB response: CAR 234 indicates a number of factors that should be considered in determining whether sufficient fuel and oil is carried for a flight. These include a loss of pressurisation in the aircraft and if the aircraft is multi-engine, an engine failure. The ATSB considers that diversions should be planned at the most limited contingency configuration, consistent with CAR 234 and other provisions affecting a flight (for example, operators may include additional requirements or clarification in their operations manuals – see pages 28 and 29 of investigation report AO-2009-072).

(b) What advice, if any, was requested or otherwise provided by CASA in regard to the most appropriate planning configuration for diversions to alternate airports?

ATSB response: None was specifically requested or provided.

3. In regard to in-flight decision–making:

(a) What advice does the ATSB believe should be given to the aviation community when faced with weather that significantly deteriorates below the original planning basis?

ATSB response: The ATSB believes that it is prudent to:

- plan for contingencies
- monitor fuel usage during flight
- monitor weather forecast/observations
- take the most conservative course of action
- make timely decisions on the most appropriate course of action given the circumstances affecting the flight

(b) Should an aircraft divert when the forecast falls below the alternate minima but not below the landing minima and it is clear that alternate fuel will not be available at the destination?

ATSB response: See 3 (a) response above.

(c) Where should that advice appear?

ATSB response: In the regulations and in any accompanying or associated advisory material.

4. What does the ATSB see as the respective duties imposed by sub-regulations (1) and (2) of CAR 234?

ATSB response:

Sub-regulation 1, ATSB response: This sub-regulation sets the high-level requirement for pilots in command to take reasonable steps to ensure that sufficient fuel and oil is carried to enable safe flight within or to or from Australian territory.

Sub-regulation 2, ATSB response: This sub-regulation establishes the high-level operator responsibility to ensure reasonable steps are taken to ensure its aircraft carry sufficient fuel and oil for safe flight.

5. In regard to the advice provided to pilots:

   (a) Does the ATSB consider that Civil Aviation Advisory Publication (CAAP) 234-1(1) provides adequate and clear advice on individual and shared responsibilities set out in CAR 234?

   ATSB response: Yes.

   (b) Does the ATSB consider that CAAP 234-1(1) provides adequate and clear advice on fuel planning to satisfy the requirements of CAR 234?

   ATSB response: No – seethe safety issue on page 43 and proposed safety action in response on pages 45 to 47 of investigation report AO-2009-072.

6. Did the ATSB form a view about the adequacy of Pel-Air's ditching procedures and CASA's involvement in the formulation of those procedures?

   ATSB response: The operator's ditching procedures and their application by the crew in this case were discussed on page 20 of investigation report AO-2009-072. The ATSB established that, to the extent possible, the crew followed the operator's procedures.

7. Did the ATSB form a view about the adequacy of the safety equipment standards related to the equipment that was used or required for the flight and in the subsequent ditching?

   ATSB response: No safety issue was identified in respect of the adequacy of the safety equipment standards affecting the flight.

8. In regard to emergency procedures:

   (a) Did the ATSB form a view about the adequacy of the emergency procedures and safety equipment training required by Civil Aviation Order (CAO) 20.11?

   ATSB response: No safety issue was identified in respect of the adequacy of the emergency procedures safety equipment training required by CAO 20.11.

   (b) Did the ATSB form a view about the adequacy of the emergency procedures and safety equipment training provided by Pel-Air?

   ATSB response: No safety issue was identified in respect of the crew's training on mandated emergency equipment.

(c) Was each of the pilots compliant with the emergency procedures training requirements?

ATSB response: Yes.

(d) Was or should emergency procedures training have been provided to the medical team?

ATSB response: The ATSB established that the medical staff had previously undertaken Helicopter Underwater Escape Training. The medical staff reported that this training assisted in their escape from the aircraft. The application of the relevant emergency procedures by the medical team to their exit from the aircraft was appropriate in very difficult circumstances (see pages 20 to 23 and 40 of investigation report AO-2009-072).

9. Did the ATSB consider revisiting, reviewing or emphasising its previous recommendation on the classification of aeromedical flights?

ATSB response: The differences in the requirements of CAO 82.0 as they affect passenger-carrying operations and aerial work operations (including aeromedical flights) were highlighted/discussed on pages 26 and 37 of investigation report AO-2009-072. In addition, CASA has advised its intention to regulate air ambulance/patient transfer operations to the same standard as air transport operations (see page 47 of the investigation report and in the ATSB's supplementary submission of 11 November 2012).

10. In regard to the planning of alternates:

(a) Did the ATSB form a view about the adequacy of the CAO 82.0 alternate requirements for remote islands and the exemption of aerial work flights from those requirements?

ATSB response: See the response to question 9 above.

(b) Are there any circumstances where the ATSB considered that a mandatory alternate should not be required for any class of operation?

ATSB response: See the response to question 9 above.

(c) Did the ATSB consider that night operations to remote islands might require special consideration?

ATSB response: See the response to question 9 above.

11. In regard to ATPL theory requirements:

(a) Did the ATSB form a view about the adequacy of the ATPL syllabus to instil all of the required flight planning considerations, both for despatch and in-flight planning, for remote island operations?

ATSB response: No.

(b) Does the ATSB believe that passing the ATPL exams will ensure future competence in all types of operations?

ATSB response: No.

12. In regard to mandatory Training and Checking (T&C):

(a) Did the ATSB form a view about the adequacy of the Training and Checking (T&C) regime provided by Pel-Air to its flight crew in meeting its requirements under Civil Aviation Regulation (CAR) 217 and CAO 82.1?

ATSB response: Yes. On the basis of the crew's training and endorsement records, Pel-Air's training system covered aircraft system knowledge and how to operate and fly the aircraft under normal and abnormal configurations in all approved IFR environments.

(b) Did the scope of the T&C regime extend beyond aircraft emergency and abnormal procedures to broader operational considerations?

ATSB response: Yes, the training and checking regime extended to include flight planning and management, loading and documentation, ATC and other operational aspects, navigation and fuel management and weather appreciation.

(c) If not, did the ATSB form a view that it should?

ATSB response: Not applicable.

(d) Did the ATSB form a view about the adequacy of the training and experience of the T&C staff?

ATSB response: No safety issue was identified in respect of the provision of training or the experience of training staff.

(e) Did the ATSB form a view about the adequacy of the supervision of the T&C staff by CASA?

ATSB response: No.

(f) Did the ATSB form a view about whether the T&C Manual was appropriate for the management of the T&C organisation?

ATSB response: No.

(g) Did Pel-Air have a Command Upgrade training program?

ATSB response: The operations manual included procedures and required standards in support of the conduct and certification of aircraft endorsements and pilot in command checks to line. As indicated on pages 13 and 14 of investigation report AO-2009-072, both crew had completed their aircraft endorsement and the pilot in command his check to line.

(i) If so, did the ATSB form a view about its adequacy?

ATSB response: No safety issue was identified in respect of Pel-Air's command endorsement and check to line procedures.

(ii) If there was no Command Upgrade training program, did the ATSB form a view about the need for such a program?

ATSB response: Not applicable.

13. In regard to fatigue risk management:

(a) What Flight and Duty Times rules was the Pel-Air Fatigue Risk Management System (FRMS) based on?

ATSB response: The operator's FRMS was accepted by CASA. The operator's FRMS manual, which formed Part G of its operations manual, described the relevant fatigue management requirements.

(b) Did the ATSB form a view about the adequacy of the FRMS to manage fatigue risk?

ATSB response: The operator conducted 24-hour operations, and the crew of the accident flight were conducting overnight operations to and from Samoa. It is widely agreed that there will always be some level of fatigue associated with such operations, and that this risk needs to be carefully managed. Early in the investigation, information was obtained from the flight crew regarding the quantity and quality of their sleep in the period leading up to the accident flight (see the response to question 14(a) below). Based on this information, it was concluded that establishing fatigue as a contributing factor was unlikely.

Given this situation, further examination of fatigue management was not covered as part of the ATSB investigation. The ATSB obtained a copy of the operator's FRMS manual but it did not conduct a detailed review of the operator's FRMS.

The judgement regarding whether to include matters that are not contributory in the scope of a safety investigation involves considering a range of factors. In this case, the ATSB was aware that CASA was conducting a review of the operator's FRMS as part of its special audit conducted in November 2009. In addition, the operator advised the ATSB in 11 December 2009 that it had enhanced its fatigue risk management procedures and provided additional fatigue management training to its flight crews. Accordingly, the safety enhancement value of the ATSB considering the issue in its investigation was limited.

(c) Was the FRMS being properly implemented?

ATSB response: As indicated above, a detailed review of the operator's FRMS was not undertaken as part of the ATSB investigation.

(d) Did Pel-Air and CASA have a regular review cycle of the FRMS?

(i) If so, was it effective?

(ii) If not, should it have been in place?

ATSB response: The operator's FRMS manual stated that the system included processes for internal review and ongoing improvement. The ATSB did not obtain any further information associated with the review processes.

14. In regard to fatigue as a factor in the accident, there appears to be a considerable shift in the investigation. In early draft reports, there seems to be no evidence to support the crew's performance being affected by fatigue, but that then shifts to some effect on performance until, in the final report, it is likely to have had some effect:

(a) How did the findings around fatigue develop?

ATSB response: There were no findings regarding fatigue listed in the *FINDINGS* section of any of the draft or final reports. However, in the *FACTUAL INFORMATION* section of the first draft report, it was stated that:

> The balance of evidence does not support the potential for the crew's performance to have been significantly affected by fatigue.

With regards to this statement, the following points are relevant (all times are stated in Sydney time, as this was the local time of the crew prior to conducting the trip. Sydney was UTC + 11 hours):

- The pilot in command was off duty on 13 to 15 November 2009 and was on standby 16 and 17 November. The copilot was not on duty from 14 to 16 November and was on standby 17 November. Neither pilot had conducted any flying activities since 10 November 2009. The pilot in command reported that he had been sleeping well in the days prior to the start of the trip, and the copilot reported that she had been sleeping normally. Accordingly, neither pilot appeared to have any fatigue-related issues prior to commencing the trip.
- The crew were advised of the trip at 2000 Sydney time (0900 UTC) on 17 November 2009, and departed Sydney at 2230. The aircraft landed in Samoa at 0510 (1810 UTC).
- The crew reported that they each had a 'strategic nap', or controlled short sleep period, on the trip from Sydney to Samoa. Such naps, if they met certain conditions such as being less than 30 minutes and being taken during a low workload period, were an approved part of the operator's FRMS.
- The crew had a 10-hour rest break scheduled at Samoa. The hotel was close by, and initially they had breakfast before getting access to their rooms. They therefore had at least 8 hours opportunity for sleep. The pilot in command reported that he slept most of the time during the scheduled break at Samoa, and was well rested (or 'definitely' refreshed). The copilot reported having 5 to 6 hours sleep at Samoa and felt well rested (rating the rest break as 9 out of 10).
- The pilot in command commenced flight planning activities at about 1530 (0430 UTC), and the aircraft departed at 1645. The copilot reported that she could

have been undertaking a strategic nap at about 1900 Sydney time (2000 UTC), which was when a SPECI was provided to the crew by air traffic control.

- The CASA Accident Investigation Report noted that the pilot in command advised CASA that he slept for 4 hours, that his sleep was interrupted by room service and a phone call, and that he did not feel fatigued. This was reported on page 14 of investigation report AO-2009-072.
- In general, people's assessment of their own fatigue level can be unreliable and err on the side of underestimating fatigue, but estimates of the amount of sleep are generally fairly accurate. However, in this case the pilot in command's reported amount of sleep to CASA was inconsistent with the statement provided to the ATSB, wherein the pilot indicated that significantly more than 4 hours sleep was obtained. The ATSB interview with the pilot was conducted on 23 November 2009, and the CASA interview was conducted on about 17 December 2009. Accordingly, the statement made to the ATSB was more contemporaneous and potentially more reliable. Nevertheless, the existence of both statements indicated some doubt regarding how much sleep the pilot in command obtained.
- Fatigue can be influenced by many factors, but primary determinants are the quantity and quality of sleep obtained. It is generally agreed that most people need at least 7 to 8 hours of sleep each day to achieve optimum levels of alertness and performance. A substantial body of research has shown that the quantity and quality of the sleep obtained by people working a night shift is less than that obtained after working day shift. Research into how much sleep people need before performance is affected has produced mixed results. However, there is some consensus that performance is unlikely to be unimpaired when people have less than 5 hours sleep in the previous 24 hours, or 12 hours sleep in the previous 48 hours. When sleep is above these thresholds, any effects on performance, if any, will generally be more subtle. In this case it would appear that the copilot had achieved these prior sleep thresholds, and there was evidence (contemporaneously reported to the ATSB) that the pilot in command had achieved these thresholds.
- In addition to the quantity and quality of sleep, a range of related factors can also influence fatigue such as workload, time of day (or circadian) factors and time awake. In this case, the crew's workload was not significant, at least until the emergency situation was detected. The combination of circadian and time awake factors would not have been significant during the accident flight. In terms of circadian factors and time awake, the highest potential fatigue levels during the trip would have been in the early morning just prior to landing in Samoa and also on the return flight in the early morning hours on 19 November approaching Melbourne.

In summary, the ATSB was aware of the potential fatigue issues associated with such a trip, particularly in terms of the effect of the night operations on the quantity and quality of sleep as well as time awake and circadian factors in some parts of the planned trip. However, the crew appeared to be managing the potential risk by using strategic

naps and taking advantage of their sleep opportunity. There would have been at least minor levels of fatigue immediately prior to and during the accident flight due to the amount of sleep being less than the optimum amount. However, there was insufficient evidence to state that the crew's performance immediately prior to or during the accident flight was significantly impaired by fatigue or that fatigue was a contributing factor to the accident.

Stakeholder feedback from one of the parties to the first directly involved party (DIP) process suggested that the report would benefit from the inclusion of additional discussion of the potential influence of fatigue on the accident. The available information was reviewed and the following addition made to the second draft report:

> The flight crew had a less than ideal rest period in the morning prior to the flight, and they were probably experiencing fatigue at a level that has at least some effect on performance. However, there was insufficient evidence available to determine the level of fatigue, or the extent to which it may have contributed to the crew not comprehending the significance of the 0800 SPECI.

This statement did not contradict the first draft report, as it was still consistent with the crew's performance not to have 'been significantly affected by fatigue' during the accident flight.

In response to the second draft report, one of the DIPs expressed concern regarding the wording of this paragraph, and another party requested the inclusion of additional information. Consequently, the available information was reviewed again, and the following text was included in the final report to provide additional clarification (with all times UTC):

> The flight crew had been awake for over 12 hours before being called on duty at 0900 for the departure from Sydney on the previous day, and they had been awake for over 22 hours when they landed at Samoa. After having breakfast they had about 8 hours opportunity at a hotel for rest prior to returning to the airport. The captain initially reported to the ATSB that he slept for most of this period and was well rested, but later reported to the Civil Aviation Safety Authority (CASA) that he had only about 4 hours sleep but did not feel fatigued. The first officer advised of having 5 to 6 hours sleep and feeling well rested.
>
> Based on this information, it is likely that the flight crew were experiencing a significant level of fatigue on the flight to Samoa, and if the captain only had 4 hours sleep then it is likely he was experiencing fatigue on the return flight at a level likely to have had at least some effect on performance. However, there was insufficient evidence available to determine the level of fatigue, or the extent to which it may have contributed to him not comprehending the significance of the 0800 SPECI.

Although this final text provided additional detail, the ATSB's position regarding fatigue and its potential to influence the performance of the flight crew during the preparation and conduct of the accident flight did not change.

(b) Was there new evidence emerging?

ATSB response: The assessment of the flight crew's fatigue level was based on the crew interviews conducted by the ATSB and the information in the CASA Accident Investigation Report. No additional information was obtained or provided regarding fatigue issues associated with the accident flight after the issue of the first ATSB draft report. The CASA Special Audit Report was obtained by the ATSB prior to the release of the second ATSB draft report, and this document contained information about the operator's FRMS but no information specifically associated with the accident flight.

(c) the report acknowledged that it is likely that the flight crew were experiencing a significant level of fatigue on the flight to Samoa and were likely experiencing fatigue on the return flight:

(i) How did the ATSB reconcile the evidence of disrupted sleep opportunity described in the CASA Accident Investigation Report?

ATSB response: The ATSB stated that '…if the captain only had 4 hours sleep then it is likely he was experiencing fatigue on the return flight at a level likely to have had at least some effect on performance.' As noted above, the pilot in command's report to the ATSB stated that he slept most of the time at Samoa, did not indicate any problems with the sleep obtained, and indicated that he was well rested. The pilot's report to the ATSB was provided 4 days after the accident, and has the potential to be more reliable than that provided to CASA 1 month after the accident. Nevertheless, the existence of both reports provides some doubt regarding how much sleep was actually obtained.

(ii) Why does the report state that there was "insufficient evidence available to determine the level of fatigue or the extent to which it may have contributed to him not comprehending the significance of the 0800 SPECI"?

ATSB response: The statement in the final report that there was 'insufficient evidence to determine the level of fatigue' is based largely on the fact that the pilot in command provided conflicting information to the ATSB and then subsequently to CASA. The uncertainty regarding how much sleep was obtained affected the reliability of any determination of the extent to which fatigue existed.

(d) Was a science-based fatigue study undertaken?

(i) If so, who did it and when?

ATSB response: The ATSB's assessment of the existence and potential contribution of fatigue was conducted by the ATSB's human factors specialists based on the information available, their knowledge of fatigue and relevant literature concerning fatigue.

A bio-mathematical model was not used as part of the ATSB's assessment. As noted in the ATSB's submission to the Inquiry of 11 November 2012, there are limitations associated with such models. It is generally regarded that these models are best used as part of an FRMS to evaluate differences between various rosters, and are inappropriate to use for evaluating the fatigue level of specific individuals. The ATSB assessment of the

crew's potential fatigue levels considered all of the factors that are incorporated into such models.

15. In regard to organisational issues:

    (a) Did the ATSB form a view about the adequacy of the Pel-Air organisation to properly supervise the conduct of all flight operations conducted under their AOC?

    ATSB response: Pilot supervision and support by Pel-Air was discussed in the ATSB's supplementary submission of 11 November 2012 (see pages 3 and 4).

    (b) Was the informal organisation identified by Dominic James (e.g., the preference to bypass the new Chief Pilot in favour of the previous Chief Pilot) explored by the ATSB to determine its true organisational effect on command and control of flight operations?

    ATSB response: Yes.

    (c) Did the informal organisation affect regulatory compliance and safety reporting?

    ATSB response: The Safety Manager did not indicate that the previous chief pilot's approach to the management of the aeromedical operation had affected regulatory compliance. Work was reported underway by the Safety Manager's and incumbent chief pilot to further develop the reporting culture.

16. Did the ATSB form a view about the adequacy of CASA's oversight of Pel-Air in general and the aeromedical flights in particular?

    ATSB response: A review of CASA's audit documentation found that regular, scheduled audits of Pel-Air's documented processes were carried out by CASA in the years preceding the accident. No safety issue was identified in respect of CASA's oversight. No contributing or other safety factors were identified in respect of CASA's oversight of Pel-Air.

17. In regard to hazardous weather alerting:

    (a) Did the ATSB form a view about the adequacy of the procedures for the alerting of flight crew engaged in international flights to significant weather changes at their destination?

    ATSB response: The ATSB assessed the weather products available to the flight crew and did not identify any safety issues in respect of the weather information provided.

    (b) Was any comparison made between Airservices procedures and other nations' air traffic services for hazardous weather alerts?

    ATSB response: No. As advised in the ATSB response to question 19. below, the provision of air traffic services to the flight was from Auckland, Nadi and then Auckland air traffic control respectively (see the depiction of those airspaces at Figure 2 on page 5 of the investigation report). Airservices only involvement with the flight was the receipt and dissemination of the pilot's flight plan.

18. Would the ATSB expect that the subject matter of questions 2-17 above would generate detailed discussion in the report and also form the basis of recommendations for improvement? If not, why not?

ATSB response: These issues were considered as indicated in the previous responses to questions 2 to 17 of these questions and, apart from the minor safety issues as identified in investigation report AO-2009-072, no safety issues were identified.

Reflecting Mr Dolan's evidence to the Committee on 22 October 2012, the ATSB's supplementary submission of 11 November 2012 explained that an ATSB investigation report needs to recognise and meet the non-disclosure requirements of Annex 13 (as set out in paragraph 5.12), as well as the associated 'restricted information' provisions of the *Transport Safety Investigation Act 2003*, while containing sufficient information to support the analysis and findings of the report. The findings in respect of the Norfolk Island accident are at pages 43 and 44 of investigation report AO-2009-072.

The supplementary submission highlighted that the key tasks of investigation are to identify safety issues and to take all reasonable steps to ensure they are responded to. Recommendations are one of a suite of possible ways of bringing safety issues to attention and having them dealt with. The submission also explained Australia's position that overuse tends to devalue the utility of safety recommendations. As a result, our policy is to reserve them as a tool for addressing significant safety issues where the necessary safety action has not been taken.

No significant safety issues were identified during the Norfolk Island investigation. Despite this, safety action by CASA and Pel-Air in response to the two minor safety issues identified as a result of the investigation is reported (see pages 45 to 49 of the investigation report).

19. Airservices on Monday 19 November 2012 gave evidence that there had been no contact with them from the ATSB in regard to the circumstances of the ditching flight. Is that indicative of you concluding that there were no air traffic services considerations to pursue?

ATSB response: As reported on pages 2 and 3 of investigation report AO-2009-072, the pilot contacted Airservices in order to submit his flight plan. During this process, the Airservices officer provided the pilot with the latest aerodrome forecast and advised of other meteorological information. That was the extent of any Airservices involvement in the flight.

Subsequently, and in order to clarify the Airservices evidence, early in its investigation the ATSB did contact Airservices in order to obtain the Airservices recording of the pilot's submission of his flight plan. Elements of that recording are discussed on page 3 of the report. The whole recording is included in the data that has been provided to the Committee and can be located at SIIMS Sharepoint > Aviation > Investigations > AO-2009-072 > DataDocuments > 04 ATS, Aerodrome and facilities>flightplan submission .wma. A transcript of the submission is at SIIMS Sharepoint > Aviation > Investigations >

AO-2009-072 > DataDocuments > 04 ATS, Aerodrome and facilities>Flight planning phone call.pdf.

There were no air traffic service considerations affecting Airservices. The provision of air traffic services to the flight was from Auckland, Nadi and then Auckland air traffic control respectively (see the depiction of those airspaces at Figure 2 on page 5 of the investigation report).

20. What were the frequency, nature and scope of discussions between the investigating team (NOT the management as discussed in Day 1 public evidence) and various levels within CASA?

ATSB response: Beyond routine S32 requests for evidence, DIP reviews and administration, the investigator in charge (IIC) accompanied the managers in the two meetings with CASA in respect of the safety issue concerning the available guidance on fuel planning and applying en route weather updates.

The IIC also phoned and emailed the CASA Accident Liaison and Investigation Unit single point of contact on an as-required, informal basis; covering a wide range of issues across a number of different investigations. Discussions included the progress of a particular investigation and, in about March/April 2010, the IIC was made aware of CASA's differing approach to its investigation of the Norfolk Island accident. CASA's approach to their investigation did not influence the IIC's opinion or management of the ATSB investigation; however, the IIC did consider all proffered arguments.

On request, CASA provided the IIC with a copy of the aerodrome forecasts (TAF) for Nadi and Tontouta after the IIC had inadvertently deleted them from the ATSB safety investigation management system.

21. The following statement is made on page 35 of the final report:

Five different operators were interviewed and provided relevant sections of their operations manuals for review. Those manuals generally reflected the requirements of CAAP 234-1 but also had individual operational requirements appended. However, they either had no guidance, or did not provide consistent guidance on the process to be used when deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island.

At the 22 October hearing Mr McCormick stated:

In the particular case of remote island operations, there are six other operators conducting aeromedical evacuation flights. After the Pel-Air ditching we audited those six. We went and looked to see what they were doing. ***None of those had an issue****. Norfolk Island has been flown to for many years, by Pel-Air as well in various iteration, without there being an issue. But it is a tricky place to fly to, I think we all agree"*

(a) How does the ATSB reconcile the statement in the report with the statement by Mr McCormick?

ATSB response: The ATSB was testing the proposition that, despite the content of CAAP 234-1, current operations manuals did not have clear/sufficient guidance in relation to fuel planning when faced with changing weather conditions while en route. The ATSB's

understanding is that CASA was auditing the operator against the existing standards. This 'testing/auditing' by the two organisations represented different activities.

(b) Who were the five operators the ATSB interviewed?

ATSB response: The names of the operators are available to the Committee in the papers already supplied, and are located at: SIIMS Sharepoint > Aviation > Investigations > AO-2009-072 > DataDocuments > 10 Other > Fuel management behaviour.

22. On what basis did the ATSB amend the far more precise draft report (16 July) from:

Clearer guidance on the in-flight management by crews of previously unforecast, but deteriorating destination weather may have influenced the crew to consider their diversion options earlier, allowing more time for the necessary planning. However, the operator's limited oversight of its aeromedical operation increased the risk that crews would develop their own pre- and in-flight management methods, diminishing the reliability of its own risk controls in such operations.

To the much more generalised final version:

The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not minimise the risks associated with aeromedical operations to remote islands. In addition, clearer guidance on the in-flight management of previously unforecast, but deteriorating, destination weather might have assisted the crew to consider and plan their diversion options earlier.

ATSB response: The amendments were the result of the Commission's consideration of the DIP responses received in the context of the overall investigation and the draft report that was presented for review.

23. In the ATSB's view, what would be the risks and benefits of a possible amendment to the Transport Safety Investigation Act 2003 to make draft ATSB reports and Directly Involved Parties submissions publicly available?

ATSB response: As advised in the ATSB's initial submission of 12 October 2012, effective and open communication with parties involved in a transport safety matter is essential to the ability of any agency to conduct an efficient and effective safety investigation into the matter and to ensure that the necessary safety action is identified and implemented to prevent a recurrence. This is recognised in Annex 13, which includes specific requirements and entitlements for contracting States relating to matters of communication and exchange of information following an aviation accident or serious incident. The Annex also provides for confidentiality provisions in the exchange of certain types of information; recognising that the disclosure of such information may have an adverse effect on future investigations.

The need for draft reports and submissions from directly involved parties to remain confidential is consistent with Annex 13, and is reflected in S26 of the TSI Act. In this respect, the Explanatory Memorandum to the Transport Safety Investigation (Consequential Amendments) Bill 2002 explained that the primary purpose of subclause 26(1) of the TSI Act is to allow appropriate persons that may have influenced the circumstances leading to an occurrence to make submissions in order to confirm or

improve the accuracy of the contents of the report. This consultation and report review process is also important to provide an opportunity for natural justice to parties where there is the likelihood that their interests, rights or legitimate expectations may be adversely affected by the release of a final report.

When draft reports are circulated for this purpose, subclause 26(2) prohibits the recipient disclosing the contents of the draft other than for the purpose of providing a submission to the ATSB, or to take steps remedy a safety issue identified in the report. The prohibition on disclosure protects persons and organisations referred to in the draft report where information about them may be subject to change before the public release of a final report. The information may change because of the need to correct factual inaccuracies or because the analysis and evaluation of contributing and other safety factors has not met the required standard. Where this is found to be the case, the information is removed from the draft to ensure the veracity of the report and that persons and organisations referred to in the report are not unnecessarily subject to adverse inferences in the public domain.

In its response to question on notice 3. HANSARD, PG4 of 12 December 2012, the Office of the Australian Information Commissioner (OAIC) advised that:

> Different purposes are usually served by making a draft report available directly to an involved party, and making a draft more widely and publicly available.
>
> As concerns directly involved parties, the usual reason for making a draft available is to ensure procedural fairness in the preparation of a final report. The doctrine of natural justice requires that a person should be given an opportunity to comment on any adverse finding in a government report before it is finalised. The quality of a draft can also be improved and based on stronger evidentiary findings if people who have knowledge or a direct interest in commenting on a draft report are given an opportunity to do so.
>
> Public dissemination of a draft report is usually done with a view to seeking broader public input to decision making or policy formulation by a government agency. This is in line with the current emphasis on collaboration between government and the community. One of the reform proposals in the *Blueprint for Reform of Australian Government Administration* is 'Creating more open government' by 'Citizens directly communicating their views and expertise to government' and 'Citizens become active participants involved in government'.
>
> If a draft report contains adverse findings about an individual it would generally not be desirable that the draft report is made publicly available before the individual has an opportunity to comment. To publish the draft could undermine the natural justice expectation that the individual should have the opportunity to comment and propose amendment before wider circulation of the draft. However, unless there is any statutory provision to prevent this, the individual may give the draft report to others, particularly to seek advice on their options to respond to the issues presented.

The ATSB's view is that, in terms of natural justice being afforded to directly involved parties, and given that public comment is not sought in respect of its draft reports, S26 of the TSI Act is consistent with the advice from the OAIC above. In terms of the potential for future safety enhancement, the confidentiality provisions of the TSI Act as they affect draft reports and any submissions from directly involved parties ensure that the information in those draft reports, or provided by the parties, will not be taken out of context or misused. As a result, the conduct of that particular investigation or future investigations, and therefore potential for safety enhancement, will not be prejudiced, or the reputations of the respective parties be unnecessarily and unjustly tarnished.

24. Would the ATSB provide an analysis of the number of recommendations and/or identification of critical safety issues contained in all aviation accident investigation reports from 2001 to 2012? This analysis should clearly indicate:

(a) how many recommendations or critical safety issues were made or identified between 2001–2005 and since 2006–2012;

ATSB response: Table 1 at Attachment 1 shows the number of safety recommendations and safety advisory notices (SAN's) issued by the ATSB since 1 January 2001, and the number of safety issues identified since 2007. The numbers are based on the year in which the safety issue was notified to the appropriate organisation to be addressed.

Prior to 2007, a recommendation was generally issued for every safety issue (previously called safety deficiencies) that was identified. Each recommendation was made to the organisation most appropriate to take action. Safety issues identified during this period were not subjected to a risk analysis and so were not categorised as critical, significant or minor. Organisations were encouraged to respond to ATSB recommendations and responses were published on the ATSB website.

Following changes to the Transport Safety Investigation Act (2003) in 2009, Section 25A (2) of The Act requires:

> The person, association or agency to whom the recommendation is made must give a written response to the ATSB, within 90 days of the report being published, that sets out:
>
> (a) whether the person, association or agency accepts the recommendation (in whole or in part); and
>
> (b) if the person, association or agency accepts the recommendation (in whole or in part)—details of any action that the person, association or agency proposes to take to give effect to the recommendation; and
>
> (c) if the person, association or agency does not accept the recommendation (in whole or in part)—the reasons why the person, association or agency does not accept the recommendation (in whole or in part).

Since 2007, safety issues have been identified and notified to the appropriate agency (including CASA, Airservices Australia, operators, manufacturers and other organisations) during the course of an ATSB investigation with the expectation that stakeholders will pro-actively address the issues in a timely manner so that safety is improved prior to the publication of the ATSB's final report. All proactive safety actions taken by agencies are published in the ATSB report. Should safety issues not be addressed to the ATSB's satisfaction, then the ATSB may still issue a recommendation. This process is outlined on page 24 of the ATSB's original submission to the Senate Inquiry and the supplementary submission of 11 Nov 2012.

The numbers of proactive safety actions that have been taken in response to safety issues are also provided in the attached Table 1 (from 2007 onwards). It is important to note that the total number of safety actions taken has increased since the change in process.

(b) if there has been a decrease in the number of recommendations or critical safety issues since 2005, please explain why this has been the case;

ATSB response: As previously advised on page 24 of the ATSB's original submission to the Senate Inquiry and the supplementary submission of 11 November 2012, the ATSB prefers to encourage proactive safety action by organisations to address safety issues identified in investigations, rather than issuing prescriptive recommendations. Time and experience has shown that after a safety issue is identified, the appropriate organisation is generally in a better position to develop appropriate safety action to address safety issues specific to their organisation. As a result, proactive safety actions tend to result in more rapid and targeted improvements in policies, procedures, training or systems to address safety issues in order to reduce risk to future operations.

Consistent with the ATSB's philosophy of encouraging proactive safety action in response to identified safety issues, the great majority of safety actions taken to address all identified safety issues in the last five years were initiated by stakeholders (including CASA and Airservices Australia) rather than in response to prescriptive recommendations by the ATSB.

Tables 1 and Table 2 at Attachment 1 show that, during the period 2001 to 2005, the ATSB issued 243 safety recommendations, of which 185 were addressed to the satisfaction of the ATSB. During the period 2006 to 2012, the ATSB issued 61 recommendations, of which 40 were addressed to the satisfaction of the ATSB. However, there were a total of 370 pro-active safety actions taken by stakeholders in response to identified safety issues during the same period, and 13 safety advisory notices (SAN's) issued by the ATSB to industry, so the total safety improvements (40 + 370 +13) is 423. In addition to that, the ATSB reported an additional 297 safety actions not linked to safety issues during the period 2006-2012.

(c) how many recommendations or critical safety issues have been made or identified specifically to CASA and to Airservices Australia regarding improvements to aviation safety arising from aviation accident investigations;

ATSB response: Table 3 at Attachment 1 gives the number of safety issues identified in all types of aviation investigations since 1 January 2001 which related specifically to CASA and Airservices Australia, and the number of recommendations issued by the ATSB.

(d) what proportion of recommendations or critical safety issues specific to CASA and to Airservices Australia were made or identified between 2001–2005 and since 2006–2012;

ATSB response: Table 4 at Attachment 1 gives the proportion of all safety issues identified (and recommendations made) in all types of aviation investigations since 1 January 2001 which related specifically to CASA and Airservices Australia.

(e) what the response to each recommendation or critical safety issue specific to CASA and to Airservices Australia has been;

ATSB response: Table 5 (Excel file provided electronically to Committee Secretariat) details all responses by CASA and Airservices Australia related to safety issues identified by the ATSB and Table 6 details all responses to ATSB recommendations issued to those organisations. It should be noted that the ATSB does not require organisations to formally respond to minor safety issues, though all responses to minor safety issues are included.

(f) what action has been taken to address each recommendation or critical safety issue; and

ATSB response: See Tables 5 and 6 (Excel file provided electronically to Committee Secretariat).

The ATSB has made improvements to the way safety risks (and the appropriateness of actions taken to address them) are assessed. Since 2007, the ATSB has conducted a risk assessment of each safety issue identified in an investigation. Safety issues are classified as critical, significant, or minor risk, based on their potential consequence and likelihood to increase risk into the future.

Critical and significant safety issues communicated to organisations are required to be addressed to the satisfaction of the ATSB. Each proposed safety action is assessed by the ATSB in terms of how it will reduce the risk of the safety issue to an acceptable level. Should the ATSB not be satisfied that the actions taken will sufficiently reduce risk, then the ATSB will seek further action or may decide to issue a formal safety recommendation. All safety actions taken by organisations, including responses to safety recommendations will be reported in the ATSB's final investigation report, which is published on the ATSB's website.

The Portfolio Budget Statement for the ATSB specifies as two of the ATSB's key performance indicators (KPI's) that in the 2011-12 and subsequent financial years:

- Safety action is taken by stakeholders to address 100 per cent of critical safety issues identified.
- Safety action is taken by stakeholders to address 70 per cent of significant safety issues identified.

In FY 2011-12, there were no critical safety issues identified and 89% of all significant safety issues identified were adequately addressed.

As is the case for other safety agencies overseas (including the US NTSB), the ATSB has no legislated powers to mandate compliance with or the taking of specific actions in regard to an identified safety issue or ATSB safety recommendation.

(g) the time taken to respond and to act on each recommendation or critical safety issue.

ATSB response: All responses by CASA and Airservices Australia related to each recommendation and safety issue (critical, significant, and minor) specific to those organisations are presented in Tables 5 and 6 (Excel file provided electronically to Committee Secretariat).

For each recommendation or safety issue, the document specifies when the safety issue was advised to CASA or Airservices Australia.

For safety issues and recommendations released before 2007, correspondence relating to a safety action is listed separately, along with the date it was received, and the summary of that safety action. In some cases, there are several items of correspondence with the ATSB to describe intended safety actions, though the time reported to address the safety issue is based only on the presentation of evidence indicating that appropriate safety action had been taken.

For safety issues and recommendations released after 2007, only the date on which the ATSB determined that the safety issue had been adequately addressed is available. A summary of the safety action taken to address the safety issue is also provided. The time taken by the organisation to respond to the ATSB is not recorded.

As many safety actions taken in response to safety issues are proactively taken by organisations, in many cases, they have been addressed before the ATSB has completed its investigation. These cases are detailed in column E of the tables.

25. Documentation indicates a s32 request was made on 4 July 2012 for the CASA Special Audit. When was the audit sent by CASA? When did it arrive? The committee is aware of the fact that the ATSB knew about the CASA Special Audit when the audit was announced. That being the case, why did the ATSB wait for over two years to request it? Your supplementary submission (annex), which covers where the special audit was included in the ATSB report, appears to come from the March version of the report. Is that the case? How can the ATSB report refer to the Special Audit in the March 2012 draft when it appears the ATSB were not yet in possession of it?

ATSB response: As advised in its 14 December 2012 response to the Committee's questions on notice of 21 November 2012, the ATSB requested a copy of the CASA Special Audit Report under a S32 notice on 4 July 2012. A copy of the special audit was received by the ATSB on 9 July 2012.

As part of its investigations, the ATSB has not routinely obtained CASA Special Audits. As an independent investigation agency, the ATSB focuses on obtaining its own evidence in consideration of its evolving investigation hypotheses, and in support of its analysis and findings. This need not include the results of investigations or other activities that may be undertaken by other agencies for their own purposes. The decision of whether to obtain such outputs by other agencies would generally be informed by the evidence already gained by the ATSB's investigation, and the perceived benefits of obtaining them.

Appendix A to the ATSB's supplementary submission of 19 October 2012 compared the content of investigation report AO-2009-072 that was released to the public on 30 August 2012 against the relevant areas of the CASA Special Audit. The aim was to highlight that the ATSB had considered the relevant factual information in the special audit, and to show the results of that examination in terms of the content of the final investigation report.

Attachment 2 to the present questions on notice includes the same table as appended to the 19 October 2012 submission, but also indicates (in square brackets) where the relevant factual information from the special audit was already addressed in the 26 March 2012 draft report. That was, these facts had been established by the ATSB's investigation before the receipt of the special audit.

Separately, and as advised on 14 December 2012, on 15 June 2010 the ATSB received an email from Pel-Air detailing safety action undertaken by the company in response to the special audit. The actions were detailed in a Pel-Air three-stage Management Action Plan (MAP). Pel-Air advised of the completion as at 2 June 2010 of the following elements of the MAP:

- Phase One – 26 items were completed between 20 November 2009 and 17 January 2010 prior to the resumption of domestic operations.
- Phase Two – 11 items were completed between 1 December 2009 and 21 December 2009 prior to resuming international operations.
- Phase Three – 14 items were completed between 14 December 2009 and 1 April 2010, with 6 items ongoing and scheduled for completion by 30 June 2010.

The safety action reported in the draft report as taken by Pel-Air in response to the identified safety issue was based on Pel-Air's email advice of 15 June 2010.

26. What are the normal processes around requesting CASA special audits? If the ATSB report was approved for public release on 16 July as indicated in the ATSB submission, was there sufficient time to consider the findings of the CASA special audit if it was not formally requested until 4 July?

ATSB response: See the response to questions 25 above and 33 below. The ATSB report was approved for public release under S25 of the TSI Act on 16 August 2012. Receipt of the CASA special audit on 9 July 2012 allowed for sufficient time for its review before the draft final report was forwarded to the Commission on 30 July 2012 for approval for release under S25 (see the response to question 25 above for an indication of the scope of that review).

27. From documentation, it appears that on 5 July 2011 a safety issue was provided to CASA which stated: Safe fuel management systems for use on long flights are not universally implemented in Australian charter and airwork operations. [Significant safety issue]. How does that work through to the final report to become a minor safety issue which appears to be slightly different? (p.43)

ATSB response: The following response to this question was provided to the Committee Secretariat on 14 December 2012:

> Early in the investigation, initial information indicated that there was a safety issue and the ATSB wrote to CASA about that issue. Subsequently, CASA brought additional information to the attention of the ATSB that they believed mitigated the level of risk associated with the safety issue. Additionally, during the interim period, the ATSB was gaining a better understanding of the interaction of the individuals/organisations involved. As the investigation and report underwent reviews within the ATSB the safety issue remained open. The day the Commission approved s25 release of the final report, on 16 August 2012, was when the safety issue was formally re-classified as a minor safety issue.

The 5 July 2011 correspondence with CASA was a 'safety issue briefing sheet', the provision of which is standard practice to alert CASA (or other parties) of a potential/evolving safety issue and to elicit feedback/discussion. Any indication of safety action in response to an identified safety issue is included in a final investigation report.

28. From documentation, it appears that on 5 July 2011 a safety issue was sent to the operator which stated: The operator did not provide the crew with the training or oversight to assure that the crew would flight plan to meet fuel requirements for abnormal operations as prescribed in the company operations manual [minor safety issue]. How does that work through to the final report of a minor safety issue which appears to be different? (p.43)

ATSB response: The advice to Pel-Air and consideration of a potential/evolving safety issue reflects the same approach as taken with CASA above (see the ATSB response to question 27 above). The final text of the safety issue was approved by the Commission in accordance with S25 of the TSI Act on 16 August 2012.

29. Given the number of actions required of the operator as a result of the CASA special audit, which included RCAs and voluntarily ceasing operations, would the ATSB please explain how this is classified as a minor safety issue?

ATSB response: As indicated in the response to question 25 above, Appendix A to the ATSB's supplementary submission of 19 October 2012 compared the content of investigation report AO-2009-072 that was released to the public on 30 August 2012 against the relevant areas of the CASA Special Audit. The attachment to the present questions on notice includes the same table, but also indicates (in square brackets) where the relevant factual information from the special audit was already addressed in the 26 March 2012 draft report.

That was, sufficient facts were established by the ATSB's investigation in support of the identified safety issue before the receipt of the special audit. The classification of the safety issue was determined in accordance the ATSB's analysis methodology.

30. In a minute from CASA dated 27 April 2012, CASA suggests that it might be helpful to note the lifejacket manufacturer and model and the time of the rescue, as the survivors reported that

by the time they were rescued most of the life jacket lights had stopped working. Why was this issue not highlighted in the final report? Was there discussion of this with CASA?

ATSB response: CASA's DIP comments were considered in accordance with the ATSB's normal procedures. The availability of the life jacket lights after the ditching is at page 24 of investigation report AO-2009-072. While the name of the manufacturer of the life jackets may be of note to CASA from a regulatory/compliance standpoint, it was not generic to the development of the accident or relevant to the findings of the report and so was not included in the report. In respect of the serviceability of the life jackets, see the response to question 34 below.

There was no discussion with CASA in this respect.

31. It seems that a major rewrite of the report was undertaken by ATSB officer 1 with assistance from ATSB officer 2 and ATSB officer 3 around July/August 2011, and that this took a different view to the IIC. Management appeared to favour the individual over the systemic emphasis. Given the IIC had a more detailed knowledge of the facts, how does the ATSB justify the removal of contributing safety factors from the report?

ATSB response: Peer and management review are important elements in the development of draft and final reports. This includes the review of the evidence in support of any findings and, in the case of draft *Contributing safety factors*, confirmation of their contribution.

As highlighted in the ATSB's initial submission of 12 October 2012, the ATSB's analysis methodology determines 'contribution' in terms of the 'existence' and 'influence' of the safety factor and of the standard of proof as to their probable contribution. With respect to this standard, 'probably' is defined as being equivalent to 'likely', and meaning more than 66% likelihood. An *Other safety factor* is a safety factor that did not meet the contributing safety factor definition, but was still considered to be important to communicate in an investigation report in the interests of improved transport safety.

In regard to the draft contributory safety factors as presented in the initial draft of investigation report AO-2009-072, one was more correctly an *Other key finding* and was moved to that section of the report findings as a result. This other key finding identified that, at the time of flight planning, there were no weather or other requirements that required the nomination of an alternate aerodrome or carriage of additional fuel to reach an alternate.

Of the remaining draft contributing safety factors, two related to the risk of inconsistent in-flight fuel management and decisions to divert in the case of deteriorating destination weather and were combined. This finding is the first of the other safety factors in final investigation report AO-2009-072 and refers to the general nature of the available guidance on fuel planning and on seeking and applying en route weather updates. The last draft contributory factor related to the operator's procedures for the management of deteriorating weather, and is encapsulated in the second of the other safety factors in the final investigation report.

The evidence in support of the draft contributory safety factors was found not to have proven influence in either case. The importance, however of these factors to the improvement of transport safety resulted in their retention in the final report as other safety factors.

32. At the 21 November 2012 hearing Mr Dolan mentioned going beyond the Reason model. What methodology are you now using and what research is it based on? Is this new methodology internationally recognised? How is it diluting the influence of the investigator? Does it differ from the Reason model?

ATSB response to the question 'What methodology are you using now?': The ATSB's investigation analysis methodology was summarised in the ATSB's initial submission on 12 October 2012 (Sub03_ATSB, parts 2 and 3). The methodology is also discussed in more detail in the following papers:

- Walker, MB 2007, 'Improving the quality of investigation analysis', *ISASI Forum*, January-March 2007.
- Walker, MB & Bills, KM 2008, 'Analysis, causality and proof in safety investigations', *Aviation Research and Analysis Report AR-2007-053*, Australian Transport Safety Bureau.
- Walker, MB 2009, 'Causation: What is it, and does it really matter?', *ISASI Forum*, April-June 2009.

The Reason model of organisational accidents, commonly known as 'the Reason model', is not an investigation method. It is a model that describes some of the types of factors than can contribute to an accident. The model has been very important in safety because it emphasises the importance of the systemic or organisational contributions to accidents, and it has become widely known.

An analysis methodology needs much more than an accident development model. Accordingly, the ATSB analysis methodology includes elements such as definitions of key safety-related terms, guidelines for critical reasoning, and structured processes for organising evidence, identifying safety factor hypotheses, defining and testing safety factor hypotheses, and assessing the importance or risk of those safety factors that are safety issues. The ATSB is not aware of any other analysis framework that systematically addresses all of these elements.

The ATSB methodology includes an accident development model to help identify safety factor hypotheses. This model is based on the Reason model (see the response to the question 'How does it differ from the Reason model?' below, see also Part 3 of the ATSB's initial submission to the Committee of 12 October 2012, and in particular the section on 'The analysis model' starting on page 12).

ATSB response to the question 'What research is it [the ATSB methodology] based on?': In addition to the significant experience of its own investigators, the ATSB analysis methodology was based on the following activities:

- An extensive review of the literature in areas such as investigation analysis methods, causation, standard of proof and critical reasoning.
- Discussions with representatives from many investigation agencies, such as the Transportation Safety Board of Canada, the US National Transportation Safety Board, the New Zealand Transport Accident Investigation Commission and the UK Aircraft Accident Investigation Branch.
- Presentation of a draft analysis framework and related concepts at several industry forums and conferences on the ATSB's proposals, and feedback received from these presentations.

Most of this research was conducted between 2004 and 2006 as part of the ATSB's process to replace its occurrence database with the Safety Investigation Information Management System (SIIMS). As noted in Walker and Bills (2008):

> As part of the SIIMS project, the ATSB initially reviewed existing analysis frameworks and methods applicable to safety investigation. None of these were found to meet the ATSB's needs. Common limitations included:
>
> - applicability to a narrow domain (for example, aircraft maintenance)
> - focus on a limited part of the analysis process
> - lack of flexibility to handle novel situations
> - lack of flexibility to deal with both small and major investigations
> - lack of guidance material about the process.
>
> In addition, the review identified that there was minimal commonality in the terms, models, and processes used by various safety investigation organisations.
>
> Consequently, the ATSB developed its own analysis framework, borrowing useful ideas from its existing processes and other organisations where appropriate, but also substantially adding to this material in many areas. The ultimate aims of the ATSB investigation analysis framework were to improve the rigour, consistency and defensibility of investigation analysis activities, and improve the ability of investigators to identify safety issues in the transportation system.

ATSB response to the question 'Is this new methodology internationally recognised?': The ATSB's analysis methodology is based on best-practice elements, where any exist, from a range of different fields. The methodology has also been presented at several industry forums and conferences, both in Australia and overseas. Informal feedback from other organisations and investigators has generally been very positive.

The first significant investigation undertaken using the new analysis methodology was the ATSB's investigation of the fatal Metro 23 accident near Lockhart River, Queensland on 7 May 2005 (ATSB investigation 200501977). Following the completion of this investigation, there was some criticism of aspects of the ATSB's methodology by the Civil Aviation Safety Authority regarding the ATSB's use of a Reason-type model and the ATSB's definition of 'contributing safety factor', and the Queensland State Coroner had concerns regarding the description of the standard of proof associated with the ATSB's definition of 'contributing safety factor'. The Walker and Bills 2008 paper provided a

detailed description of these aspects of the ATSB's framework and their rationale. The draft of the paper was initially reviewed by external safety and legal experts, and a second draft was publicly released as a discussion paper. During these processes, no notable concerns were raised about the ATSB's analysis methodology.

ATSB response to the question 'Is it [the ATSB methodology] diluting the influence of the investigator?: This question's use of 'the investigator' can be interpreted as referring to individual investigators within the ATSB, or the ATSB as a whole. Both interpretations are discussed below. In both cases the answer is no.

In terms of individual investigators, safety investigations require analysis of complex sets of data and situations where the available data can be vague, incomplete and misleading. There are no detailed, prescriptive rules that can be applied in all situations and provide guaranteed success, and analysis activities ultimately rely on the judgement of safety investigators. Analysis has been a neglected area in terms of standards, guidance and training of investigators in most organisations that conduct safety investigations, and the ATSB developed its comprehensive analysis methodology to address this situation. The methodology was designed to guide and support investigator judgements, rather than replace the central role of its investigators.

The ATSB analysis methodology does place a strong emphasis on teamwork. Investigators have excellent skills and knowledge of particular domains, but it is unlikely that any one investigator will have sufficient knowledge in all relevant domains to deal with the complexity that arises during investigations. As the range of experience that contributes to analysis judgements is broadened, then the quality of the resulting findings will improve.

In summary, individual investigators still have the same potential for influencing the scope and content of investigations as before. However, there is a much greater emphasis on ensuring that investigators use a comprehensive process to identify potential safety factors, and that the findings of ATSB investigations are supported by sufficient evidence and arguments.

In terms of the ATSB as a whole, the ATSB believes that having an analysis methodology that improves the rigour, consistency and defensibility of its investigation analysis activities, and improves the ability of investigators to identify safety issues in the transportation system, enhances the ATSB's roles in the Australian transport safety system.

ATSB response to the question 'How does it differ from the Reason model?': As noted above, the Reason model is not an investigation method. An investigation method needs much more than an accident development model, and the ATSB analysis methodology provides these additional elements.

In terms of the model itself, the ATSB analysis framework includes an accident development model (termed the 'investigation analysis model') that is largely based on the Reason model, but it has been adapted to better suit the purposes of a safety

investigation. The differences between the Reason model and the ATSB investigation analysis model were discussed in the ATSB submission of 12 October 2012 (Sub03_ATSB, part 3), and are summarised in more detail in Walker and Bills 2008 (section 3). Very briefly, the main enhancements of the ATSB model include:

- Replacing 'defences' with 'risk controls', and using this term to refer to a broader range of conditions than was the case in many versions of the Reason model. This change helps emphasise the importance of both preventive and recovery risk controls, and it helps integrate the model with modern risk management concepts.
- Placing greater emphasis on the distinction between the measures an organisation puts in place at the operational level to minimise risk (that is, risk controls such as procedures and training) and the aspects of an organisation that influence the effectiveness of these risk controls (that is, organisational influences such as hazard identification and training needs analysis).
- Incorporating technical failures into the model, and thereby enabling the analysis of such failures to be better integrated with other safety factors rather than just focussing on the human and organisational factors.

These changes were introduced because of difficulties that investigation teams had in applying some elements of the Reason model during complex investigations during the 1990s. The ATSB model (with different terminology) was first used in the ATSB investigation report 19904538 (Boeing 747-400 runway overrun at Bangkok, 23 September 1999). The model has been modified slightly over subsequent years, and been used in many other investigations, most notably the Lockhart River Metro 23 investigation. The ATSB is still using the same accident development model as part of its investigation analysis methodology for its current investigations.

In terms of the Reason model, and similar models such as that used by the ATSB, it is worth noting the following:

- Although the Reason model is widely discussed in the safety literature, this type of model is not widely used by safety investigation agencies as an integral part of their investigation methodology. The ATSB probably uses this type of a model to help guide its investigation analysis activities more than any other equivalent investigation agency.
- There have been criticisms of the suitability of the Reason model for safety investigation. These criticisms include suggestions that that model has encouraged too much focus on organisational issues and not enough focus on individual issues, and that the model is not sophisticated enough to describe the complexity of modern accidents in high reliability industries (discussed in Walker and Bills 2008, section 6). Although caution is required when using a systemic model such as the Reason model, the ATSB believes these criticisms do not have strong merit, and that an accident development model based on the Reason model has an important role to play in helping guide investigation analysis activities.

33. According to the ATSB submission (p. 43), on 16 July 2012, the second draft report was released to DIPs with comments due 26 July 2012. Also on 16 July 2012, the final report was approved by the Commission for release to the public under section 25 of the TSI Act. Could you please explain how and why the final report was approved by the Commission prior to the closing date for DIP comments?

ATSB response: The second DIP period took place over the period 16 to 26 July 2012. The draft final report was forwarded to the Commission for approval for release under S25 of the TSI Act 2003 on 30 July 2012. Subject to the resolution of a number of queries by the Commission, the report was approved for release to the public on 16 August 2012.

The reference to the Commission approving the release of the report under S25 of the TSI Act on 16 July 2012 on page 43 of the initial ATSB submission is a typographical error, and should read 16 August 2012.

34. Did the ATSB check the servicing history of the lifejackets? Why did you not make a recommendation that lifejackets be checked?

ATSB response: A review of the aircraft's maintenance documentation showed that the aircraft underwent a routine 200-hourly inspection from 29 October to 6 November 2009. In respect of the aircraft's life jackets, one life jacket was installed in the aircraft during that service with a shelf life expiry date of 31 March 2013. In addition, the aircraft's daily inspection records showed signatures certifying the checking of the aircraft's life jackets, with no anomalies recorded. In conjunction, this indicated that the life jackets were being maintained as part of the normal aircraft maintenance procedures. There was no evidence to suggest that there were any pre-existing deficiencies with the aircraft's life jackets.

Given the above, no safety factor and therefore issue was identified in respect of the servicing of the aircraft's life jackets. As previously advised, Australia's policy is to reserve the issuing of safety recommendations as a tool for addressing significant safety issues where the necessary safety action has not been taken. As no safety issue was identified in respect of servicing the life jackets, the pursuit of safety action, including the possible issuing of a safety recommendation, was not called for in that regard.

35. If the life-raft was improperly placed in the aisle un-secured, should it be a Safety Recommendation to CASA and Operators to check this SOP in their manuals?

ATSB response: In respect of an aircraft evacuation after a successful ditching, the Pel-Air operations manual indicated that any life rafts should be removed from their stowage and placed near window exits after the aircraft has come to rest.

The ATSB's supplementary submission of 11 November 2012 explained that the life rafts were removed from their normal storage position by a rear-seat occupant and placed in the aircraft's central aisle ready for deployment after the ditching. Of note, priority was reported given to assisting the patient from the aircraft, rather than deploying the life raft.

The supplementary submission also highlighted that the key tasks of investigation are to identify safety issues and to take all reasonable steps to ensure they are responded to. Recommendations are one of a suite of possible ways of bringing safety issues to attention and having them dealt with. Australia's position that overuse tends to devalue the currency of safety recommendations. As a result, our policy is to reserve them as a tool for addressing significant safety issues where the necessary safety action has not been taken.

The action in this case of placing the life rafts in the aisle was consistent with the lack of identification of a safety issue, and therefore need for safety action - such as issuing a recommendation in respect of their removal from the stowage. As discussed in the ATSB's supplementary submission, there are advantages and disadvantages associated with this action. Access to the life rafts may be more readily available from a position in the central aisle; however, in anything but a low energy impact with the water, it could be expected a life raft might move/dislodge from that position.

36. Why is the lack of up to date emergency training not mentioned in the factual evidence and analysis? It appears that the wet drills training had expired for the flight crew. How would a reader know this?

ATSB response: In respect of the crew member emergency procedure proficiency requirements of CAO 20.11 refer to the response at question 8(c) above.

In regards to 'wet drill' training, Part D, sections 3.2.12(e) and (f) of the Pel-Air operations manual indicate that this training shall take place as part of a pilot's initial qualification with the company. In addition, the manual stated that recurrent life raft training may be carried out using a step-by-step pictorial checklist or via a practical scenario. There was no mandated 'wet drill' currency requirement.

The crew's wet drill training was recorded at pages 13 and 14 of investigation report AO-2009-072. The reported benefits of the crew having undertaken this training were highlighted on page 20, discussed on pages 40 and 41 and recorded as an *Other key finding* on page 43 of the report.

37. On page 32 of the final report what does the following sentence mean? Does it mean it did not occur, or does it mean that the ATSB can't establish the facts?

'There was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crews' compliance with the operator's procedures.'

ATSB response: The sentence above means that the ATSB could not establish the facts.

Could that paragraph be reworded in the following way to reflect the findings of the CASA special audit?

"There was evidence that indicated the operator did not routinely assure itself of the accuracy of the pilots international flight planning and forms or their in-flight management logs and crews' compliance with the operator's procedures".

ATSB response: Since the ATSB could not establish the facts, it would not be appropriate to re-word the paragraph as proposed.

38. Can you please explain the following change from the drafts to the final report and what evidence resulted in the change? In the final report is the ATSB stating that they cannot find the evidence, or is the ATSB stating that the logs were not filled out correctly? The CASA Special Audit found the operator did not complete the in-flight navigation logs. Why is this not written in plain, unambiguous language as per the ICAO Accident Manual requirements?
26 March 2012 draft:

There was no evidence in the operator's training file for the PIC to suggest the completion of that additional training during his post-endorsement training.

Final:

There was no requirement in the operations manual for the content of such training to be recorded. The Australian Transport Safety Bureau (ATSB) was unable to independently confirm the extent of the PIC's post-endorsement training.

ATSB response: Many operators develop checklist-style forms in support of their training. These forms list a number of exercises that might be undertaken in a particular flight and include a matrix that allows the trainer to annotate 'satisfactory', 'unsatisfactory', 'waived' or similar. There can also be a second element to such forms where the trainer makes manuscript observations on the conduct of the training flight, notes the exercises undertaken, and comments on/provides advice on any issues and where or how the trainee might improve performance in the future. Not all elements of an exercise covered during a flight are necessarily recorded on a form and trainers will often revert to more general comments and observations. This is not unusual.

The intent of the draft report was to highlight the requirements in the operations manual for specified post-endorsement training, such as the calculation, application and/or adjustment of CPs and PNRs, etc that had relevance to the accident. There was no evidence in the pilot's training records that these items were specifically addressed in his training.

However, as a result of the initial DIP process, the pilot's training records were again reviewed and a comment by the trainer for the pilot's first post-endorsement training flight was found indicating that 'We went through flight planning, and re-flight planning for bad weather'. There was no clarification as to what specifically that exercise may have entailed, which prevented a full understanding from the training records of the extent of these aspects of the pilot's post-endorsement training. This was the reason for the revised text in the final report. It was not related to the completion or otherwise of the in-flight navigation logs.

From 16 July draft

Flight crews were expected to use their own methods, systems and tools for pre-flight planning. It was reported that copilots modified their techniques to reflect the preferred methods for each PIC with whom they flew.

Final

"Flight crews were expected to use their own methods, systems and tools for pre-flight planning in compliance with the provisions of the operations manual. It was reported that copilots modified their techniques to reflect the preferred methods for each PIC with whom they flew. ***There was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crews' compliance with the operator's procedures.***

ATSB response: In the first instance, and similar to most transport safety investigation agencies, the ATSB seeks independent evidence in the form of documentary, physical, recorded, etc data in preference to anecdotal evidence, such as (for example) witness recollection. The highlighted text was included subsequent to the DIP process to indicate the lack of such independent evidence.

The additional text supported the discussion at page 38 of the report on the oversight difficulty faced by the operator as a result of the variation in its pilots' pre-flight planning procedures. The ensuing analysis highlighted the potential safety benefits (including potentially for other operators) of the closer review of flight documentation and how it was being applied. In the Pel-Air aeromedical operation, this included an increased likelihood of the identification of the inconsistent interpretation and application of elements of the operations manual in respect of fuel management.

The change to the text was not related to the completion or otherwise of the in-flight navigation logs.

39. Why were the following paragraphs removed from the 16 July 2012 draft of the report? What evidence was presented to the ATSB to remove this criticism of the operator?

"However, the operator's expectation that pilots would use their own methods, systems and tools for pre-flight planning had the potential to dilute those regulatory and procedural requirements as risk controls. To some extent, this might explain the pilot in command's (PIC) actions to develop the flight plan for the flight to Norfolk Island by reversing his outbound flight plan to Apia and applying the previously-experienced upper winds and NOTAMs to his planning for the return flight via Norfolk Island.

Similarly, by not specifically requiring the copilot to partake in the flight planning, and not overtly following the flight or ensuring the availability of operational and communications support at Apia, the operator precluded these additional potential safety defences from having effect. Together with the operator's normal process of not requiring crews to report to the operator if a flight was progressing satisfactorily, this would have increased the isolation felt by its crews, and prevented a full understanding by the operator of the residual risk affecting a flight"

ATSB response: These paragraphs were part of the analysis section of that draft report and developed the argument in support of the draft finding in respect of Pel-Air's oversight of the aeromedical operation and flight planning guidance (see the draft findings at page 53 of the draft report). As indicated in the responses to question 28 above, the final text of the safety issue affecting Pel-Air was approved by the Commission in accordance with S25 of the TSI Act on 16 August 2012.

As part of its approval process, the Commission reviews the evidence in support of any draft findings. In this instance, the Commission felt that there was insufficient evidence to support the finding as drafted. In consequence, the above paragraphs were removed from the analysis section of the report and the finding changed to that seen in the final report (see the ATSB response to question 41 below).

40. What does the following mean? Why is it written in language that is not clear? Did the operator conduct post-endorsement training or ongoing proficiency checks as required by the operators manual?

However, in the absence of any independent record of post-endorsement training or proficiency checks of that knowledge, the ATSB was unable to independently determine the PIC's ongoing exposure to, and application of those requirements in the Westwind. Clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions.

ATSB response: The above quote should be examined in terms of the preceding discussion in investigation report AO-2009-072 of the need for pilots to make in-flight weather-related decisions that are based on the most recent weather and other information relevant to a flight. The importance of a pilot's knowledge as a result of his or her Airline Transport Pilot (Aeroplane) Licence qualification was discussed. The requirement in the Pel-Air operations manual for post-endorsement training or proficiency checks of that and other knowledge was highlighted in the factual section of the investigation report. This included checks of the calculation, application and/or adjustment of CPs and PNRs in support of weather-related decisions.

As discussed in the response to question 38 above, the only documented (independent) evidence of such training being provided to the pilot in command was a general comment by the trainer in the pilot's first post-endorsement training flight, indicating that 'We went through flight planning, and re-flight planning for bad weather'. There was no specific indication of what that may have entailed, which prevented a full understanding of the extent of these aspects of the pilot's post-endorsement training.

The second sentence draws from the specifics of this accident to make a more general point in respect of the benefits for all pilots of clear and readily available guidance in respect of seeking and applying en route weather and other information to their flights. Such guidance would serve as a ready information source, allow pilots to self-study in preparation for a flight or check flight, assist operators in the development of their operations manuals and training packages and, overall, increase the likelihood of consistent and appropriate in-flight operational decisions.

As a result of this accident, CASA has advised of safety action that will:

- Enhance the available fuel-planning and in-flight decision making guidance in respect of flights to remote destinations.
- Carry out a holistic review of the fuel and alternate planning guidelines.

Given the nature of the Pel-Air training and proficiency records as highlighted at pages 14 and 32 of the investigation report, the available evidence of the flight crew's training indicated that Pel-Air was conducting post-endorsement training and ongoing proficiency checks as required by the operations manual.

41. Please explain the following change. What evidence was received?

Draft (16 July):

The operator's limited oversight of the aeromedical operation and flight planning guidance prevented a full understanding by the operator of the residual risk affecting the operation. [Minor safety issue]

Final:

The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not effectively minimise the risks associated with aeromedical operations to remote islands. [Minor safety issue]

ATSB response: As advised in response to question 26 above, the draft report was forwarded to the Commission on 30 July 2012 for consideration for release to the public under S25 of the TSI Act. As part of its S25 approval process, the Commission reviews the evidence in support of any draft findings. In this instance, the Commission felt that there was insufficient evidence to support the finding as drafted in the 16 July 2012 draft report. After consideration of all of the evidence, the Commission approved the final report text and findings on 16 August 2012.

42. Please explain the following change. What evidence was received?

Draft (16 July):

• Formal training for international operations was implemented.
• A refresher training course for Westwind pilots was implemented, covering:
– Compliance, company structure, standard operating procedures, fuel calculations, flight planning and company human resources policies.
– Knowledge of Westwind and CAO 20.7.1.B performance requirements, and the calculation of take-off data and CAO 100.7 weight and balance calculations.
– Human factors, incorporating crew resource management and threat and error management skills (this course will take place biennially).
– Revalidate all crew on the principles of Global Positioning System equipment for en-route navigation.
– Safety Management System (SMS) training and in the Company Safety Policy.
– Ensure crew have a complete understanding of the FAID® system as part of the company's fatigue risk management system and to ensure pilots understand and are proficient in completing the fatigue aspects of the operator's SMS reporting system.
– Knowledge of aircraft systems.
– Instrument flight rules and procedures.
– Defect reporting requirements and the use of the aircraft maintenance log.
– Point of no return training, and training in the use of the 'Howgozit' graph for monitoring fuel use during long flights.
– The amended Westwind fuel policy.
The plan was initially supported by detailed pilot operations notice P47/09, which laid out the new operating requirements for Westwind operations. The general requirements were later transferred

into the operations manual and supported by a shorter pilot operations notice, P 38/10, which provided Westwind-specific nominal fuel planning figures.
The operator is planning a review of the above changes, in consultation with the initial change agents, to assess the relevance of the implemented changes as an effective risk mitigation. Any subsequent change to the operator's processes will be controlled through the review process.

A refresher training course for Westwind pilots was implemented that covered required knowledge for Westwind operations.

ATSB response: The list of training that was included in the draft report reflected the Pel-Air management action plan in response to the findings of the CASA special audit. The action plan was designed to address a wide range of measures to provide the operator with confidence in the safety of its operations. This required the implementation of a range of standards and processes, supported by suitable training, and included a number of stages to be completed before recommencing Westwind domestic and then international operations.

A number of the actions that were listed as *Action taken by the aircraft operator* in the draft report were not taken as a result of the ATSB's safety investigation and findings, and therefore did not actually represent safety action in consequence of the ATSB's investigation. As a result, some of the Pel-Air actions in response to the findings of the special audit were removed from the final report. For example, consideration and/or application by the flight crew of the CAO 20.7.1.B performance requirements or CAO 100.7 weight and balance calculations (second bullet point in the refresher training course listed in the draft report), or crew understanding of the principles of Global Positioning System equipment for en-route navigation (fourth bullet point in the refresher training course listed in the draft report) were not a factor.

43. It seems the aircraft was not certified for RVSM operations in RVSM airspace despite planning and operating in Fiji airspace and Auckland Oceanic RVSM airspace. This appears to be contrary to the Fiji AIP dated Nov 2006 and the NZ AIP dated 15 Nov 2007. Section 1.3.7 of the AIP outlines the purpose of 1.3.5 as not being a method to circumvent the normal RVSM approval process. At the 21 November hearing Mr Dolan stated that the operator was exempt as an aeromedical flight (p.16). The AIP appears to only exempt one off flights, such as mercy flights or humanitarian flights, not regular commercial flights as per 1.3.7. Would you please explain these apparent differences to the committee? Is there evidence that 4 hours' notice was given?

ATSB response: The implications for the flight-planned MED1 (ambulance) flight of the operation in RVSM airspace was discussed in the ATSB's supplementary submission of 11 November 2012.

New Zealand Aeronautical Information Publication (AIP) ENR 1.8 *REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)*, paragraph 1.3.7 allows non-RVSM aircraft to flight plan for operations in New Zealand-administered RVSM airspace under certain exceptional circumstances. These circumstances are set out in paragraph 1.3.5 and require special coordination with New Zealand air traffic control in accordance with paragraph 1.3.6 of the AIP.

In the case of the flight from Apia to Norfolk Island, it was not a 'regular commercial flight', having been flight planned as a MED1 or ambulance flight. That was, the flight was for humanitarian purposes. In accordance with paragraph 1.3.5(c) of ENR 1.8 of the New Zealand AIP, this was an approved exception for the flight to be conducted in RVSM airspace.

There was no evidence the pilot provided 4 hours' notice of the flight to New Zealand air traffic control.

AIP Fiji Islands AIP ENR 2 *RNP AND RVSM PROCEDURES* paragraphs 2.3.5 and 2.3.7, while not exactly the same as the New Zealand AIP, mimic the requirements of the New Zealand document. The special coordination requirements of paragraph 2.3.6 of the Fiji AIP are not as extensive as paragraph 1.3.6 of the New Zealand document but the requirement for a minimum of 4 hours' notice when requesting approval for non-RVSM aircraft to operate in that Fiji airspace remains.

44. Given the issue outlined above could you please explain an email from Mr James from 25 December 2008 to the head of Pel-Air, which in part reads:

"Had big issue with NZ ATC over not being RVSM again but needing to fly in RVSM airspace – I feel like we're on borrowed time with this one – soon they will just say no and put us down to 28 thousand – will be a big deal then."

ATSB response: Without a full understanding of the circumstances of the operation to which Mr James refers in his email, it is difficult to comment definitively. However, as indicated in the ATSB's submission of 11 November 2012, had an individual Pel-Air flight not been cleared into RVSM airspace as requested, this would have presented an operational constraint for the affected pilot because of increased fuel consumption, the management of which may have required him to re-plan via other locations, including any requirement to take on additional fuel as required.

More generally, should the situation as discussed in Mr James email eventuate and affect Pel-Air's operations in general, it could be assumed that Pel-Air would develop their own operational plans and adjustments to be able to continue operations.

45. Would you please address the evidence in the April 2003 study in Mr Aherne's submission where the operator breached RVSM airspace many times?

ATSB response: It appears in paragraphs 3.3.4 to 3.3.6 of the *Pacific Approvals Registry and Monitoring Organisation* (PARMO) paper (see page 32 of Mr Aherne's submission) that PARMO's main concerns were air traffic control-related, in that:

- some flights were incorrectly indicating in their flight plan that their aircraft were RVSM capable, but did not have State approvals to do so
- this increased the risk that air traffic control would inadvertently apply the RVSM-related separation standard of 1,000 ft to such aircraft, rather than the relevant 2,000 ft standard.

In such cases there was the risk of a breakdown in separation. However, it appears that in the cases of the relevant traffic samples examined by PARMO in the Brisbane and Nadi flight information regions (paragraphs 5.4 and 5.9 of the PARMO paper), the air traffic control units were able to provide adequate separation without disadvantage to RVSM-approved aircraft.

46. How did the ATSB treat the findings of CASA Special Audit (p.17) that some proficiency checks were undertaken by unapproved persons?

ATSB response: The pilots' endorsements, qualifications and experience were listed in pages 13 and 14 of investigation report AO-2009-072. The pilots' training and proficiency checks were discussed in the ATSB's supplementary submission of 11 November 2012.

In respect of the CASA Special Audit finding that some proficiency checks were undertaken by unapproved persons, the Executive Manager, CASA Legal Services indicated during CASA's appearance at the Committee on 22 October 2012 that this issue more correctly referred to the conduct of 'in command under supervision' elements of Mr James training. In this respect, the Manager Legal Services explained that, in accordance with the Pel-Air operations manual, the supervisory pilots were approved by Pel-Air to undertake the training.

The Manager Legal Services clarified further that, although the special audit found that the affected pilots were not approved by CASA, in fact they were not required to be approved by CASA. The view expressed in the special audit report was incorrect.

47. In the ATSB's submission, there is mention of work underway to enable readers of ATSB final reports to see 'track changes' to reports (p. 44). What has been the impetus for this change and when you do expect these changes will be implemented?

ATSB response: There had previously been evolving discussions amongst investigators on the need to transparently track any changes to published investigation reports. Consideration was being given to what library, academic or other methodology might be appropriate to the ATSB's needs.

Shortly after the release of investigation report AO-2009-072, one of the parties to the investigation questioned how affected parties might track any typographical or other corrections or changes to the final report. After initial discussions with the Commission, the Commission directed that a mechanism should be developed so that, in particular our involved parties but also the readers of our reports in general are made aware of and can:

- track when a change has been made to a final report;
- identify the change; and
- have an understanding for the change if it is substantive and the reason for the change is not clear from the context.

The ATSB is working with the Australian Government Information Mapping Office in this regard with the aim of having a final report change tracking process in place by the end of the first quarter of calendar year 2013.

48. Why was there no discussion in the ATSB report of the possibility of 'skip fading' in relation to high frequency (HF) radio transmissions?

ATSB response: The potential for reduced signal quality when using HF radio was discussed on page 17 of investigation report AO-2009-072. It was also highlighted that differing HF frequencies may be necessary depending on the ambient conditions and time of day. The specific phenomenon of 'skip fading' was not included in the investigation report as there was no evidence, including during any of the interviews with either pilot, or during the flight reconstruction to suggest that the performance of the HF was a factor in the accident (also see page 17 of the investigation report).

In any case, the HF transcript showed that, wherever the pilots may have missed or misunderstood part of a transmission, the air traffic controller making that transmission was asked to '...say again' that element of the transmission that may have been missed or misunderstood. This is standard radio terminology and practice.

49. Why wasn't the entire HF transcript reproduced in the ATSB report?

ATSB response: Reflecting Mr Dolan's evidence to the Committee on 22 October 2012, the ATSB's supplementary submission of 11 November 2012 explained that an ATSB investigation report needs to recognise and meet the non-disclosure requirements of Annex 13 (as set out in paragraph 5.12), as well as the associated 'restricted information' provisions of the Transport Safety Investigation Act 2003, while containing sufficient information to support the analysis and findings of the report.

As indicated above and reported on page 17 of investigation report AO-2009-072, there was no evidence and therefore finding that HF or other radio performance was a factor in the accident. On this basis, there was no need to include the entire HF transcript in the investigation report.

50. Why doesn't the ATSB report isolate the latest point of safe diversion to Noumea to one particular point in time?

ATSB response: The ATSB could not isolate the last point of safe diversion (LPSD) to one particular point in time because of the variation possible in the assumptions considered by a flight crew when making this calculation. These considerations affect the location of the LPSD, so a single location could not be calculated.

51. Why doesn't the ATSB report mention the fact that neither Auckland or Fiji Air Traffic Control (ATC) passed on to the flight crew the amended forecast for Norfolk Island, after the Norfolk Island Unicom operator had passed this information on to Auckland ATC?

ATSB response: The fact that the amended Norfolk Island TAF was not passed to the flight crew by Nadi air traffic control was mentioned on pages 7 and 16 of investigation report AO-2009-072.

52. What is the relevance of the discussion of TEM (threat and error management) in the ATSB report? (p. 36)

ATSB response: As indicated on page 36 of investigation report AO-2009-072, Threat and Error Management (TEM) provides a means to observe and measure a crew's response to in-flight risks. Although not stipulated for aerial work operations, given the content and guidance provided in the discussion of the three main components of TEM, the investigation report makes the point that operators may find its application to their operations of benefit.

53. In the ATSB investigation, why was a survey done of students regarding en route management and diversion requirements, and not of experienced pilots? (p. 34)

ATSB response: This survey formed part of a three-part examination of the hypothesis that the available guidance on fuel planning and on seeking and applying en route weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. As indicated in pages 34 to 36 of investigation report AO-2009-072, there were two other components to the test. Interviews were carried out with a number of operators of similar flights, and their operations manuals examined; and eight experienced pilots were interviewed about an in-flight scenario similar to that actually experienced in the flight to Norfolk Island.

These interviews, surveys and examinations found an inconsistent interpretation and application of the existing regulatory and other guidance, which was consistent with its general nature. As such, there was a risk across industry of the use of incorrect methods when deciding to divert or continue to an unsuitable destination. This finding was not experience-specific, but was evident across a diverse range of industry members.

The availability of more specific guidance would allow pilots to more consistently interpret and apply the intent of the existing regulatory and other guidance to their decisions to divert.

54. Why is there little examination in the ATSB report of the Bureau of Meteorology's role in terms of the quality of weather forecast information available and the reduction in services at Norfolk Island?

ATSB response: The meteorology reports and forecasts in the period leading up to and immediately following the accident are at pages 16 and 53 to 63 of investigation report AO-2009-072.

The reliability of Norfolk Island weather forecasts and discussion of a previous safety recommendation that was issued to the Bureau of Meteorology (BoM) in that regard was included in the ATSB supplementary submission of 11 November 2012. In addition, in his evidence of 21 November 2012, Mr Dolan indicated that an examination of the reliability of BoM forecasts for Norfolk Island found that these were unreliable somewhere between 0.6 and 0.8 per cent of the time — or six or eight times in a thousand forecasts.

Reflecting Mr Dolan's evidence to the Committee on 22 October 2012, the ATSB's supplementary submission of 11 November 2012 explained that an ATSB investigation report needs to recognise and meet the non-disclosure requirements of Annex 13 (as set out in paragraph 5.12), as well as the associated 'restricted information' provisions of the Transport Safety Investigation Act 2003, while containing sufficient information to support the analysis and findings of the report.

The findings in respect of this investigation are at pages 43 and 44 of the investigation report. None related to the quality of the BoM forecasts that day. As a result, there was no discussion of the quality of the BoM forecasts

ATTACHMENT 1 TO
ATSB RESPONSE TO
WRITTEN QUESTIONS ON NOTICE OF
WEDNESDAY 21 NOVEMBER 2012

TABULAR DATA IN SUPPORT OF THE ATSB RESPONSE TO QUESTION 24

Table 1

How many recommendations or critical safety issues were made or identified between 2001–2005 and since 2006–2012 for completed investigations?

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total 2001-2005	Total 2006-2012
Critical safety issues	-	-	-	-	-	-	0	0	0	1	0	0	-	1
Significant safety issues	-	-	-	-	-	-	14	7	22	11	12	7	-	73
Minor safety issues	-	-	-	-	-	-	1	12	31	65	41	15	-	165
ATSB recommendations	92	68	16	48	19	19	32	4	2	3	1	0	243	61
Safety Advisory Notices (SANs)	6	8	0	4	0	4	0	3	2	1	2	1	18	13
Proactive safety actions by industry	-	-	-	-	-	32	49	43	69	89	61	27	-	370
NUMBER OF INVESTIGATIONS COMPLETED	118	95	57	80	85	88	73	67	79	57	59	42	435	465
TOTAL SAFETY ISSUES IDENTIFIED	98	76	16	52	19	23	32	19	53	77	53	22	261	279
TOTAL SAFETY ACTIONS TAKEN	73	68	12	36	14	48	71	47	73	93	63	28	203	423

Table 2

How many recommendations issued by the ATSB were addressed by safety actions?

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total 2001-2005	Total 2006-2012
All organisations														
Number of recommendations issued	92	68	16	48	19	19	32	4	2	3	1	0	243	61
*Number of recommendations addressed**	67	60	12	32	14	12	22	1	2	3	0	0	185	40
% addressed	73%	88%	75%	67%	74%	63%	69%	25%	100%	100%	0%	N/A	76%	66%
CASA														
Number of recommendations issued	43	29	7	27	6	8	16	0	2	0	0	0	112	26
*Number of recommendations addressed**	27	25	4	17	3	8	13	0	2	0	0	0	76	23
% addressed	63%	86%	57%	63%	50%	100%	81%	N/A	100%	N/A	N/A	N/A	68%	88%
Airservices Australia														
Number of recommendations issued	9	9	2	4	0	5	4	0	0	0	0	0	24	9
*Number of recommendations addressed**	7	8	1	2	0	5	4	0	0	0	0	0	18	9
% addressed	78%	89%	50%	50%	N/A	100%	100%	N/A	N/A	N/A	N/A	N/A	75%	100%

** NB: 'Addressed' recommendations include both recommendations that were fully addressed, and those that were partially addressed by safety actions.*

Table 3

How many recommendations or critical safety issues related to CASA and Airservices Australia?

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total 2001-2005	Total 2006-2012
Critical safety issues														
CASA	-	-	-	-	-	-	0	0	0	0	0	0	-	0
Airservices Australia	-	-	-	-	-	-	0	0	0	0	0	0	-	0
Significant safety issues														
CASA	-	-	-	-	-	-	10	0	12	2	3	2	-	29
Airservices Australia	-	-	-	-	-	-	3	2	1	0	2	1	-	9
Minor safety issues														
CASA	-	-	-	-	-	-	1	0	6	11	4	3	-	25
Airservices Australia	-	-	-	-	-	-	0	0	3	2	1	1	-	7
ATSB recommendations														
CASA	43	29	7	27	6	8	16	0	2	0	0	0	112	26
Airservices Australia	9	9	2	4	0	5	4	0	0	0	0	0	24	9
Safety Advisory Notices (SANs)														
CASA	3	2	0	2	0	0	0	0	1	0	0	0	7	1
Airservices Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Proactive safety actions by industry														
CASA	-	-	-	-	-	7	13	5	18	13	7	5	-	68
Airservices Australia	-	-	-	-	-	1	3	1	4	2	3	2	-	16
TOTAL SAFETY ISSUES INVOLVING CASA	***46***	***31***	***7***	***29***	***6***	***8***	***16***	***0***	***18***	***13***	***7***	***5***	119	67
TOTAL SAFETY ACTIONS TAKEN BY CASA	***30***	***27***	***4***	***19***	***3***	***15***	***26***	***5***	***21***	***13***	***7***	***5***	83	92
TOTAL SAFETY ISSUES INVOLVING AIRSERVICES	***9***	***9***	***2***	***4***	***0***	***5***	***5***	***2***	***4***	***2***	***3***	***2***	24	23
TOTAL SAFETY ACTIONS TAKEN BY AIRSERVICES	***7***	***8***	***1***	***2***	***0***	***6***	***7***	***1***	***4***	***2***	***3***	***2***	18	25

Table 4

What are the proportions of all recommendations or critical safety issues made or identified by the ATSB that related to CASA and Airservices Australia?

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total 2001-2005	Total 2006-2012
Critical safety issues														
CASA	-	-	-	-	-	-	-	-	-	0%	-	-	-	0
Airservices Australia	-	-	-	-	-	-	-	-	-	0%	-	-	-	0
Significant safety issues														
CASA	-	-	-	-	-	-	71%	0%	55%	18%	25%	29%	-	40%
Airservices Australia	-	-	-	-	-	-	21%	29%	5%	0%	17%	14%	-	12%
Minor safety issues														
CASA	-	-	-	-	-	-	100%	0%	19%	17%	10%	20%	-	15%
Airservices Australia	-	-	-	-	-	-	0%	0%	10%	3%	2%	7%	-	4%
ATSB recommendations														
CASA	47%	43%	44%	56%	32%	42%	50%	0%	100%	0%	-	-	46%	43%
Airservices Australia	10%	13%	13%	8%	0%	26%	13%	0%	0%	0%	-	-	10%	15%
Safety Advisory Notices (SANs)														
CASA	50%	25%	-	50%	-	0%	-	0%	50%	0%	0%	0%	39%	8%
Airservices Australia	0%	0%	-	0%	-	0%	-	0%	0%	0%	0%	0%	0%	0%
Proactive safety actions by industry														
CASA	-	-	-	-	-	22%	27%	12%	26%	15%	11%	19%	-	18%
Airservices Australia	-	-	-	-	-	3%	6%	2%	6%	2%	5%	7%	-	4%

ATTACHMENT 2 TO
ATSB RESPONSE TO
WRITTEN QUESTIONS ON NOTICE OF
WEDNESDAY 21 NOVEMBER 2012

COMPARISON OF DRAFT AND FINAL REPORTS AO-2009-072 WITH THE CASA SPECIAL AUDIT REPORT

The following table builds on the table that was previously provided to the Committee as Appendix A to the ATSB's supplementary submission of 19 October 2012. In it, the content of the draft (16 July 2012) and final investigation reports are compared with the findings of the Civil Aviation Safety Authority's special audit. The reference to the final investigation report is in 'pXX' format and, where there is a similar reference in the draft report, in the '[pXX]' format.

Audit finding	**Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively**
Inadequate fuel policy for Westwind operations.	P25 [p33] of the report refers to CAR 220, highlighting that an operator also shares the responsibility for ensuring that sufficient fuel and oil is carried, and was required to include specific guidance for the computation of the fuel carried on each route in their operations manuals. Discussion of the operator's fuel policy that appeared somewhat less than ideal included at: • P29 [p37] of the report, which highlighted a disparity between Parts A (9.11.2) and B (6.1.2) in respect of the calculation of critical points for use depending on the availability of critical or intermediate aerodromes. • Also in respect of abnormal operations, p29 [p37] of the report also highlights that aerodrome 'criticality' and 'adequacy' were not defined. • In addition, p30 [p37] of the report relates that whereas the operator's planning methodology for determining the point of no return (PNR) was satisfactory for determining a return in the same configuration as the outbound leg but was not appropriate for a return leg where that leg had a higher fuel burn than that outbound.

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	• Moreover, on p31 [p39] of the report, the lack of a definition for the term 'marginal aerodrome' is highlighted. This marginality (of the weather) at a destination was stipulated by the operator to require the calculation of a latest divert time by a pilot. • In respect of the requirement to declare an emergency if it became apparent that a landing would result with less than the fixed reserve, p31 [p39] of the report also identified that the operations manual did not state whether this fuel related to normal or abnormal operations from the least favourable position in the flight. Overall, the investigation's concerns in regard to fuel planning and guidance for application to cases of in-flight deterioration of previously good destination weather go directly to the two safety issues at p43 [p49] of the investigation report. These safety issues identified that: • The available guidance on fuel planning and on seeking and applying en route weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. *[Minor safety issue]* • The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not effectively minimise the risks associated with aeromedical operations to remote islands. *[Minor safety issue]* In support of those findings: • On p26 [p34] of the report, the lack of guidance in the Aeronautical Information Publication (AIP) about the in-flight study of amended forecasts is highlighted. This included the lack of guidance of how and when to apply new aerodrome observations to the initial forecast-based decision on the need or otherwise for an alternate, or to a later decision about a possible diversion. • P31 [p39] of the report highlights that, although pilots were to calculate a last safe point of diversion if the weather at the planned destination became 'marginal' and the possibility of a safe approach and landing diminished, the term marginal was not defined. • In addition, p34 [p41] of the report observes that the ATPL(A) theory provided no specific guidance

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	on what: o operational information to seek, or when it should be sought o to do with updated operational information that may become available o information could be sought en route that might influence the decision to continue to a destination. • P35 [p41 and 42] of the report discussed that a number of operators whose operations manuals were examined as part of the investigation either had no guidance, or did not provide consistent guidance on the process to be used when crews were deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island. • On page 39 [p45] of the report (Analysis), the ATSB comments that there were no regulated requirements or operator procedures to inform the crew of when to obtain the most recent weather information in order to manage an un-forecast deterioration in the weather. It was concluded that this increased the risk of crews inadvertently continuing to an unsafe destination. • Further, on p39[p49] of the report (Analysis), the ATSB comments that the provision of: o clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions. o more specific guidance, particularly in the case of flight to a remote island, would allow pilots to more consistently interpret and apply the intent of the existing regulatory and other requirements. Safety action is reported in respect of these safety issues at pp 45 to 49 [p59 to 60] of the report. Of more concern for the investigation was the across-industry aspect of the first safety issue. Safety action by CASA is reported at pp 45 to 47 [p59 to 60] of the report to address this issue across-industry aspect.

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
Pilots use their own planning tools and there is no control exercised by Pel-Air to ensure that the fuel figures entered are valid.	In this respect p32 [p39] of the report states that: • flight crews were expected to use their own methods, systems and tools for pre-flight planning in compliance with the provisions of the operations manual • it was reported that co-pilots modified their techniques to reflect the preferred methods of each pilot in command with whom they flew • there was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crew's compliance with the operator's procedures. In addition, p37 [p48] (Analysis) states that no detailed and consistent methodology for carrying out flight planning was available. The comment was made in the report that this would explain flight crews applying their own individual methodologies and reports of copilots varying their techniques to suit respective pilots in command (PIC). [p50 *…which in part might have been explained by the operator's expectation that pilots would use their own methods, systems and tools for pre-flight planning.*] Finally, p38 of the report (Analysis) comments that although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified. [p45 '*thoroughness of flight planning…*']
No policy to ensure that flight and fuel planning is cross checked to detect errors.	In p3 [p13] of the report, it is reported that the copilot did not, and was not required to participate in the flight planning. In addition, p32 [p39] of the report highlights that copilots modified their techniques to reflect the preferred methods of each pilot in command with whom they flew. Finally, on p38 [p48] of the report (Analysis) the ATSB observed that the development of the flight plan

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	by the PIC without input from the copilot was in accordance with standard operating procedures. The report continued that this meant that the flight plan was developed by one person and not reviewed by the copilot for accuracy and compliance with requirements. The conclusion was drawn that this reduced the likelihood that any flight planning omissions or errors would be identified.
No alternate requirements specified for remote area and remote island operations.	This is consistent with the observation on p32 [p39] of the report, which states that flight crews were expected to use their own methods, systems and tools for pre-flight planning in compliance with the provisions of the operations manual.
Flight crews ignoring the operations manual requirement for 30-minute fuel checks.	At p6 [p15] of the report, a pilot report is highlighted that once established at FL390, the pilot reviewed the fuel required for the remainder of the flight against the fuel remaining in the aircraft. This might imply at least 30-minute fuel reviews by the pilot. The operator's requirement for 30-minute fuel checks is discussed on p31 [p39] of the report. The issue of flight crews largely 'ignoring' the operator's 30-minute fuel check requirement could have been (at least in part) explained by the fact that there was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crew's compliance with the operator's procedures (see p32 of the report). P38 [pp49 to 50] of the report (Analysis) comments that, although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified.
No criteria specified in the operations manual in regard to obtaining weather updates.	This goes directly to the two safety issues at p43 [p49] of the investigation report, and is a wider responsibility than the operator alone. The safety issues identified stated that: • The available guidance on fuel planning and on seeking and applying en route weather updates was

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. *[Minor safety issue]* • The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not effectively minimise the risks associated with aeromedical operations to remote islands. *[Minor safety issue]* In support of those findings: • On p26 [p34] of the report, the lack of guidance in the Aeronautical Information Publication (AIP) about the in-flight study of amended forecasts is highlighted. This included the lack of guidance of how and when to apply new aerodrome observations to the initial forecast-based decision on the need or otherwise for an alternate, or to a later decision about a possible diversion. • P31 [p39] of the report highlights that, although pilots were to calculate a last safe point of diversion if the weather at the planned destination became 'marginal' and the possibility of a safe approach and landing diminished, the term marginal was not defined. • In addition, p34 [p41] of the report observes that the ATPL(A) theory provided no specific guidance on what: o operational information to seek, or when it should be sought o to do with updated operational information that may become available o information could be sought en route that might influence the decision to continue to a destination. • P35 [p42] of the report discussed that a number of operators whose operations manuals were examined as part of the investigation either had no guidance, or did not provide consistent guidance on the process to be used when crews were deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island. • On page 39 [p50] of the report (Analysis), the ATSB comments that there were no regulated requirements or operator procedures to inform the crew of when to obtain the most recent weather information in order to manage an un-forecast deterioration in the weather. It was

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	concluded that this increased the risk of crews inadvertently continuing to an unsafe destination. • Further, on p39 [p47] of the report (Analysis), the ATSB comments that the provision of: o clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions. o more specific guidance, particularly in the case of flight to a remote island, would allow pilots to more consistently interpret and apply the intent of the existing regulatory and other requirements. Safety action is reported in respect of these safety issues at pp 45 to 49 [p59 to 60] of the report.
Variance and inappropriate timing among pilots in obtaining (in-flight?) weather advice to support decision-making.	Not specifically discussed in the report but realistically, this goes to the above discussion/justification in respect of the lack of available guidance on fuel planning and on seeking and applying en route weather updates. Given this lack of guidance, one might expect the variance and inappropriate timing among pilots in obtaining (in-flight?) weather advice to support decision-making as identified in the CASA special audit. Of more concern for the investigation was the apparent wider issue across industry as enunciated in the first safety issue as follows: The available guidance on fuel planning and on seeking and applying en route weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. *[Minor safety issue]* Safety action by CASA is reported at pp 45 to 47 [p59 to 60] of the report to address this issue across industry.
No operational decision-making tools were provided to support crew when balancing aviation	There was no evidence that the medical nature of this occurrence contributed to the accident.

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
versus medical risks.	
Once tasked, pilots operated autonomously and made all decisions on behalf of the AOC and the AOC holder exercises little, if any, control over a task once commenced.	The nature of the aeromedical operation is highlighted at p4 [p14] of the report as follows: • It was not normal practice for crews to report to the operator if flights were progressing satisfactorily • In terms of a report from the flight crew that the operator did not normally monitor a flight as it progressed. In addition, at p32 [p38]of the report, it was highlighted that there was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crews' compliance with the operator's procedures. This would suggest a somewhat hands-off approach by the operator. Similarly, on p38 [p49] (Analysis), the report notes that there was significant variation in pre-flight planning procedures by flight crews that would have made it more difficult for the operator to oversee the consistent conduct of flights. The report also highlights that, although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified. Again, at p39 [p50] (Analysis) of the report, it is highlighted that there was a lack of regulated requirements or operator procedures to inform the crew of when to obtain the most recent weather information in order to manage an un-forecast deterioration in the weather. This increased the risk of crews inadvertently continuing to an unsafe destination. P40 of the report (Analysis) introduces the across-industry nature of this lack of guidance. In turn, this lack of guidance as it might affect distant operations gave effect to the two safety issue at p43 [p53] of the report and safety action was reported by the operator in pp48 to 49 [p59 to 60] of the

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	report.
No provision by the operator of domestic charts or publications to pilots, or action by the operator to ensure that pilots maintained a current set.	P16 of the Special Audit Report notes that international flights are provided with an International Trip Pack, which includes Jeppersen charts and instrument approach plates for the flight.
Failure by the operator to maintain or check flight records.	The comment is made on p32 [p38] of the report that there was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crew's compliance with the operator's procedures. In addition, p38 [p49] of the report (Analysis) highlighted significant variation in pre-flight planning procedures by flight crews that would have made it difficult for the operator to oversee the consistent conduct of flights. The report then observed that, although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified.
Use by pilots of their own flight planning tools with no control by the operator to ensure the validity of the data.	In this respect p32 [p38] of the report states that: • flight crews were expected to use their own methods, systems and tools for pre-flight planning in compliance with the provisions of the operations manual • it was reported that copilots modified their techniques to reflect the preferred methods of each pilot in command with whom they flew • there was no independent evidence to indicate that the operator routinely assured itself of the accuracy of pilot's international flight planning and forms or their in-flight navigation logs and crew's compliance with the operator's procedures. In addition, p37 [p50 Conclusion comment] (Analysis) states that no detailed and consistent

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	methodology for carrying out flight planning was available. The comment was made in the report that this would explain flight crews applying their own individual methodologies and reports of copilots varying their techniques to suit respective pilots in command (PIC). P38 [p49] of the report (Analysis) also comments that although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified. Finally, the operator's flight planning guidance, which included the need for own planning tool methodologies by pilots formed part of the second safety issue on p43 [p53] of the report: > The operator's procedures and flight planning guidance managed risk consistent with regulatory provisions but did not effectively minimise the risks associated with aeromedical operations to remote islands. *[Minor safety issue]* Operator safety action in response to this safety issue is reported at pp48 to 49 [p59 to 60] of the report.
Inadequate CAO 20.11 training (life raft refresher and emergency exit training deficient).	The pilot's (conducted 27 April 2008) and copilot's (19 April 2008) last CAO 20.11 emergency training were each out of date as shown on pp13 to 14 [pp 21 to 22] of the report. However, the crew and passengers' exit from the aircraft in particularly difficult circumstances were discussed in pp20 to 23. In particular, on p20 [p28], the crew and medical staff each stated that their ditching training assisted in their escape from the aircraft. Subsequently, the benefits from the completion of wet drill and HUET training in facilitating exit from the sinking aircraft is described at pp40 and 41 [p50] (Analysis) of the report – as is the degree of good fortune enjoyed by the occupants.

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	The benefit described by the flight and medical crew of their previous completion of wet drills and HUET is also listed as an Other key finding on p43 [p53] (Findings) of the report.
Inadequate documentation of training programs.	The requirements for post-endorsement training to be completed before a pilot could undertake aerial work were reported at p13 [p22] of the report. At p14 [22] of the report, it was highlighted that the ATSB was unable to independently confirm the extent of the pilot in command's post-endorsement training. In addition, on p 32 [p38] of the report the ATSB commented on the content and recording of pilot proficiency checks. In this respect, the ATSB observed that: • there was no independent evidence to confirm that the operator routinely assessed pilots' processes for calculating/updating PNRs en route and their application of that revised data to their alternate decision making • this was consistent with the requirements of the operations manual, which did not require all elements of a proficiency check to be recorded as having been carried out. Finally, on p40 [p49] (Analysis) of the report, the ATSB states that, in the absence of any independent record of post-endorsement training or proficiency checks of the pilot's knowledge in terms of the calculation and application of CPs and PNRs, it was unable to independently determine the PIC's ongoing exposure to, and application of those requirements in the Westwind. The ATSB suggested that the provision of clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions. The lack of readily available guidance material for reference by pilots and operators formed part of the justification for the safety issue at p43 [p53] of the report as follows: The available guidance on fuel planning and on seeking and applying en route weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	to divert. *[Minor safety issue]* Safety action in response to this safety issue was reported at pp45 to 47 [p59 to 60] of the report.
Inadequate training records for pilot endorsement and progression.	Training records were examined for the pilot's endorsement, copilot and first officer line training, flight in command under supervision flying training, and line check on the Westwind. Training records were examined for the copilot's endorsement, check to line as first officer, ground training in the Westwind, in command under supervision training.
Inadequate records of remedial training.	Relevant remedial training records were examined as they have related to the crew.
Deficiencies in training records.	The ATSB outlined at p13 [p22] of the investigation report those elements of post-endorsement training that were to be completed before a pilot could undertake aerial work. At p14 [p23] of the report, it was highlighted that the ATSB was unable to independently confirm the extent of the pilot in command's post-endorsement training. In addition, on p 32 [p42] of the report the ATSB commented on the content and recording of pilot proficiency checks. In this respect, the ATSB observed that: • there was no independent evidence to confirm that the operator routinely assessed pilots' processes for calculating/updating PNRs en route and their application of that revised data to their alternate decision making • this was consistent with the requirements of the operations manual, which did not require all elements of a proficiency check to be recorded as having been carried out. Finally, on p40 [p49] (Analysis) of the report, the ATSB states that, in the absence of any independent record of post-endorsement training or proficiency checks of the pilot's knowledge in terms of the calculation and application of CPs and PNRs, it was unable to independently determine the PIC's ongoing

Audit finding	Final and Draft investigation report references in 'pXX' and '[pXX]' format respectively
	exposure to, and application of those requirements in the Westwind. The ATSB suggested that the provision of clear and readily available guidance for seeking and applying amended en route weather and other information to in-flight operational decisions would assist pilots maintain proficiency in such in-flight decisions. The lack of readily available guidance material for reference by pilots and operators formed part of the justification for the safety issue at p43 [p53] of the report as follows: > The available guidance on fuel planning and on seeking and applying en route weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. *[Minor safety issue]* Safety action in response to this safety issue was reported at pp45 to 47 [p59 to 60] of the report.

Table 5

Safety actions taken by CASA and Airservices Australia to address safety issues identified by the ATSB

April 2007 to December 2012

** NB: This table includes all proactive safety actions taken to address safety issues identified by the ATSB, as well as those taken in response to safety issues where the ATSB issued a recommendation or Safety Advisory Notice (SAN).*

In this table, one row represents one safety issue. Several safety actions may have been taken by an action organisation to address the safety issue. All safety actions to address a safety issue are indicated in the 'Organisation Response' column.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2010-104	Significant	2/05/2012	Not yet addressed	Not yet addressed	Proactive safety action	Airservices Australia
AO-2011-016	Significant	30/04/2012	30/04/2012	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2011-082	Significant	8/06/2012	6/07/2012	28	Proactive safety action	Civil Aviation Safety Authority
AO-2008-059	Significant	31/05/2011	31/05/2011	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2009-080	Significant	24/06/2011	24/06/2011	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2009-080	Minor	24/06/2011	24/06/2011	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2011-045	Minor	21/11/2011	21/11/2011	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-084	Significant	16/12/2011	22/02/2012	68	Proactive safety action	Civil Aviation Safety Authority
AO-2009-065	Minor	27/01/2011	27/06/2011	151	Proactive safety action	Civil Aviation Safety Authority
AO-2009-081	Minor	11/11/2011	11/11/2011	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2011-055	Minor	8/08/2011	8/08/2011	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-084	Significant	16/12/2011	22/12/2011	6	Proactive safety action	Civil Aviation Safety Authority

Safety Finding
YMML speed restrictions
hydrogen embrittlement
G1 Dromader W&B issues
Airspace design for strategic separation
Compromised separation training
Ambiguity in documentation
Procedural & guidance framework
CASA exemptions do not provide level of safety
Third party access to Airbus
No additional maintenance for repetitve lift missions.
ELT re-programming risk
Service Life factors

Safety Issue
The Auto Release procedures at Melbourne Airport allowed for aircraft to be departed at or close to the separation minima, with no controls in place to ensure aircraft would maintain a minimum speed and flight crews would advise air traffic control if the speed could not be achieved.
A number of self locking nuts from other aircraft, of the same specification as that used to secure safety critical fasteners in VH-HFH, were identified to have cracked due to hydrogen embrittlement. [Significant safety issue]
The aircraft's centre of gravity varied significantly with hopper weight and could exceed both the forward and aft limits at different times during a flight.
Moorabbin GAAP airspace design did not assure lateral or vertical strategic separation between traffic flows. This increased the risk of a mid-air collision.
The controller had not received training in compromised separation recovery techniques.
Ambiguity existed between the Manual of Air Traffic Services and the Aeronautical Information Publication in relation to the assignment of non-standard cruising levels and the definition of an ‘operational requirement’.
The procedural and guidance framework for commercial balloon operations generally, did not provide a high level of assurance in regard to the safe conduct of low flying.
Operation of the M-18A in accordance with Civil Aviation Safety Authority exemptions EX56/07 and EX09/07 at weights in excess of the basic Aircraft Flight Manual maximum take-off weight (MTOW), up to the MTOW listed on the Type Certificate Data Sheet, may not provide the same level of safety intended by the manufacturer when including that weight on the Type Certificate.
When revising or maintaining its A320 endorsement training program, the third party training provider did not use or have access to current versions of the aircraft manufacturer’s recommended training program.
The scheduled maintenance requirements for ex-military UH-1 series helicopters may not adequately address the increased risk of fatigue failures associated with repetitive heavy lifting operations that were not considered in the original design fatigue calculations. [Minor safety issue]
There were only subtle cues to the fitment of programming dongles and no requirement to test Emergency Locator Transmitter (ELT) programming after installation, increasing the risk of inadvertent and undetected ELT re-programming and a less effective search and rescue response.
A number of operators of the PZL M-18 Dromader aircraft had not applied the appropriate service life factors to the aircraft’s time in service for operations conducted with take-off weights greater than 4,700 kg, as required by the aircraft’s service documentation. Hence the operators could not be assured that their aircraft were within their safe service life.

Organisation Response

To address the safety issue identified by the ATSB, Airservices has reviewed the relevant international and domestic documented requirements and discussed the current practises used at radar terminal area (TMA) aerodromes in Australia. On the basis of the above review, Airservices submitted a proposal to the Civil Aviation Safety Authority (CASA) on 23 March 2012 to amend the Aeronautical Information Publication (AIP). This amendment establishes a standard speed profile and ensures pilots of jet aircraft notify Air Traffic Control when operating at a significantly lower speed to this profile. Following review by CASA, Airservices will undertake industry consultation with the intent to align the implementation of the AIP amendment with the Aeronautical Information regulation and Control (AIRAC) date of 25 August 2012. As an interim measure, Airservices will investigate the implementation of procedures at Melbourne in accordance with our Safety Management System.
In response to the identification of hydrogen embrittled self locking nuts, CASA issued airworthiness bulletin (AWB) 14 002 on 12 October 2011 alerting aircraft owners, operators and maintenance personnel to the possibility of in situ failures of MS 21042 and NAS 1291 series self locking nuts. The AWB provided background information on previous occurrences and the mechanism and hazards associated with hydrogen embrittlement, and recommended that: (a) Pilots and maintenance personnel closely monitor the occurrence of hydrogen-induced delayed cracking in high-strength steel standard aircraft hardware, such as nuts via close inspection following installation and thereafter at Daily / Preflight and periodic inspections. (b) Before simply replacing cracked/failed nuts with new items, consider contacting the manufacturer for advice regarding replacement of associated fasteners which may have suffered over-loading as a result of the failure of one or more nuts. (c) Report all MS 21042 and NAS 1291 series nut failures to CASA via the SDR [Service
On 22 December 2011, CASA distributed a letter to operators of the M18, M18A, and M18B Dromader advising of the potential unusual movement of the aircraft's c.g. as the payload in the hopper is dumped or dispensed. The letter also advised operators to assess the weight and balance of their aircraft, develop new loading systems if necessary, and ensure that all pilots are familiar with the aircraft loading systems and the potential for c.g. variation.
In response to this safety issue, on 31 March 2011, Airservices Australia (Airservices) advised that: Airservices Australia thanks you for the opportunity to provide additional feedback in respect of the Safety Actions identified in draft report, as requested during our meeting on 21 March 2011. As stated in Airservices' initial response, we consider that there is insufficient weight of evidence or depth of analysis in the report to conclude, 'The Moorabbin Aerodrome General Aviation Aerodrome Procedures [GAAP] airspace design did not assure lateral or vertical strategic separation between traffic flows. This increased the risk of a mid-air collision '. GAAP environments were not designed to provide strategic "separation assurance" between traffic flows. Separation within the GAAP environment was see-and-avoid and principally the responsibility of the pilot. Post incident, the change to Class D has removed the GAAP arrival routes and although designated inbound reporting points exist, aircraft can request clearance into the airspace from any point. In addition, consequent to the change to Class D, CASA implemented a change as per AIP [Aeronautical Information Publication] ENR [En Route] 12.3.6; unless ATC [air traffic control] specifically instructs otherwise, establishment of two-way communications permits a pilot, intending to land at an aerodrome within Class D airspace, to descend as necessary to join the aerodrome traffic circuit. Thus, the current airspace design and rule set means that strategic separation between traffic flows is not possible. To improve safety at Moorabbin, Airservices has, as stated in our original response, implemented the following: - Traffic, staffing levels and other identified threats at Moorabbin are now routinely monitored and reviewed in conjunction with the 'Metro D' and location specific Operational Risk Assessment (ORA). - Increased staffing at Moorabbin has alleviated the operational need to combine positions. The ADCW [aerodrome control – west] position at Moorabbin is now routinely operated as a standalone position except where low workload allows it to be combined with other positions. This enables the controllers to provide timely traffic information to aircraft. - Although prior to the incident controllers were assessed on workload management, the National ATS Procedures Manual (NAPM) now provides strengthened formal traffic management guidance to controllers. It includes a list of the factors a tower controller should consider in assessing the appropriate number of aircraft for circuit operations.
Airservices has indicated that it plans to implemented a Compromised Separation Recovery training module for the enroute air traffic control groups, with the intention that all group controllers will undertake that training in the 2010/11 financial year. In addition, a dedicated Compromised Separation Recovery training module is now delivered at the Airservices Learning Academy.
Since the release of this report in 2003, Airservices has been investigating the issue of non standard routes and non standard levels in respect of recommendations R20030056 and R20030057. As you would be aware, flight planning errors of this type are routinely and reliably tracked through the ESIR [electronic safety incident report] application. Airservices analysed this data and ascertained that non standard routes are not normally a significant contributory factor to Breakdown of Separation. Nonetheless, over the past several years we have invested significantly in examining technical solutions that would detect flight planning errors and highlight them to the controller. Our investigations determined that it was not feasible to use either NAIPS (Airservices' flight planning system) or to develop a separate database to process flight plans prior to entering the Eurocat system. Further, we determined that the cost of implementation in Eurocat for a warning system is high, and as Airservices has now commenced work on its future ATS [air traffic services] system the lead time and cost does not support further work in this area We discussed the use of non standard levels with CASA [Civil Aviation Safety Authority] a number of years ago and it was determined that the number of changes of level that would be incurred if standard levels were required to be utilised in all cases would introduce an increased level of risk into the system. In addition, since this incident a number of changes have been introduced to improve instruction to both pilots and air traffic controllers on the use of non standard levels. The Aeronautical Information Publication (AIP) was updated on 18 November 2010 and now specifically states that a pilot must only request a non conforming level when it is determined by the pilot in command to be essential to the safety of the flight and its occupants. [In such circumstances, the phrase 'DUE OPERATIONAL REQUIREMENTS' must be included in the level change request.]
The Civil Aviation Safety Authority (CASA) advised that: ...the proposed Part 131 of the Civil Aviation Safety Regulations (CASR) 1998, presently entering legal drafting at Attorney General's Department, requires balloon AOC [Air Operator's Certificate] holders to have a safety management system. and that: CASA expects that the new legislation will require operators to address all risks within their organisation (not just low flying risks) in an organised manner, and maintain an ongoing review of risk within the organisation.
On 2 December 2011, CASA advised that it would inform all M18A operators other than those that have a supplemental type certificate permitting operation to 6,600 kg, that the exemptions do not permit agricultural operations in the restricted category above 4,700 kg MTOW. CASA also advised that they will be revising the exemptions to ensure that the intended interpretation is clear to operators.
CASA advised that new regulations applying to third-party training parties were expected to be introduced in 2011 with an effective date of 2012, and that these rules would more clearly specify the responsibilities of the training providers. It also advised that it was reviewing its processes for providing approvals for training providers' training programs.
On 5 July 2011, the Civil Aviation Safety Authority (CASA) published Airworthiness Bulletin 02 40 Issue 1 to: ...advise operators and maintainers to investigate the basis for and the correct implementation of the continuing airworthiness requirements of the applicable type certificate data sheet (TCDS) and incorporated supplemental type certificates (STC), particularly in regard to the retirement lives of all life-limited components.
On 6 June 2011, the Civil Aviation Safety Authority (CASA) published an Airworthiness Bulletin to alert maintenance organisations to the risk of programming dongles transferring potentially invalid details to the memory of ELTs. In addition, an article was planned for inclusion in CASA's Flight Safety Australia magazine to highlight this issue.
On 17 November 2011, the Civil Aviation Safety Authority (CASA) informed the ATSB, ...that CASA has written to the registered operators of all Australian registered M18 Dromader aircraft type to verify that, where applicable, they have procedures for recording aircraft time in service conducting overweight operations, and for the proper factoring of overweight flight time for calculation of the airframe service life. Responses have been received and assessed and, where necessary, CASA has conducted follow-up with particular operators. Further verification of operator procedures is expected to occur in accordance with CASA's surveillance program.

ATSB Response
The ATSB considers that this safety action appropriately addresses the safety issue, once the safety action has been completed.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the actions taken and proposed by the ATSB, CASA and STC holder will adequately address the safety issue.
The ATSB is satisfied that the action implemented by Airservices Australia, in conjunction with the change of GAAP aerodromes to Class D that was implemented by the Civil Aviation Safety Authority on 3 June 2010 (see the following section titled Civil Aviation Safety Authority) will adequately address the safety issue.
The ATSB notes the action by Airservices related to R20030056 and R20030057 and in response to the issues identified in this investigation. The ATSB is satisfied that, the combined action in response to R20030056 and R20030057 and that recommended by the Airservices investigation will, when implemented, adequately address the identified safety issues.
The ATSB notes the action by Airservices related to R20030056 and R20030057 and in response to the issues identified in this investigation. The ATSB is satisfied that, the combined action in response to R20030056 and R20030057 and that recommended by the Airservices investigation will, when implemented, adequately address the identified safety issues.
The ATSB is satisfied that the proposed Part 131 of the CASR will, once in place, adequately address the safety issue.
The ATSB is satisfied that, when completed, the action taken by CASA will adequately addresses the safety issue.
The ATSB is satisfied that that the action taken to date, and action proposed to be taken, by the various organisations will, when completed, adequately address this safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action proposed by CASA will, when complete, adequately address the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2008-059	Significant	31/05/2011	31/05/2011	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AI-2008-038	Minor	9/04/2010	9/04/2010	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2010-012	Minor	30/11/2010	30/11/2010	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2009-070	Significant	26/11/2010	Not yet addressed	Not yet addressed	Proactive safety action	Civil Aviation Safety Authority
AO-2009-032	Minor	28/07/2010	28/07/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2009-019	Minor	21/05/2010	21/05/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-062	Minor	7/07/2010	7/07/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-044	Minor	1/03/2010	1/03/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-044	Minor	1/03/2010	1/03/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2009-070	Minor	26/11/2010	26/09/2012	670	Proactive safety action	Civil Aviation Safety Authority
AO-2008-067	Minor	28/06/2010	28/06/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-083	Minor	14/07/2010	30/09/2010	78	Proactive safety action	Civil Aviation Safety Authority
AO-2009-004	Significant	5/10/2010	5/10/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AI-2008-038	Minor	9/04/2010	9/04/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-083	Minor	14/07/2010	30/09/2010	78	Proactive safety action	Civil Aviation Safety Authority
AO-2008-007	Minor	14/05/2010	14/05/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-007	Minor	14/05/2010	14/05/2010	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-049	Minor	16/06/2009	16/06/2009	Action completed during investigation	Proactive safety action	Airservices Australia

Safety Finding
Airspace design for strategic separation
PANS-OPS guidance ambiguities
ATC Group Practices
Guidance for supervision of Ag 2 Pilots
Robinson training requirements
Co-location of fan and flight controls
Robinson-specific training
Proposed CASR Part 142
Regulatory Authorisation to Supervise Ag 2 Pilots
Cracks in the OCC difficult to detect
CASA Documentation.
Design permitted avionics malfunction via moisture
PANS-OPS guidance ambiguities
AFR Guidance.
Third party training oversight
CASR Part 142
Line-up and wait instruction

Safety Issue
Moorabbin GAAP airspace design did not assure lateral or vertical strategic separation between traffic flows. This increased the risk of a mid-air collision.
Ambiguities existed in the guidance used in the design of omnidirectional Standard Instrument Departure procedures. Such ambiguities may lead to an increased risk of inconsistent procedure design or application and an increased risk of collision for an aircraft following an instrument departure procedure.
Practices used within the ATS Group did not ensure that NOTAMs were effectively reviewed and communicated.
The lack of guidance material for the supervision of a pilot with an Agriculture Pilot (Aeroplane) Rating Grade 2 increases the risk of inadequate supervision of such a pilot
There were no specific training requirements for Robinson helicopters in Australia, such as those in Federal Aviation Administration Special Federal Aviation Regulation 73-2.
The co-location of the engine cooling fan and flight control systems increased the susceptibility of the helicopter to control problems in the event of a cooling fan failure.
There was no Australian requirement for endorsement and recurrent training conducted on Robinson Helicopter Company R22/R44 helicopters to specifically address the preconditions for, recognition of, or recovery from, low main rotor RPM.
There was no provision in the current CASA Regulations or Orders for third party flight crew training providers. As such, the responsibility for training outcomes was unclear.
Confusion within the aerial application industry concerning the correct authorisation for a supervisor of a pilot with an Agriculture Pilot (Aeroplane) Rating Grade 2 (Ag 2) increases the risk of an inappropriately qualified person supervising such a pilot.
The nature of the fatigue crack in the outer combustion case meant that it could be difficult to detect directly, or as a result of degraded engine performance, until catastrophic failure.
The flight planning requirements at page 88 of the Visual Flight Guide included a transcription error that inadvertently limited the application of the requirements of Civil Aviation Regulation 239.
The design and relative positioning of the external air vent and avionics modules permitted the ingress of moisture and particulates that led to corrosion and contamination of electronic avionics components and consequently the generation of multiple erroneous crew alerting system (CAS) messages due to electrical shorting.
Ambiguities existed in the guidance used in the design of omnidirectional Standard Instrument Departure procedures. Such ambiguities may lead to an increased risk of inconsistent procedure design or application and an increased risk of collision for an aircraft following an instrument departure procedure.
The current advice in Civil Aviation Advisory Publication 5.81-1(0) Flight Crew Licensing Flight Reviews in relation to the assessment of navigation skills, represents a missed opportunity to identify a pilot's capacity to make safe and appropriate decisions during cross country flying.
There was no clear division of responsibilities between the aircraft operator and the third party training provider in regard to ensuring the standards of flight training met all of the operator’s requirements, which had the potential of reducing training effectiveness.
There was no provision in the current Civil Aviation Safety Authority regulations or orders regarding third party flight crew training providers, with the effect that the responsibility for training outcomes was unclear.
The use of a combined line-up and wait instruction with a departure instruction, as permitted by the Australian Manual of Air Traffic Services (MATS), can cause confusion with flight crews.

Organisation Response
A review of the utility of General Aviation Aerodrome Procedures airspace across Australia was carried out by an independent contractor on behalf of CASA. Following stakeholder feedback, a report was released on 15 December 2009. The contractor's report produced 24 recommendations covering a wide range of potential safety enhancements, including the following: • the establishment of strategic expert oversight for all Australian GAAP operations; • future strategic safety enhancements, specific safety enhancements; • planning to monitor changes to future airport activity that may affect safety, and methods for implementing change if it is deemed necessary; • the acquittal of relevant ATSB recommendations issued in 2004; and • limits on aircraft numbers operating GAAP circuit patterns. On 15 July 2009, CASA issued a direction that had effect from 21 July 2009. The direction required that the number of aircraft in the circuit for one runway be limited to six, but allowing for one more aircraft to operate in the circuit with the intent of departing. The direction required all aircraft to obtain an Air Traffic Control clearance to enter, taxi along or cross any runway. On 24 December 2009, the direction was amended so that the limiting number of aircraft would be increased to eight from 18 January 2010. That limit was to remain in force until Class D procedures were implemented at previously GAAP airspace aerodromes on 3 June 2010. On 3 June 2010, Class D procedures were implemented at all aerodromes where GAAP procedures had previously been implemented. On 21 April 2011, the ATSB sought an update from CASA of its actions in response to the recommendations of the above report. In response, on 9 May 2011, CASA provided the following update: I refer to your email dated 21 April 2011 seeking a Civil Aviation Safety Authority (CASA) update on any completed/planned actions in relation to recommendations from The Utility of General Aviation Aerodrome Procedures (GAAP) to Australian-administered Airspace Review Report (Version 2 – 15 December 2009). - 38 - The GAAP to Class D project involved an extensive national pilot education program focussed primarily upon operations at the then GAAP aerodromes. The program was widely acknowledged by industry as one of the most comprehensive and effective education processes ever undertaken by CASA. The transition at these locations has provided the following safety enhancements: • increased alignment with international practice together with greater standardisation of procedures nationally; • increased Air Traffic Control Tower staffing through the requirement to establish a permanent Surface Movement Control position, thus both providing increased capacity to monitor airborne traffic and enhancing ground movement safety; • an ongoing program to remove compulsory Control Zone entry points providing additional flexibility for traffic management; and • reduction in airborne radio congestion through the extended use of abbreviated clearances. A Post Implementation Review has been undertaken to examine the
As a result of this safety issue, Airservices Australia (Airservices) advised the ATSB that they had reviewed the Standard Instrument Departure procedure affecting runway 28 right (28R) at Archerfield Airport and, following clarification from CASA, that they intended to remove the requirements of NOTAM C250/07. In addition, Airservices will modify the instrument departure procedure to require that the hangar to the right of the runway 28R flight strip must be visible to a pilot before commencing takeoff. Consistent with that modification, lighting will be required on the hangar to improve its visibility.
Airservices Australia has reviewed the procedures for the review and communication of notices to airmen and considers that if correctly applied, the procedures are sound. However, as a result of this incident, Airservices will conduct an education program to highlight the effect on safety, when information pertaining to a controller's area of responsibility is not considered appropriately or reviewed prior to that information being provided to pilots.
In its response to this safety issue, CASA advised that: CASA will development [sic] an Advisory Circular that provides guidance to industry as to how supervision of Ag 2 pilots may be conducted. CASA will also address the issue of differences in the aeroplane along with the helicopter flight training syllabi.
The Civil Aviation Safety Authority (CASA) has advised that it will review the requirements for initial pilot training and endorsement and recurrent training on Robinson R22 helicopters. Included will be a review of the Helicopter Flight Instructor's Manual to ensure that the required competencies are being covered by flight instructors and trained to students.
As a result of this occurrence CASA released airworthiness bulletin AWB 63-007 on 20 January 2010, reminding operators and maintainers of the importance of adhering to all current manufacturer's approved data for cooling fans manufactured from sheet metal and their drive assemblies. CASA also advised that the European Aviation Safety Agency (EASA) has identified AWB 63-007 for wider distribution.
The Civil Aviation Safety Authority (CASA) has advised that it will review the requirements for initial pilot training and endorsement and recurrent training on all helicopters. This will include a review of the Helicopter Flight Instructors Manual.
CASA has advised the ATSB that the proposed CASR Part 142 is under review as a matter of priority and has now been progressed to the Office of Legislative Drafting and Publishing.
In its response to this safety issue, CASA advised that: CASA agrees there is evidence of confusion regarding the qualifications required to supervise an Ag2 rated pilot. Civil Aviation Safety Regulation (CASR) 137 and Civil Aviation Order (CAO) 40.6 are not directly related or interactive legislative components and must therefore be dealt with and considered separately. The following explains: CASR 137 - is applicable to a person applying for or who holds an Air Operator Certificate (AOC) authorising "aerial application operations - other than rotorcraft". This means aeroplanes only. In other words, it is the how to do business and flying operations regulations for aeroplane aerial application operators. There is no relevant CAO for aeroplane aerial application AOC holders as CASR 137 has already superseded CAO 20.21 is this regard for aeroplanes. CAO 20.21 - is applicable to "aircraft engaged in agricultural operations" not aircraft engaged in "aerial application operations" (refer CASR 137). However, CAO 20.21 is still applicable to helicopters as CASR 137 does not refer to helicopter aerial application operations as yet. In other words, it is the how to do business and flying operations directions for helicopter agricultural operators and therefore CAO 20.21 cannot be repealed until CASR 137 includes rotorcraft. CAO 40.6 - is a set of directions issued under sub regulation 5.14(1), regulations 5.16 and 5.18 of Civil Aviation Regulations (CAR) 1988 for the purposes of describing the flight tests that must be passed, other requirements that must be satisfied, the authority given by and the limitations of that authority for people who wish to train persons for the issue of and obtain an agricultural rating in either aeroplanes or helicopters. In other words, it is a set of ground and flying training, flight testing and limiting directions empowered by CAR 1988 Part 5. Therefore, it is the how to do business and flying operations regulations for ALL providers of "agricultural flying training" and not directly linked to CASR 137, other than 137 requiring an operator to ensure their pilots are correctly qualified. The supervision requirements in CAO 40.6 are risk mitigators for new AG rating holding pilots, added for the same reasons new flying instructor rating holding pilots require supervision as outlined in CAO 40.1.7 (instructor ratings aeroplanes) and CAO 40.3.7 (instructor ratings helicopters). CASA intends to promulgate information and provide education to industry to clarify the requirements in CASR Part 137 and CAO 40.6.
During the investigation, the ATSB alerted the Civil Aviation Safety Authority (CASA) of this safety issue. As a result of those discussions, CASA issued Airworthiness Bulletin AWB 72-003 Issue 1, Rolls Royce 250 Engine Outer Combustion case (OCC) Failure dated 23 October 2008 (Appendix B). The AWB sought to urgently advise operators and maintainers of the possibility of an unusual and catastrophic failure of the combustion case in that engine type, and to recommend a means and periodicity for the inspection of that area of
CASA has advised that the Visual Flight Guide has been withdrawn for amendment.
The Civil Aviation Safety Authority (CASA) identified that, under the current system of maintenance applicable to AW139 helicopters on the Australian register, compliance with a manufacturer's SB is not mandatory in all circumstances. Compliance is only mandatory for aircraft on the Australian register if an Airworthiness Directive (AD), issued by the National Airworthiness Authority (NAA) responsible for the type design of the aircraft, calls for compliance with a manufacturer's SB. At the time of writing, no such AD had been issued regarding compliance with SB 139-166. Following this occurrence, CASA contacted the relevant NAA and ascertained that the NAA intends issuing an AD that will mandate compliance with SB 139-166. CASA is presently monitoring the development of this directive and, in the event that the relevant NAA does not issue the AD, CASA will consider if the issue of an Australian AD is warranted.
As a result of this safety issue, the Civil Aviation Safety Authority (CASA) presented a submission to the International Civil Aviation Organization instrument flight procedures panel. The submission highlighted the potential for ambiguity in the interpretation of the standards for the design of omnidirectional Standard Instrument Departures. The intent of the submission was to raise awareness of the issue and to seek changes to improve the consistency of the relevant PANS-OPS guidance material. In the interim, CASA has taken action to clarify the purpose of the rectangular areas to the sides of the runway and to provide additional procedures – including the provision of obstacle lighting to ensure obstacle clearance during instrument departures – to address the risk of a collision with
The Civil Aviation Safety Authority (CASA) has advised that it has reviewed the guidance in Civil Aviation Advisory Publication 5.81-1(0) Flight Crew Licensing Flight Reviews concerning the conduct of navigational exercises during an Aeroplane Flight Review. CASA will amend the CAAP to recommend that a navigational exercise is considered for inclusion in an AFR. The frequency of those navigational exercises will also be addressed.
The Civil Aviation Safety Authority (CASA) has advised the ATSB that, as a result of this occurrence: CASA will review, with operators, their oversight responsibilities in this area. The air operator is responsible for all activities conducted under its Air Operators Certificate, including contracted training.
CASA has advised the ATSB that the proposed Civil Aviation Safety Regulation (CASR) Part 142 is under review as a matter of priority and has been progressed to the Office of Legislative Drafting and Publishing. In addition, in July 2009, CASA issued a Civil Aviation Advisory Publication (CAAP)24 that provided guidance to the aviation industry in regard to competency based training.
Airservices Australia advised the Australian Transport Safety Bureau that they intend to review the procedure relating to line-up and wait instruction to ensure MATS is aligned to ICAO Doc 4444 as per CASR 172.090. Any changes will be implemented in the MATS amendment in August 2009.

ATSB Response
The ATSB is satisfied that the action implemented by Airservices Australia, in conjunction with the change of GAAP aerodromes to Class D that was implemented by the Civil Aviation Safety Authority on 3 June 2010 (see the following section titled Civil Aviation Safety Authority) will adequately address the safety issue.
The ATSB is satisfied that the action taken by Airservices adequately addresses the safety issue.
The ATSB is satisfied that the action taken by Airservices Australia has adequately addressed the safety issue.
The ATSB is satisfied that the proposed action to be taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that, depending on the outcome of CASA's review, it could be expected that any action taken by CASA would address the safety issue.
The action taken by CASA appears to adequately address the safety issue.
The ATSB is satisfied that the proposed action by CASA will, when complete, adequately address the safety issue.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action taken by CASA will adequately address the safety issue.
The ATSB is satisfied that the action taken by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action proposed by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action proposed by CASA adequately addresses the safety issue.
The action taken by Airservices Australia appears to adequately address the safety issue.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2007-002	Significant	25/06/2009	30/06/2009	5	Proactive safety action	Airservices Australia
AO-2008-020	Minor	25/06/2009	3/08/2010	404	Proactive safety action	Airservices Australia
AO-2008-077	Minor	9/12/2009	9/12/2009	Action completed during investigation	Proactive safety action	Airservices Australia
AO-2008-033	Minor	30/06/2009	30/06/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-046	Significant	22/12/2009	14/07/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2008-077	Minor	9/12/2009	9/12/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-066	Significant	25/06/2009	25/06/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-066	Significant	25/06/2009	22/09/2009	89	Safety Recommendation	Civil Aviation Safety Authority
AO-2008-068	Minor	20/11/2009	20/11/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2009-005	Minor	7/07/2009	7/07/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-036	Significant	28/07/2009	28/09/2010	427	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Minor	8/07/2009	24/11/2010	504	Proactive safety action	Civil Aviation Safety Authority
AO-2008-033	Significant	30/06/2009	30/09/2009	92	Safety Advisory Notice	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	5/07/2012	1093	Proactive safety action	Civil Aviation Safety Authority

Safety Finding
SCARD process open to flaws
Tower closure - no PAL
No requirement to provide wake turbulence separation
Existing threshold markings not obscured
numerous V-belt failure accidents
No requirement to provide wake turbulence separation
Third party risk analysis
Third party risk analysis
Worn pitch link sperical bearing - non detection
Guidance re non sighting of preceding traffic
Absence of crosscheck in checklist
Operator unaware of important safety info
Flight crew do not identify closed runway markings
Requirements for endorsement training

Safety Issue
The Airservices SMS did not require an independent review of the locally-conducted hazard assessment process.
The control tower procedures did not require that the pilot activated lighting be switched on for aircraft that would be departing or arriving soon after the tower was closed.
There was no requirement for wake turbulence separation to be provided by Air Traffic Control in respect of aircraft operations on the adjacent parallel runway.
The existing runway 21 threshold and touchdown markings were not required to be obscured and were clearly visible to the flight crew. Those markings continued to provide approach and landing cues to the normal touchdown zone, which was located within the runway works area
V-belt failure or dislodgement was identified as a factor in a number of overseas and Australian R22 accidents.
There was no requirement for wake turbulence separation to be provided by Air Traffic Control in respect of aircraft operations on the adjacent parallel runway.
CASA did not seek information to establish whether there was ‘evidence of risk to third parties on land, sea or air’ prior to issuing the Special Certificate of Airworthiness.
CASA did not seek information to establish whether there was ‘evidence of risk to third parties on land, sea or air’ prior to issuing the Special Certificate of Airworthiness.
It was probable that bearing wear outside of maintenance manual limits existed, but was not be detected, during the most recent ALF inspections
The operator did not provide guidance, and there was no generally available guidance, to pilots regarding the appropriate course of action should preceding traffic in the circuit not be sighted before the final approach is intercepted.
During the checklist procedure, the copilot would call the check item and then the copilot would check it. There was no crosscheck required by the pilot in command.
The aircraft operator was not aware of important safety related information regarding the EMB-120 fuel system.
The use of the 6 m closed runway markings in lieu of the recommended 36 m markings increased the risk of a flight crew conducting a visual approach to the permanent threshold/touchdown area.
The minimum requirements for endorsement training where simulator training was not involved did not ensure pilots were aware of indicators and/or aircraft behaviour during critical emergency situations.

Organisation Response
Airservices Australia (Airservices) advised that, as part of its hazard assessment process: Workshops were facilitated in Brisbane by Canberra based Safety Management staff, giving a level of independence to the hazard identification and risk assessment process. In addition, the Tops risk register was also considered by Safety Management as it was a contributor to the overall picture of the level of risk. Notwithstanding the above, Airservices has a model of using independent risk specialists from Safety and Environment as facilitators for significant risk activities, thus providing a level of oversight and expertise.
Airservices Australia have advised that they will review tower closing procedures with a view to standardising the procedure and confirming the operation of pilot activated lighting (PAL). Any change in procedure will be included in the National Air Traffic Control Procedures Manual.
In response to this occurrence, Airservices Australia (Airservices) conducted a review of parallel runway operations at Sydney involving the Airbus Industrie A380 800. Airservices subsequently issued the following instruction to controllers: Parallel Approach Limitations When a Super wake turbulence category aircraft is making an approach to a parallel runway, provide wake turbulence distance separation to the adjacent runway when the aircraft making an approach to the adjacent runway has a MTOW less than 25,000 kg.
During the development of this draft report, the ATSB met with CASA officers to discuss the possible safety benefits of the use of the International Civil Aviation Organization (ICAO)-recommended 36 m closed runway markings in Australia when the affected permanent threshold and touchdown markings were not required to be obscured. In response to that meeting and the Directly Involved Party process (see Appendix C) CASA advised that, 'any changes to runway marking standards will be subject to mandatory consultation with industry. The proposal for the use of the International Civil Aviation Organization (ICAO) recommended 36 m closed runway markings will be incorporated into the Part 139 amendment work program.'
In response to a number of R22 helicopter rotor drive system failures, on 14 August 2009, the Civil Aviation Safety Authority (CASA) issued airworthiness bulletin, AWB 63-006 Issues related to the Robinson Helicopter Corporation (RHC) R22 main rotor drive system. The purpose of the bulletin was to: a. Provide Operators and Maintainers' a consolidated summary of investigations carried out by CASA Airworthiness Specialists based on several information resources including CASA received SDRs, b. to remind maintainers and operators of the need to strictly adhere to the requirements of all current RHC approved data for the operation and maintenance of the R22, and c. provide a guide to the information available, including RHC data in relation to main rotor drive system with emphasis on the main rotor drive veebelts (also known as the main drive belts). CASA also advised that future relevant operational information regarding rotordrive systems failures would continue to be disseminated through advisory material and Directives
In response to this occurrence, the Civil Aviation Safety Authority has opened a regulatory change project to review and update wake turbulence separation information in the Manual of Standards Part 172.
In its response to this safety issue, CASA provided the following reponse to the ATSB on 1 June 2009: I refer to your email dated 15 May 2009 regarding a further draft of Transport Safety Report AO-2007-066. I understand CASA has already provided comments on the safety management issue for the pilot. However, the current draft of the report appears to have broadened this issue to include other persons ie "CASA did not seek information to establish whether conditions '...necessary for the safety of other airspace users and persons on the ground or water'" were required prior to issuing the Special Certificate of Airworthiness. In CASA's view the new safety issue is irrelevant to the accident because no other airspace users and persons on the ground and water were affected. The person who was fatally injured was the pilot, a participant and fully aware of the risk. CASA did not seek information'...necessary for the safety of other airspace users and persons on the ground or water' were required prior to issuing the Special Certificate of Airworthiness, because it based the safety determination on the information submitted by the applicant initially as part of the application and subsequent flight test plan. This information and the conditions set out on the Special Certificate of Airworthiness and other required operational approvals (low level flight over water) are intended to ensure the safety of other airspace users and persons on the ground or water. In those cases where such inquiries are or might be relevant, CASA will not hesitate to make them and formulate and impose such additional conditions (if any) as may be necessary in the interest of safety, on that basis.
Thank you for the copy of your Final Report on the above occurrence, and the formal safety recommendation included in that Report. You have recommended that CASA address the safety issue that, when considering the issue of future Special Certificates of Airworthiness in the experimental category, CASA needs to be able to assure itself that adequate information is gathered to enable an informed decision on the conditions '... necessary for the safety of other airspace users and persons on the ground or water'. In its response to the ATSB on 1 June 2009, CASA stated that it did not seek information to establish whether conditions .. .. .'necessary for the safety of other airspace users and persons on the ground or water were required prior to issuing the Special Certificate of Airworthiness, because it based the safety determination on the information submitted by the applicant initially, as a part of the application and subsequent flight test plan. Beyond this, and despite further advice from CASA to the engineer involved regarding the potential risk to other parties, CASA contended that this information and the conditions set out on the Special Certificate of Airworthiness, in addition to other legislative provisions and required operational approvals, were sufficient to ensure the safety of other airspace users and persons on the ground or water. CASA has now reconsidered its initial response with due regard to the ATSB's safety recommendation (SR-081) as it applies to the issue of future Special Certificates of Airworthiness in the experimental category. In future, CASA will provide further advisory material designed to ensure that adequate information is made available to enable an informed decision on the conditions'...necessary for the safety of other airspace users and persons on the ground or water'. CASA has initiated development of a Senior Management Instruction (SMI), an internal staff guidance document, which will include relevant text and checklists to provide updated guidance and advice on this subject. This information will be published by the end of November and will be included in the Certificate of Airworthiness and Special Flight Permits Manual at an appropriate time.
As a result of this incident, the Civil Aviation Safety Authority released Airworthiness Bulletins 27-009 Issue 2 (AS 350) and AWB 27-010 Issue 1 (AS 355 and AS 550) on 10 October 2008. The purpose of those bulletins was to remind operators, pilots and maintainers of inspection requirements relating to the tail rotor pitch change links and the importance of frequently checking for pitch link wear.
In response to the recommendations of the GAAP Training Review, CASA developed a number of safety cards that included the following guidance regarding an effective lookout: Ensure you sight any preceding traffic before turning finals, otherwise consider going
On 16 June 2009, CASA advised the following: CASA will follow up with the operator regarding their action on "4.1.2 Inadequate checklist procedures to verify position of switches" and "4.1.3 Absence of crosscheck in checklist".
On 28 April 2009, CASA advised: The CASA Communication (CASACom) publication, previously known as the Air Transport Communication (ATCom) has been developed to allow the Civil Aviation Safety Authority to promptly communicate identified safety and operational issues to all Air Operator Certificate holders and is available on the CASA website.
Action taken by CASA During the development of this draft report, the ATSB met with CASA officers to discuss the possible safety benefits of the use of the International Civil Aviation Organization (ICAO)-recommended 36 m closed runway markings in Australia when the affected permanent threshold and touchdown markings were not required to be obscured. In response to that meeting and the Directly Involved Party process (see Appendix C) CASA advised that, 'any changes to runway marking standards will be subject to mandatory consultation with industry. The proposal for the use of the International Civil Aviation Organization (ICAO) recommended 36 m closed runway markings will be incorporated into the Part 139 amendment work program.'
On 28 April 2009, CASA advised as follows: CASA has identified that there is a risk of interpretive conflict within [Civil Aviation Order] CAO 40.1.0. As a result, this CAO is under review to identify further areas of similar risk. Once complete, the results of this review will be dealt with at the Executive level of CASA. In amplification of its response, CASA advised that the reference to 'interpretative conflict' related to the requirements in CAO 40.1.0 that made reference to aspects associated with aircraft complexity (including familiarity 'with the systems, the normal and emergency flight manoeuvres and aircraft performance, the flight planning procedures, the weight and balance requirements and the practical application of take-off and landing charts of the aircraft to be flown') compared to the minimum conditions (flying time) for acting as pilot in command and co-pilot (see 1.16.1). On 21 September 2011 CASA provided the following update: Civil Aviation Order (CAO) 40.1.0 prescribes the requirements for the grant of aeroplane endorsements. It includes minimum aeronautical experience and syllabus of training standards for a number of endorsements. In addition, CASA is required to approve a course of training for an endorsement when minimum experience has been specified for the grant of the endorsement and the syllabus of training in the Appendix must be satisfied.The risks associated with interpretive conflict related to the requirements of CAO 40.1.0 are mitigated by the requirement by CASA Operations for the appointment of a type specialist to approve an application for a training course for more complex aircraft types. While the requirement in the CAO are broad, CASA appoints a type specialist to approve an application for a training course for more complex aircraft types. Where a flight simulator is available in Australia for the aircraft type, CASA recommend the use of such devices incorporated into a training course for the aircraft type. CASA has established a project to consider the compulsory use of flight simulators in endorsement training and proficiency checking where the devices are available recognising the safety and quality benefits of using such devices in aircraft training. The CASA type specialist may determine that the training course may be conducted using the aircraft alone for some aircraft types or require the use of a flight simulator to satisfy the syllabus of training. The introduction of Parts 61 and 141 (and the mandatory simulator reg changes) will also address the original issue.The implementation of CASR Part 61 will introduce the requirement for all crew members to hold equivalent aircraft qualifications. There is no provision for a co-pilot aircraft qualification, pilots will be expected to satisfy the same standards for the grant of the aircraft type rating. Training for a Type rating will be conducted by a Part 141 Flight Training Operator authorised to conduct the training for the Type Rating by appropriately qualified Instructors. The training must be approved by CASA and satisfy the standards specified in the Part 61 Manual of Standards (MOS) for a Type rating. At the completion of the course of training the applicant for the Type rating must complete a flight test conducted by a Flight Examiner. Where the flight test standards cannot be safely conducted in an aircraft, a flight simulator must be used for the exercise. Project OS09/14 Mandatory use of Simulators - Following industry comment to the NPRM a full impact assessment conducted by the CASA regulatory impact analyst is being completed and CASA is expecting to publish a revised policy in the form of a CAO late September 2011 prior to publishing the NFRM.

ATSB Response
The ATSB acknowledges the technical imperatives for the decision by Airservices to remove the military radar information from The Australian Advanced Air Traffic System (TAAATS), and that a number of safety activities were undertaken following removal of the radar data. However, the lack of an independent review of the locally-conducted hazard assessment process, and the implications for the overall SMS, remained of concern. The ATSB will continue to monitor the application of the Airservices SMS within the context of future relevant investigations.
The ATSB is satisfied that the action taken by Airservices adequately addresses the safety issue.
The ATSB is satisfied that the action taken by Airservices adequately addresses the safety issue.
The ATSB acknowledges the commitment by CASA to consult with industry as a part of the Part 139 amendment work program. The ATSB will continue to monitor CASA's progress in addressing this safety issue when reviewing similar occurrences that may occur in the future.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The potential for risk to other parties in relation to the experimental flight test was identified by CASA in its advice to the engineer of 29 November. If there had beendue consideration of that potential risk in the operator's application for a Special Certificate of Airworthiness and 'subsequent flight test plan', then the additional advice to the engineer, which was provided after the issue of the certificate, would not have been warranted. When considering the issue of future Special Certificates of Airworthiness in the experimental category, CASA needs to be able to assure itself that adequate information is gathered to enable an informed decision on the conditions '...necessary for the safety of other airspace users and persons on the ground or water'.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The action taken by CASA and the aircraft operator appears to adequately address the safety issue.
The ATSB notes the action proposed by CASA and will continue to monitor this safety issue.
The action taken by CASA appears to adequately address the safety issue.
The ATSB acknowledges the commitment by CASA to consult with industry as a part of the Part 139 amendment work program. The ATSB will continue to monitor CASA's progress in addressing this safety issue when reviewing the Part 139 amendments.
The ATSB acknowledges the information provided by CASA. The ATSB will monitor the progress of the review of CAO 40.1.0. NB: This safety issue has been closed, as CASA has advised the ATSB that the issue is addressed in the proposed CASR Part 141/142 changes that are to be issued.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2008-032	Significant	24/06/2009	21/04/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2009-005	Minor	7/07/2009	7/07/2009	Action completed during investigation	Proactive safety action	Civil Aviation Safety Authority
AO-2007-002	Significant	25/06/2009	31/03/2010	279	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	16/11/2010	496	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	16/11/2010	496	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	27/06/2012	1085	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	27/06/2012	1085	Safety Recommendation	Civil Aviation Safety Authority
AO-2007-036	Significant	28/07/2009	28/09/2010	427	Proactive safety action	Civil Aviation Safety Authority
AO-2007-017	Significant	8/07/2009	21/08/2009	44	Proactive safety action	Civil Aviation Safety Authority
AO-2007-049	Significant	29/01/2009	6/02/2009	8	Proactive safety action	Civil Aviation Safety Authority
AO-2007-005	Significant	17/06/2008	18/06/2008	1	Proactive safety action	Airservices Australia
AO-2007-048	Significant	20/06/2008	3/12/2009	531	Proactive safety action	Airservices Australia
AO-2005-001	Significant	4/04/2007	28/09/2009	908	Safety Recommendation	Airservices Australia

Safety Finding
Cable damage not identified during last inspection
ERSA CTAF(R) circuit limit
SCARD process open to flaws
Regulatory guidance for fuel cross-check
Regulatory guidance for fuel cross-check
Simulator training in Australia
Simulator training in Australia
Simulator training in Australia
Inadequate checklist procedures to verify position
Operator's pilots practices for fuel measurement
CASA fuel quantity cross-check guidance
Brisbane controller not aware that runway closed
No requirement for controller to restate altitude
Terrain information on Airservices charts

Safety Issue
The control cable inspection regime used by maintenance personnel was insufficient to identify the developing cable fatigue damage, even though it was likely the cracking was well advanced and should have been detected during the last 100-hourly inspection.
The limit of five aircraft in the circuit during Common Traffic Advisory Frequency - carriage and use of radio required, CTAF (R), operations at certain airports was not well defined, resulting in potentially more aircraft operating in the circuit than intended.
The Airservices SMS did not require an independent review of the locally-conducted hazard assessment process.
Regulatory guidance regarding the measurement of fuel quantity before flight lacked clarity and appropriate emphasis and did not ensure that the fuel quantity measurement procedures used by operators included two totally independent methods.
Regulatory guidance regarding the measurement of fuel quantity before flight lacked clarity and appropriate emphasis and did not ensure that the fuel quantity measurement procedures used by operators included two totally independent methods.
There was no regulatory requirement for simulator training in Australia
There was no regulatory requirement for simulator training in Australia
There was no regulatory requirement for simulator training in Australia
The checklist procedure did not require flight crew to touch the switches of the fuel pumps to ensure that they were aware of the position of the switches.
The practices used by the operator’s pilots for measuring and logging of fuel quantity were inconsistent.
Guidance promulgated by the Civil Aviation Safety Authority in Civil Aviation Advisory Publication 234-1 regarding aircraft fuel requirements allowed for a fuel quantity cross-check to be conducted after refuelling and without reference to an independent source of fuel quantity information.
The controller’s briefing was not printed in accordance with the Local Instructions and did not include a complete list of relevant NOTAMs. As a result, the Brisbane controller was not aware that the runway was closed and could not alert the pilot of this fact.
There is no requirement for a controller to confirm that descent below a previously assigned altitude has not been given in a clearance to a circuit position that does not include a visual approach clearance.
R20070011 Airservices Australia’s instrument approach charts did not depict the terrain contours on the plan-view. They also did not depict the terrain profile on the profile-view, although the segment minimum safe altitudes were depicted. The ATSB recommends that Airservices Australia should address this safety issue.

Organisation Response
The Civil Aviation Safety Authority has published an Airworthiness Bulletin (AWB27-011) highlighting the circumstances surrounding the cable failure sustained by VH-MWY, and recommending: - All flight control cables in American Champion Aircraft models be immediately inspected for damage. - Operators consider replacing control cables that cannot be traced to MIL-DTL-83420 certification. - Where required by aircraft maintenance documentation, flight control cables be periodically inspected i.a.w. FAA AC 43-13-1B chapter 7, section 8, paragraph 7.149d, and the manufacturer's approved data.
The limit for five aircraft in the circuit outside of tower hours was documented in ERSA [En route Supplement Australia]. It is not clear from the report why the school did not comply with these guidelines. The statements “A MAX of 5 ACFT are permitted in the circuit at any one time” and CTAF(R) radio carriage and use requirements do not seem ambiguous or unclear. A number of these issues relating to operations at such aerodromes will be addressed in the findings of CASA’s GAAP reviews.
The Civil Aviation Safety Authority (CASA) advised that: The [Civil Aviation Safety Regulation] CASR Part 172 audit implications of this report have been drawn to the attention of the CASA air traffic services specialist surveillance staff for future reference.
On 26 September 2008, CASA advised: The status of CASA's review of its guidance material relating to separate processes for fuel quantity measurement checks. The second edition of the Air Transport Communication (AT com) advised of impending amendments to Civil Aviation Advisory Publication (CAAP) 234. In amending CAAP 234, clear guidance will be given to industry regarding the two independent means of ensuring the correct amount of fuel is onboard an aircraft. The amended CAAP 234 will emphasise the responsibilities of the Pilot-in-Command and the operator in adhering to the manufacturer's guidance in determining the amount of fuel onboard an aircraft. CASA would like to emphasise the point that crews utilise all means provided by the manufacturer to ascertain correct fuel quantity. In this instance there was a manufacturer's recommended procedure that aircraft fuel quantity is independently confirmed using a separate facility incorporated into the aircraft. Had this crew followed that guidance, the incident would not have experienced its near catastrophic outcome. The second edition of the AT com advised industry that changes to CAAP 234 were forthcoming. The AT com is intended as an informal means of raising topical issues inclusive of alerting operators of intended changes. CASA is not reliant on it to convey the information as variations documentation is undertaken through our formal process. The process of amending CAAP 234 is currently being undertaken and this involves detailed consultation with various stakeholders. A summary of any changes to CASA regulatory oversight activities relating to fuel management or fuel quantity cross-checking processes Fuel quantity cross-checking processes have been added as a distinct element within operational surveillance activities. Where a deficiency in the fuel cross checking procedures is identified, it is raised with the operator. The matter remains under close scrutiny until resolved to the satisfaction of CASA.
Civil Aviation Safety Authority
A summary of CASA activities to facilitate the use of full flight simulators and/or flight training devices follows: The following inter-related activities are in the process of implementation: • A combined workshop activity with Ansett Aviation Training, Capiteq Limited trading as AirNorth, Network Aviation Pty Ltd, Skippers Aviation Pty Ltd, PelAir Aviation Pty Ltd and CASA was held on 27, 28 April 2009. • CASA has initiated a review of CAR 217 Training Organisations and Training Centres. This programme of review was prompted following investigations that revealed AOC holder training inconsistencies. • A Component of the 'CAR 217 Training Organisations and Training Centres Special Emphasis Review' is to establish the level of company oversight and involvement with training and simulation, programmes that have been outsourced.
A summary of CASA activities to facilitate the use of full flight simulators and/or flight training devices follows: The following inter-related activities are in the process of implementation: •A combined workshop activity with Ansett Aviation Training, Capiteq Limited trading as AirNorth, Network Aviation Pty Ltd, Skippers Aviation Pty Ltd, PelAir Aviation Pty Ltd and CASA was held on 27, 28 April 2009. •CASA has initiated a review of CAR 217 Training Organisations and Training Centres. This programme of review was prompted following investigations that revealed AOC holder training inconsistencies. •A Component of the 'CAR 217 Training Organisations and Training Centres Special Emphasis Review' is to establish the level of company oversight and involvement with training and simulation, programmes that have been outsourced. •Civil Aviation Order 40.2.1 - Instrument Rating, Section 12A, `Renewal using an overseas flight simulator training provider' has been added to include the option of instrument proficiency checks being conducted by an overseas simulator provider. This is to enable an instrument rating renewal where a specific type simulator is not available in Australia: ?This amendment needs to read in conjunction with Advisory Circular AC 60-2 (1) of May 2007; ?The Advisory Circular identifies that CASA recognises the flight simulator qualifications certificates issued by Canada, Hong Kong (Special Administrative Region of China), New Zealand, the United States of America, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom; and ?Civil Aviation Order 40.1.0 - Aircraft Endorsement - Aeroplanes, Section 6. This facilitates an option for instrument rating renewals to be associated with the issue of an aircraft
On 16 June 2009, CASA advised the following: CASA will follow up with the operator regarding their action on “4.1.2 Inadequate checklist procedures to verify position of switches” and “4.1.3 Absence of crosscheck in checklist".
On 3 July 2007, the Civil Aviation Safety Authority (CASA) issued a series of directions to the operator which addressed fuel quantity measurement procedures and flight crew training. In late 2007, CASA withdrew Airworthiness Bulletin 28-002.
The Australian Transport Safety Bureau briefed Civil Aviation Safety Authority (CASA) personnel on the circumstances of the occurrence. CASA advised that: • A Civil Aviation Regulation (CAR) 215 direction [WRA3130] had been issued to the operator to ensure that a secondary means of verification of fuel on board was used to cross check the electric fuel indication system. The Civil Aviation Safety Authority is also considering: • Advising Air Safety Auditors of the circumstances of the incident and the need for operators to have fuel quantity measurement procedures that provide a high level of assurance that the required fuel is actually on board an aircraft • Reviewing the information in Civil Aviation Advisory Publication 234-1(1) Guidelines for Aircraft Fuel Requirements that refers to fuel quantity cross-checking In late 2007, CASA withdrew Airworthiness Bulletin 28-002.
Brisbane local instructions were reviewed and changed to ensure that the printed list of NOTAMs was not truncated. Subsequently, ‘the system used at that time has since been decommissioned and briefing material is now sourced directly from NAIPS which enables downloads to process much faster. Subsequent testing has shown that it is practically impossible to open the print dialogue button before the information has fully downloaded.’
Response from Airservices Australia The following advice in relation to the safety issue was received 15 April 2008 as part of Airservices’ response to the draft report: The common thread to this investigation and the other incident referred to in the body of the report is that this non-compliance occurred when given circuit entry and manoeuvring instructions. In both cases the crews believed they had been issued with a visual approach, apparently as a consequence of these instructions, when in fact no such clearance had been issued. This is also part of a wider issue regarding flight termination that includes visual approach clearances being issued to flights following a STAR procedure. Discussion in respect of the draft safety recommendation are ongoing within Airservices as a part of
We [Airservices Australia] are concerned that depicting terrain contours on the plan and profile of instrument approach charts may unintentionally create situations that adversely affect flight safety. One concern we have is that the inclusion of this information on the plan of the charts will create chart clutter, making the retrieval of flight critical data from these charts more difficult, with a possible degradation of flight safety. We are also concerned that providing pilots with more information than is required for them to fly the procedure profile could result in inappropriate use of the information. Instrument approach charts are designed to be used for instrument approach to the runway. If pilots fly the procedure profile and adhere to the published minimum safe altitudes for the various segments of the approach, aircraft will be protected from the underlying obstacles and terrain. Deviations below the profile are discouraged by the chart format with minimum altitude blocks shown below the profile. By also depicting the terrain contours on the chart profile, we would not like to create in pilot's minds the false impression that there is room to descend below the published minimum safe altitudes and still be protected from terrain. The Australian position in relation to the depiction of terrain contours on the plan and profile of instrument approach charts was developed in consultation with CASA. As the concerns we have in relation to operational flying and pilot behaviour are not wholly within our competency, Airservices will consult with CASA to determine the most effective safety outcome. | Further response from Airservices 19 March 2009: Airservices Australia plans to be ICAO complaint with the terrain requirements for Instrument and Approach Landing (IAL) charts, by the end of2009. To comply with the ICAO standards, only six aerodromes have been identified as requiring the inclusion of terrain. It should be noted that Lockhart River is not included. Airservices remains committed to partnering with the regulator, CASA, to further research human factors matters associated with IAL design and depiction of terrain; as aspects of pilot interpretation primarily rests with the intent of the regulatory standards that govern Procedures Design. Airservices is awaiting CASA's direction in this endeavour. | Further response from Airservices 22 January 2010: As expected and requested, Lockhart River RWY 12 RNAV GNSS procedure was the first aerodrome to have terrain included onto the aerodrome plate. This came into effect on 19 November 2009. Airservices Australia has now completed the remainder of the Lockhart River approaches, and those for Amberley, Flinders and Lord Howe Islands. These procedures will be published with an effective date of 11 March 2010. Initial progress has been slower than anticipated due to some cartography technical issues that we have now resolved. As advised last year, Airservices Australia will continue to work through the remaining locations on an ongoing basis, and can provide further updates to the ATSB if requested.

ATSB Response
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The ATSB recognises the potential for CASA‟s GAAP reviews to address this safety issue.
The ATSB appreciates the commitment by CASA to highlight the audit implications from this investigation of the requirements of CASR Part 172 with its air traffic services surveillance staff. The ATSB considers that action by CASA, when applied to its future audits, to be a positive step towards ensuring an effective Airservices SMS.
The ATSB is concerned that, at the time of publication of this report, the CAAP 234-1(1) amendment had still not been released. The ATSB will continue to monitor the progress of the CAAP review. In addition to the occurrence involving VH-XUE, the ATSB is aware of two other occurrences involving Australian-registered aircraft since January 2005 involving engine power loss due to fuel starvation in turboprop aircraft with a maximum take-off weight (MTOW) above 5,700 kg. In each case, the practices used by the flight crew to establish fuel quantity did not detect erroneous fuel quantity indications. The operators involved subsequently amended their procedures to include dripstick checks as a mandatory part of their procedures for establishing the quantity of fuel on board the aircraft. It is possible that there are other examples among turboprop operators of aircraft with a MTOW greater than 5,700 kg where the procedures used to determine the quantity of fuel on board the aircraft do not include independent, comparative checks of fuel quantity. On 14 September 2007, the ATSB issued AO-2007-017-Safety Advisory Notice-013, which stated: The ATSB suggests that all turboprop operators take note of the following safety issue and review their processes accordingly: The processes used by some turboprop operators for checking the fuel quantity on board prior to flight have not used two methods of sufficient independence. In particular, the practice of using a comparison of a gauge indication after refuelling with the gauge indication prior to refuelling plus the fuel added is not adequate to detect gradually developing errors in gauge indications. On 25 February 2008, the ATSB advised CASA and all Australian operators of EMB-120 aircraft of the investigation report regarding the EMB-120 engine power loss occurrence in Europe on 20 February 2008. In the meantime, the ATSB re-emphasises AO-2007-017-Safety Advisory Notice-013 (above), which was initially issued on 14 September 2007.
The ATSB is satisfied that the changes to CAAP 234-1(1) address the safety issue.
The activities undertaken by CASA appear to have facilitated increased use of simulators for endorsement and other training. However, the ATSB remains concerned that there is no regulatory requirement for simulator training when a suitable simulator is available in Australia.
The activities undertaken by CASA appear to have facilitated increased use of simulators for endorsement and other training. However, the ATSB remains concerned that there is no regulatory requirement for simulator training when a suitable simulator is available in Australia.
The ATSB notes the action proposed by CASA and will continue to monitor this safety issue.
On 3 July 2007, the Civil Aviation Safety Authority (CASA) issued a series of directions to the operator which addressed fuel quantity measurement procedures and flight crew training. In late 2007, CASA withdrew Airworthiness Bulletin 28-002. The ATSB is satisfied that the actions taken by CASA adequately addressed this safety issue.
The ATSB is satisfied that the action taken by the Civil Aviation Safety Authority adequately addresses the safety issue.
The ATSB is satisfied that the action taken by Airservices adequately addresses the safety issue.
The ATSB will monitor progress on Airservices Australia’s response to the safety issue.
In relation to recommendation R20070011, the ATSB recognises Airservices Australia's intention to comply with ICAO Annex 4 as meeting the intention of the recommendation. However, the ATSB would appreciate it if you could clarify the reasoning behind the statement in the Airservices response 'To comply with the ICAO standards, only six aerodromes have been identified as requiring the inclusion of terrain. It should be noted that Lockhart River is not included.' With respect to Lockhart River in particular, this conclusion appears to be inconsistent with the material presented on page 154 of the ATSB investigation report into the fatal accident near Lockhart River (200501977). That stated: The ICAO Annex 4 Aeronautical Charts stated: 11.7.2 Relief shall be shown in a manner best suited to the particular elevation characteristics of the area. In areas where relief exceeds 1 200 m (4 000 ft) above the aerodrome elevation within the coverage of the chart or 600 m (2 000 ft) within 11 km (6 NM) of the aerodrome reference point or when final approach or missed approach procedure gradient is steeper than optimal due to terrain, all relief exceeding 150 m (500 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall also be shown printed in black. ..... The Lockhart River Runway 12 RNAV (GNSS) approach had a final approach gradient greater than the optimum of 3 degrees, and the height of both North Pap (1,614 ft) and South Pap (1,453 ft) had relief higher than 500 ft above the Lockhart River aerodrome which had an elevation of 77 ft. Before we finalise and close this recommendation, it would be appreciated if you could confirm which six aerodromes were identified as requiring the inclusion of terrain and clarify the rationale for the conclusion that the Lockhart River RNAV (GNSS) approach to runway 12 does not meet the intention of Annex 4 as described above. | Further ATSB response March 2009: The ATSB recognises that Airservices Australia has now redesigned the Lockhart River runway 12 RNAV (GNSS) approach, and that the new approach chart, to be published in the Aeronautical Information Publication amendment on 19 November 2009, also included coloured terrain contour lines on the plan-view diagram (rather than spot heights only). The ATSB accepts that Airservices Australia has now met the intention of the safety recommendation and has closed this safety recommendation - action taken.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2005-001	Significant	4/04/2007	3/04/2009	730	Safety Recommendation	Airservices Australia
AO-2005-001	Significant	4/04/2007	28/09/2009	908	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	12/03/2009	708	Safety Recommendation	Civil Aviation Safety Authority

Safety Finding
RNAV (GNSS) approach chart design
GPWS alerts and warnings on normal approaches
CASA guidance for evaluating management systems

Safety Issue
R20060020 There were several design aspects of the Jeppesen RNAV (GNSS) approach charts that could lead to pilot confusion or reduction in situational awareness. These included limited reference regarding the ‘distance to run’ to the missed approach point, mismatches in the vertical alignment of the plan-view and profile-view on charts such as that for the Lockhart River runway 12 approach, use of the same font size and type for waypoint names and ‘NM’ [nautical miles], and not depicting the offset in degrees between the final approach track and the runway centreline. The ATSB recommends that the Airservices Australia should address this safety issue.
R20070008 Based on the available evidence, the Lockhart River Runway 12 RNAV (GNSS) approach design resulted in mode 2A ground proximity warning system alerts and warnings when flown on the recommended profile or at the segment minimum safe altitudes. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
R20070002 CASA did not provide sufficient guidance to its inspectors to enable them to effectively and consistently evaluate several key aspects of operator management systems. These aspects included evaluating organisational structure and staff resources, evaluating the suitability of key personnel, evaluating organisational change, and evaluating risk management processes. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.

Organisation Response

[The ATSB] raised the issue of improved charting standards to enhance pilot situational awareness with respect to the relationship between distance to run and distance to the next waypoint. The suggested task-needs analysis to understand how pilots use RNAV (GNSS) approach charts is related to Human Factors associated with operational flying and pilot behaviour. As this aspect of chart design is not wholly within our competency, Airservices will consult with CASA to determine how an appropriate analysis can be progressed for the most effective safety outcome. Regarding RNAV (GNSS) procedures in general, Airservices conducted an internal assessment of procedures in 2006 and has set up a review programme, starting this Spring, to look at those aerodromes with offset approaches and higher than optimum descent gradients to see what could be achieved more toward the optimum, especially as the RNAV (GNSS) criteria has recently changed with the latest amendment to PANS-OPS, 15 March 07. In addition to this review, Airservices will consult with CASA to explore whether the parameters procedure designers use (including segment lengths) can be further optimised and to consider pilot workload aspects of the design.
On Tuesday 22 May 2007 CASA conducted approaches to the Lockhart River aerodrome in a Fairchild Metroliner aircraft using the Ground Proximity Warning System GPWS). The test flights confirmed that the GPWS would not give terrain warnings during an instrument approach when the aircraft was on the correct profile, on track and within the speed range specified for the approach. This evidence calls into question the validity of the material cited by the ATSB regarding mode 2A ground proximity warnings. CASA believes that an instrument approach not flown in accordance with the published approach will potentially cause GPWS warnings, which if in instrument metrological conditions, should be heeded. CASA will examine this issue further. As stated above, a draft AC covering approach validaton procedures has been developed. | Further response by CASA 30 September 2008: On 11 August 2008, CASA and Airservices staff flew the Runway 12 RNAV GNSS approach with an aircraft fitted with a Garmin 430w GPS and TAWS-B. The first approach was flown using the 3.49 degree profile on autopilot. No terrain or 'pull-up' warnings were received. After flying the approach on profile, two lower than profile approaches were flown, below the cloud base (around 2500') along the laterally guided flight path. On each occasion the terrain warning and pull up functions of the TAWS sounded well before the significant ridges. It was also noted by the operating pilot that the approach was no more difficult to fly than any other he had experienced. As previously advised, the issue of Mode 2A warnings from TAWS A is recognised and has been experienced on approaches other than LHR; specifically Cairns VOR and Cooktown - NDB. That is a -characteristic of the TAWS, aircraft configuration and terrain:- It is an unavoidable issue if the aircraft is not correctly configured with steep terrain on the approach. There is nothing CASA can do to change this. With more experience of TAWS A CASA will develop relevant educational information for pilots. I have also attached, for your information, a more detailed report with recommendations for further CASA action. I understand that these outcomes have been communicated to your staff and that it has been agreed that TAWS A warnings could be experienced on a range of approaches besides RNAV GNSS depending on the aircraft configuration and the nature of terrain in the vicinity and was affected by any pilot decision to not fly the optimum profile as published. This is not a circumstance unique to Lockhart River or RNAV (GNSS) approaches.... Recommendations 1.The current LHR RNAV (GNSS) approach remain in place until a redesign is undertaken that includes the Baro-VNAV vertical approach profile. 2.That APV approaches be initiated as soon as practicably in Australia commencing with Baro-VNAV redesigns for existing RNAV (GNSS) approaches. | Further response by Airservices 18 September 2009: On 18 September 2009, Airservices Australia advised the ATSB that the Lockhart River runway 12 RNAV (GNSS) non-precision approach had been redesigned and flight validated. The flight validation was conducted with a TAWS-A equipped aircraft and the 'the procedure did not trigger terrain warnings'. The new approach will be published in the Aeronautical Information Publication amendment effective 19 November 2009.
We have been addressing a clear requirement to enhance CASA's 'frontline' surveillance workforce capability. The need to assess the safety related decisions taken by industry management meant we needed people with management or safety management expertise and experience to support those with technical experience as a pilot or engineer. This requirement was enhanced by the increasing use of safety management systems (SMS) in aviation worldwide and the impending mandating of SMS for Australian aviation. CASA deployed its first safety system specialists in mid 2006, a capability that will have a particular focus on assessing regional airline safety management capability. | Further response by CASA 23 March 2007: CASA has, and continues to provide substantial guidance material in all aspects of surveillance. Inspectors are highly experienced and call upon professional judgement in assessing effectiveness of operators. Inspectors are recruited on the basis of this experience and professional judgement and are required to carry out their duties in accordance with surveillance guidance material provided by CASA. | Further reponse by CASA 1 June 2007: Whilst CASA acknowledges the thrust of this recommendation, CASA does not accept the underlying premise that CASA inspectors had insufficient guidance to fulfil their responsibilities. Furthermore CASA does not support the categorisation of this recommendation as a contributing safety factor at paragraph 3.2.4. CASA currently has a major project underway to improve oversight of the aviation industry In 2006, CASA created a new capability to evaluate industry management systems, employing three Safety Systems Specialists. These specialists have a different skill set to that of the existing spectors and auditors employed byCASA. CASA sought and obtained additional funding from the government and it is envisaged that a further nine Safety Systems Specialists will be employed by the end of 2007. The Safety Systems Specialists will write guidance and procedures for CASA staff whose responsibilities include evaluating management systems, to ensure effectiveness and consistency. | Further response from CASA 8 October 2008: The Safety System Specialists continue to provide guidance and development of staff in evaluating management systems. While the SSS are primarily concerned with the methods and guidance, CASA and ATOG in particular now has another type of Inspector - the Air Transport Inspector, and the primary role of these new assets is to provide the safety management perspective to CASA Surveillance and audit teams. There are currently 8 Air Transport Inspectors and these numbers are to be increased shortly. They are spread throughout the field offices but the resources are not geographically restrained and work with permissions holders as required on a risk basis. The ATIs work closely with and are developed and guided by the SSS. There is now a Safety Systems Specialist in each Air Transport Field Office as well as Safety Systems Specialist in the strategy roles in CASA's Air Transport Operations Group. All Safety Systems Specialist and Air Transport Inspectors meet on a regular basis for standardisation and to work together in developing further guidance material. The Industry Oversight Project is providing tools for Safety Systems assessment which include specific guidance for each assessable item, down to the level of word pictures to qualify the assessment of the system controls in place. The tool is being developed as an integrated part of the safety performance verification tools and is closely tied to the Regulatory development of Part 119 that is taking place

ATSB Response
The ATSB notes the response from Airservices Australia and will monitor progress. The ATSB will review the status of this recommendation in approximately 6 months.
Evidence in support of this recommendation at the time of the issue of the final report on 4 April 2007 included that Honeywell had conducted Lockhart River Runway 12 RNAV (GNSS) approach simulations (using groundspeeds typical of a Category B and C aircraft) for the constant angle approach along the recommended 3.49 degree profile and a step-down approach along the segment minimum safe altitudes (see page 68 and Appendix C of the final report). The simulations indicated that mode 2A alerts and warnings should be generated during both the constant angle and step-down approaches at both speeds when in the approach flap configuration. These alerts and warnings occurred in the vicinity of South Pap. The final report also included information on reports received by the ATSB following the accident involving VH-TFU from the pilots of two aircraft, that they could not conduct the Lockhart River Runway 12 RNAV approach without the GPWS announcing 'terrain terrain pull up pull up'. This was reported to occur in both aircraft types (one was a Category B performance aircraft and the other Category C). The occurrence was always after passing LHRWF inbound and the pilots reported that the warnings had occurred while the aircraft were on the published constant angle approach path with the autopilot coupled to the flight management system, in the approach configuration, and within the appropriate approach speeds for the aircraft category. The report also noted the report from a pilot of another operator who recalled conducting a runway 12 RNAV (GNSS) approach soon after the procedure was published. He stated that the approach was flown with the autopilot coupled to the flight management system, which had calculated a constant angle approach path. The pilot reported that the GPWS did not generate any alerts or warnings. The ATSB was unable to confirm the aircraft configuration or the calculated constant angle approach used on that occasion. The ATSB has subsequently received a further report of EGPWS warnings and alerts being activated when flying the normal approach profile for the Lockhart River Runway 12 RNAV (GNSS) approach (as advised to CASA by e-mail on 31 May 2007). Specifically, on 29 May 2007, the crew of a Super King Air 350 was on the approach when the EGPWS system generated both a 'terrain terrain' alert and 'pull up' warning when the aircraft was in the vicinity of South Pap. The crew reported that the published constant angle approach was being flown with the autopilot engaged in a flight management system mode which was providing vertical guidance with the crew cross-checking the altitudes with the approach chart. The crew conducted a go-around and missed approach manoeuvre and attempted a second approach. During the second approach, flying the same constant angle approach, the same alerts and warnings were heard. Given the evidence gathered during the investigation, the subsequent report from the crew of the Super King Air 350, and the results of the test flights conducted by CASA on 22 May 2007, the ATSB has initiated an investigation into the conduct of Lockhart River runway 12 RNAV (GNSS) approaches as a transport safety matter, as defined in Section 23(2) of the Transport Safety Investigation Act 2003. As part of that process, the ATSB would appreciate a copy of the Flight Data Recorder (FDR) data relating the test flights conducted by CASA on 22 May 2007 (Section 32 Notice to be provided separately as per normal procedure through CASA Corporate Relations). Noting that CASA is also examining this issue further, the ATSB has classified the status of this recommendation as 'Monitor'. | Further response by ATSB September 2008: The ATSB is concerned that the flight test did not provide a true validation test as the TAWS Class B (TAWS-B) as fitted to the test aircraft is a reduced capability system aimed at reducing the cost of the equipment for use in general aviation. The primary difference between TAWS-A and TAWS-B is that TAWS-B does not include the basic GPWS components, which are dependent upon a height input from a radio altimeter. As such, it is our understanding that the aircraft was not appropriately equipped to conduct flying to validate (or otherwise) the activation of the ground proximity warning system mode 2A warnings that was the subject of ATSB recommendations R20070005 and R20070008. The implication of the second paragraph above is that the TAWS/GPWS warnings are due to incorrect operation of the aircraft in that they are 'incorrectly configured'. It is the ATSBs understanding that for many aircraft (particularly those in the general aviation sector), that it is not normal for the aircraft to be configured with full landing flap at the final approach fix and that the flap may not be fully deployed until the aircraft becomes visual. The ATSB also makes the following comments in relation to the recommendations contained in the report attached to your letter. Recommendation 1: As noted in Air Transport Communication (ATcom) issue 2, dated Friday 18 July 2008, APV approaches are 'some time away' and it is our understanding that unless the APV solution in Australia is compatible with overseas systems (for example, WAAS) the expense and complexity of such systems will result in them being feasible for the higher end of the market. The majority of general aviation will still be dependant upon existing approach designs, primarily RNAV (GNSS). There may be an interim solution by redesigning the approach to the new version of ICAO PANS-OPS that could result in a more closely runway aligned approach, providing lateral clearance from the South Pap Terrain feature. The ATSB supports an assessment of a redesigned RNAV (GNSS) non-precision approach using the new ICAO standards as an interim measure. Recommendation 2: The ATSB agrees with this recommendation, with the reservation regarding the feasibility and availability of the equipment required for APV approaches discussed above. The ATSB remains willing to assist CASA in any way possible to resolve any outstanding issues with our collective aim to improve safety. The ATSB is continuing the Safety Issue investigation into the conduct of Lockhart River runway 12 RNAV (GNSS) approaches
Initial ATSB response: The ATSB acknowledges CASA's actions to recruit safety systems specialists and the importance of professional judgement in performing regulatory oversight. However, the ATSB still believes that guidance material provided to CASA inspectors was and is inadequate. | Further ATSB response June 2007: The ATSB defines a safety issue as a safety factor that (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operational environment at a specific point in time. As such, the classification of the safety issue as a contributing safety factor is irrelevant in terms of safety action.The ATSB notes CASA's intention to employ a further nine Safety System Specialists by the end of 2007 and that these specialists will write guidance and procedures for CASA staff whose responsibilities include evaluating management systems, to ensure effectiveness and consistency. Accordingly, the ATSB has amended the status of this recommendation to ' Monitor'.

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2005-001	Significant	4/04/2007	12/03/2009	708	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	11/03/2009	707	Proactive safety action	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	11/12/2009	982	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	19/02/2009	687	Safety Recommendation	Civil Aviation Safety Authority

Safety Finding
CASA risk assessments for changes in operations
Reg requirements - safety management systems
CASA processes assessing operator's risk profile
CASA processes evaluating instrument approaches

Safety Issue
R20070003 CASA did not require operators to conduct structured and/or comprehensive risk assessments, or conduct such assessments itself, when evaluating applications for the initial issue or subsequent variation of an Air Operator's Certificate. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
Although CASA released a discussion paper in 2000, and further development and publicity had occurred since then, there was no regulatory requirement for RPT operators to have a safety management system.
R20070004 CASA did not have a systematic process for determining the relative risk levels of airline operators. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
R20070005 CASA's process for accepting an instrument approach did not involve a systematic risk assessment of pilot workload and other potential hazards, including activation of a ground proximity warning system. The ATSB recommends that the Civil Aviation

Organisation Response

Risk assessment concepts continue to be developed in CASA. Risk assessment training has been provided to staff with the emphasis now changing to incorporate safety management principles. The AS/NZS4360: 2004 standard on risk assessment is referenced in the Surveillance Procedures Manual. Additionally, work has commenced on a new CASA Surveillance IT system to be incorporated into Aviation Industry Regulatory System. This system will include a risk module. Such a system should significantly improve CASA's governance, risk identification and reporting capability leading to more effective surveillance of the industry. | Further CASA response 1 June 2007: CASA acknowledges this recommendation but does not support its categorisation as a contributing safety factor at paragraph 3.2.4. There is no legislative requirement that operators conduct, or that CASA require such operators to conduct or itself to conduct, structured and/or comprehensive risk assessments, when operator's make an application for the initial issue or subsequent variation of an Air Operator's Certificate. However, as acknowledged by the ATSB, CASA has encouraged operators to adopt Safety Management System (SMS) over the past 10 years and many have done so. CASA is drafting an amendment m Civil Aviation Order (CAO) 82.0 to mandate SMS to ensure that all passenger carrying operators establish and use a system for managing safety. It is anticipated that this amendment will be made before the end of 2007. A SMS, by its nature, will include a structured risk assessment methodology for evaluating change, including change of the scope of operations. The ATBS Report acknowledges that CASA intends to mandate Crew Resource Management training for passenger carrying operators. The proposed amendment to CAO 82.0 will also require Air Operator Certificate holders to provide this type of training for their crews. CASA has also employed six Field Safety Advisors who provide safety advice to members of the aviation community. This is particularly important to industry members living in regional areas who do not have the opportunity m receive safety information from other sources. The programs of safety education being provided, including SMyS advice and education are a continuation of those provided by CASA for more than a decade. CASA is producing a booklet for operators about Change Management which will be published for distribution in July 2007. CASA is developing a Safety Management "toolkit" for smaller operators. This will be introduced by September 2007 in the form of the successful, "Briefing in a Box" concept. This Toolkit will identify means by which an operator can better understand and evaluate issues such as equipment, routes, key personnel, classification of operations and organisational structures in a changing environment. In addition, CASA is developing a product that addresses non technical skills for flight crew such as situational awareness, fatigue, threat and error management and workload issues. The requirement for operators to have a structured risk assessment methodology will be included in the proposed Civil Aviation Safety Regulation (CASR) Part 119 (Air Operator Certification - Air Transport). This Part is planned to be made in 2008. CASA will publish an acceptable means of compliance and an Advisory Circular (AC)on the subject. This will provide guidance material for industry to assist in complying with particular legislative requirements. | Further CASA response 8 October 2008: CASA has now expanded the Aviation Safety Advisors program in 2008 to a total of eleven advisors who provide safety advice to members of the aviation community. This is particularly important to industry members living in regional areas who do not have the opportunity to receive safety information from other sources. The programs of safety education being provided, including Safety Management advice and education are a continuation of those provided by CASA for more than a decade. CASA has developed a Safety Management Toolkit for operators. The final production is underway and distribution started in March/April 2008 with the initial components being the Message to CEOs, a Best Practice SMS booklet and DVD, the previously existing SMS DVD and the Change Management Booklet. Other safety management issues will be included in due course. The CEO Booklet aims at providing CEOs with a strategic direction with respect to Safety Management. The Best Practice material provides current industry safety management norms as told by the industry. The distribution of the Change Management booklet has been held pending the completion of the Safety Management Toolkit of which it now forms a part. This booklet identifies means by which an operator can better understand and evaluate issues such as equipment, routes, key personnel, classification of operations and organisational structures in a changing environment. CASA has engaged a consultant and is currently developing a "Briefing in a Box" product that addresses non technical skills for flight crew such as situational awareness, fatigue, threat and error management and workload issues. This product will provide operators with the tools to conduct their own training and education for staff and crew. The Industry Oversight Project provides all CASA oversight with a clear risk based framework, which assesses safety risk within Permission Holders, the risks associated with managing safety oversight of a wide variety of permissions and the risks associated with oversight strategy, which includes hazards identified across the industry, as well as responding to government guidance. The Framework provides the various levels of surveillance activity and management within the organisation with clear guidance on assessment of risk and the treatments/controls available for their use. Entry Control in particular is provided with clear guidance on assessment of safety risk. This is tied closely to the

International Civil Aviation Organization requirements On 17 July 2006, ICAO amended Annex 6 to include requirements for safety management systems. The Annex stated that, as of 23 November 2006: States should require, as part of their safety programme, that an operator implements a safety management system acceptable to the State of the Operator that, as a minimum: a) identifies safety hazards; b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented; c) provides for continuous monitoring and regular assessment of the safety level achieved; and d) aims to make continuous improvements to the overall level of safety. The Annex also stated that, from 1 January 2009, the recommendation would become a standard. On 23 March 2007, CASA provided the following response: CASA recommends that operators have safety management systems in place at the entry control point. At present, the only head of power for CASA to ensure an operator conducts its operations with a reasonable degree of care and diligence is a general provision in section 28BE of the Civil Aviation Act 1988, which provides, relevantly: (1) The holder of an AOC must at all times take all reasonable steps to ensure that every activity covered by the AOC, and everything done in connection with such an activity, is done with a reasonable degree of care and diligence. (2) If the holder is a body having legal personality, each of its directors must also take the steps specified in subsection (1). Regulation changes are planned to more specifically require Safety Management Systems. CASA has led the field globally, with the Safety Management Systems concept in 2000. Since then, CASA has contributed significantly to ICAO developments which led to the amendment of Annex 6 in November 2006, which deals specifically with this subject. Despite the regulatory requirement not yet being introduced, operators have been strongly encouraged, through a variety of methods including publication of educational material, to adopt Safety Management Systems. Safety Management Systems were also discussed at a major industry conference, called Flight Crew Licensing, Operations and Training (FLOT), sponsored by CASA for the aviation industry in March 2003. The FLOT conference was attended by 300 industry representatives and 729 people viewed the presentation on-line. The CASA Corporate Plan 2006-07 to 2008-09 demonstrates CASA’s developmental work in this area with a specific initiative to introduce Safety System Specialists and Air Transport Inspectors. In June 2006, CASA’s operational workforce capability was enhanced with the recruitment of three Safety System Specialists. These staff have been employed, not because they are technical specialists (pilots or engineers), but rather because they have specific knowledge and experience in the assessment of safety systems and their associated issues. In addition, a number of Air Transport Inspectors with system safety backgrounds are currently being recruited (March and April 2007).

CASA has recently restructured to more accurately align resources with functions required by the Civil Aviation Act. As an element of that restructure a dedicated Safety Analysis and Education division has been formed. Also, the former Air Transport, Manufacturing and General Aviation groups have been merged to form the new CASA Operations Division. A Safety Oversight Branch has been established within that division. Within the Safety Oversight Branch dedicated Safety Performance Management and National Safety Planning sections have been established. The previous work conducted by the Industry Oversight Project is now being managed to fruition through the current establishment of these areas and an operational enhancement program dedicated largely to the creation of a risk based oversight methodology. This work is premised upon contemporary risk management philosophies and will deliver a systemic process for the management of safety performance at a national level. It will generate processes for more effectively capturing, assessing and managing the relative risk levels of Australian civil aviation permission holders through the strategic application of CASA resources in line with those aviation safety risk levels. | Further CASA response 1 June 2007: CASA has a project underway to review, and if necessary, redesign elements of the oversight regime. The implementation phase of the project commences in early 2008. This project also includes a risk assessment module. It is intended that the entire surveillance system be based upon an integrated risk framework. | Further CASA response 8 October 2008: There is significant progress of the Industry Oversight Project in developing the systematic assessment of relative risks of airline operators. A large group of smaller operators were assessed for relative safety risk when they became part of the oversight responsibility of CASA's Air Transport Operations Group. This assessment was achieved using a method initially developed between the Group and the Project and this method is currently being further developed to be applied across all Air Operators under the Group's oversight. This enables the Group to target its resources effectively and identify clearly operators who may not be managing safety appropriately based on risk. The same method is to be further developed, adapted and applied for all CASA oversight activity. | Further CASA response 7 December 2009: CASA has recently restructured to more accurately align resources with functions required by the Civil Aviation Act. As an element of that restructure a dedicated Safety Analysis and Education division has been formed. Also, the former Air Transport, Manufacturing and General Aviation groups have been merged to form the new CASA Operations Division. A Safety Oversight Branch has been established within that division. Within the Safety Oversight Branch dedicated Safety Performance Management and National Safety Planning sections have been established. The previous work conducted by the Industry Oversight Project is now being managed to fruition through the current establishment of these areas and an operational enhancement program dedicated largely to the creation of a risk based oversight methodology. This work is premised upon contemporary risk management philosophies and will deliver a systemic process for the management of safety performance at a national level. It will generate processes for more effectively capturing, assessing and managing the relative risk levels of Australian civil aviation permission holders through the strategic application of CASA resources in line with those aviation safety

In response to the ATSB Safety Issue investigation AI-2007-010, CASA advised the ATSB that CASA would support Airservices in the design and approval of the Lockhart River Runway 12 RNAV (GNSS) non-precision approach to the latest revision of ICAO PANS-OPS. |

ATSB Response
Initial ATSB response: The ATSB acknowledges CASA's on-going development of risk assessment concepts. However, the safety issue also relates to the lack of a regulatory requirement for operators to conduct and provide a risk assessment of initial issue or subsequent renewal of an AOC, as well as CASA's ability to evaluate such risk assessments. | Additional ATSB response June 2007: The ATSB defines a safety issue as a safety factor that (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operational environment at a specific point in time. As such, the classification of the safety issue as a contributing safety factor is irrelevant in terms of safety action. While the ATSB acknowledges the lack of any specific regulatory requirements relating to risk assessment, it would appear that Section 28(1) and (2) of the Civil Aviation Act 1988 implies a process of risk assessment. Regardless, the ATSB notes the actions being taken by CASA to address the safety issue and has amended the status of this recommendation to 'Monitor'. | Additional ATSB response October 2008: The ATSB acknowledges CASAs commitment to providing educational material to industry to assist operators manage changes to operations from a safety management system perspective, as well as CASAs commitment to use a risk-based approach for the over-sight of industry. The ATSB also recognises the Civil Aviation Orders 82.3 and 82.5, as amended 3 February 2009, which require regular public transport operators to have a safety management system in place that, 'as a minimum, include ..... (b) a safety risk management plan, including documented details of the following: (i) hazard identification processes; (ii) risk assessment and mitigation processes'.
The ATSB acknowledges CASA's international role in this area and notes that CASA is working towards implementing the Civil Aviation Safety Regulation Part 119 and is implementing measures in the interim to encourage operators to establish safety management systems. The ATSB acknowledges CASA's intention to address this safety issue. As a result of this advice of proposed safety action by CASA, the ATSB will continue to monitor its progress until evidence is received of the implementation of the proposed safety action.
Initial ATSB response: The ATSB notes the actions being taken by CASA to address this safety issue and has amended the status of this recommendation to 'Monitor'. | Further ATSB response October 2008: The ATSB acknowledges that CASA is undertaking positive action to address this safety issue. Before the ATSB closes this safety recommendation it would like to be advised about the success and outcomes of the actions described by CASA.
The ATSB acknowledges that although CASA may consider pilot workload and potential hazards during instrument approach revalidation, it does not intend to include such assessments in the original validation process. In addition, hazards currently assessed in the

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
AO-2005-001	Significant	4/04/2007	11/03/2009	707	Proactive safety action	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	Not yet addressed	Not yet addressed	Proactive safety action	Civil Aviation Safety Authority
AO-2005-001	Minor	4/04/2007	11/12/2009	982	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	19/10/2012	2025	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	29/11/2010	1335	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	10/02/2010	1043	Safety Recommendation	Civil Aviation Safety Authority
AO-2005-001	Significant	4/04/2007	3/04/2009	730	Safety Recommendation	Airservices Australia

Table 6

Safety actions taken by CASA and Airservices Australia to address recommendations issued by the ATSB
January 2001 to October 2007

** NB: This table includes safety actions taken in response to safety issues (previously called safety deficiencies) identified in ATSB investigations, which resulted in the issuing of a recommendation or Safety Advisory Notice (SAN). Details of proactive safety actions w*

In this table, one row represents a safety action taken by an action organisation to respond to a safety issue. For some recommendations, multiple actions were required for the ATSB to be satisified that a safety issue was addressed.

Safety Issue	Type of Response	Safety Issue Release Date	Date Response Received	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation

Safety Finding
Reg requirements - crew resource management
Reg requirements - crew coordination training
Reg requirements - terrain on approach charts
Reg guidance - operations manual content
Aircraft / avionics maintenance
Aircraft / avionics maintenance
RNAV (GNSS) approach waypoint naming conventions

vere not recorded electronically during this period.

Safety Finding

Safety Issue
Although CASA released a discussion paper in 2000, and further development had occurred since then, there was no regulatory requirement for initial or recurrent crew resource management training for RPT operators.
There was no regulatory requirement for flight crew undergoing a type rating on a multi-crew aircraft to be trained in procedures for crew incapacitation and crew coordination, including allocation of pilot tasks, crew cooperation and use of checklists. This was required by ICAO Annex 1 to which Australia had notified a difference.
R20070007 There was no regulatory requirement for instrument approach charts to include coloured contours to depict terrain. This was required by a standard in ICAO Annex 4 in certain situations. Australia had not notified a difference to the standard. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
R20070006 CASA's guidance material provided to operators about the structure and content of an operations manual was not as comprehensive as that provided by ICAO in areas such as multi-crew procedures and stabilised approach criteria. The ATSB recommends
R20060005 The CVR system was unserviceable and the FDR system was partially unserviceable. The resulting lack of information hindered the investigation. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue. Recommendation 20060005: The ATSB recommends that CASA review the maintenance requirements for CVR systems and FDR systems against international standards such as EUROCAE ED-112 and ICAO Annex 6 with the aim of improving their reliability and increasing the availability of data to investigators.
R20060006 The CVR system was unserviceable and the FDR system was partially unserviceable. Existing legislation hinders the performance of effective maintenance action on CVR systems. Recommendation R20060006: The ATSB recommends that DOTARS, with the
R20060022 The Australian convention for waypoint names in RNAV (GNSS) approaches did not maximise the ability to discriminate between waypoint names on the aircraft global positioning system display and/or on the approach chart. The ATSB recommends that Airservices Australia should address this safety issue.

Safety Issue

Organisation Response

Response from Civil Aviation Safety Authority Date received: 23 March 2007 Regulations mandating Crew Resource Management (CRM) for RPT operators are in development. However, operators have all been strongly encouraged to adopt CRM training through a variety of methods and industry consultation. CASA has current projects to enhance guidance material on standard operating procedures, Human Factors (HF) / CRM and crew cooperation in multi-crew operations. CASA has used material (HF and CRM) from the draft Civil Aviation Safety Regulation Part 121 in order to develop appropriate advisory material (see http://rrp.casa.gov.au/casrcreate/121.asp for more information on Part 121).
Date received: 23 March 2007 Regulations are currently being developed to mandate these requirements and when enacted will result in a withdrawal of the notified difference.
Under the Airspace Act, which received royal assent on 30 March 2007, when regulations are made under that Act, oversight responsibility for the Aeronautical Information Service (AIS) will be assumed by CASA. Airservices Australia is currently the Australian AIS provider. Airservices Australia publishes the Aeronautical information Publications which includes instrument approach charts. When CASA has full oversight responsibility for the AIS, it will be developing oversight standards including chart and data base quality and integrity standards. These will be included in a proposed CASR Part 175 (Aeronautical Information Services). | Further response by CASA 7 December 2009: The Part 175 Notice of Proposed Rule Making has been issued for public comment. Airservices have made coloured IAP charts available on line for those locations where it is specified by ICAO. The terrain in Australia does not justify the expense of producing hard copy coloured plates for limited locations however they will be readily available for down loading effective
CASA advised that work is progressing on CAAP 215 but that the schedule is undefined as it is subject to regulatory changes. | Further CASA response 23 March 2007: Guidance material in the form of an advisory circular on multi-crew operations, which includes such
Initial CASA reponse (22 May 2006): The maintenance and testing requirements for flight data recorders (FDR) and cockpit voice recorders (CVR) are not explicitly defined in Australian regulations. ICAO Annex 6 requirements are accepted as the minimum requirement to be met by operators when submitting Schedules of Maintenance for CASA approval. ICAO Annex 6, Part 1, Attachment D, Flight Recorders, provides guidance for pre-flight checking, inspection and calibration of flight data recording and cockpit voice recording systems. CASA guidance in relation to flight data recorder maintenance is set out in CAAP 42L-4(0), and includes reference to ICAO Annex 6 and EUROCAE ED-112. In light of this recommendation, CASA will review the maintenance requirements for flight data recorders and cockpit voice recorders against the relevant international standards, and will consider in particular whether minimum requirements for such maintenance should be prescribed. In the interim, CASA will review the existing guidance material with a view to providing more specific maintenance interval guidelines. CASA will be providing additional training in the maintenance of FDR/CVR systems for airworthiness personnel. This will enhance their knowledge in these systems and will assist them when evaluating aircraft systems of maintenance. However, as an initial comment, CASA considers that there is no substantive need for a maintenance check of the CVR to be conducted by actually listening to the tape. It is likely that a functional system check can confirm the fidelity of the equipment rather than actually needing to listen to the tapes, as this has the potential to destroy the efficacy of the CVR recording process. | Further CASA response 16 August 2006: This response restated the CASA response of 22 May 2006 | Further CASA response 7 December 2009: At the time these amendments to the Civil Aviation Act and Civil Aviation Regulations (1988) were developed (ATSB insertion: to allow for listening to CVR audio for maintenance purposes - see R20060006) the existing standards for the maintenance of CVR's were also reviewed. Based on this review in combination with the Act and Regulation amendments CASA believes there are appropriate standards in place for the maintenance of CVR's.
Initial CASA response 16 August 2006: CASA notes that this recommendation is primarily directed to DOTARS, which is responsible for administration of Part 111B of the Civil Aviation Act 1988. In accordance with the recommendation, CASA will cooperate with the
Waypoint naming has some guidance in internationally agreed criteria and is constrained by what the flight management computer can handle. PANS-OPS Vol II, Chapter 31, paragraph 31.1.2 states that: 'Each fix shall be published as a waypoint.....with an alphanumeric identifier.' The database constraint and requirement for the waypoint to have a unique identifier has posed certain problems. •There are not enough unique ICAO 5-letter pronounceable identifiers to cover the number of new waypoints generated by RNAV procedures. •To avoid confusion in the database, each waypoint needs a unique name (certain database coders talk of proliferation of one waypoint name e.g. Final fix Runway 36 - FFR36). To counter this, various five character alphanumeric protocols have been developed globally, but essentially they all have the same function. They provide the following: •Uniqueness •Attributes to a particular aerodrome •Hierarchy •General guidance to the pilot to aid situational awareness. The Australian naming convention for waypoints used on Airservices Australia GNSS charts was devised by CASA and was endorsed by the industry GPS Implementation Team in the mid 1990s. This waypoint naming convention is specified in the Manual of Standards Part 173 paragraph 8.9.3 Drafting Conventions. The naming convention is designed on the following principles: •RNAV (GNSS) waypoints shall be named using a unique five letter code. •The first three letters will be the last three letters of the airport Y code identifier (e.g.; SCB for YSCB). •The fourth will be the direction from which the procedure approaches the airport (e.g.; N, S, E, or W). •The fifth will identify the procedure fix type (I for the IF, F for the FAF, M for the MAPt, T for the MATF and H for the MAHF). NB: MATF - Missed approach turning fix. MAHF - Missed approach holding fix. •For IAFs the letter will commence with A and will progress alphabetically, excepting 'O', to each IAF, noting that the identifiers for the succeeding fixes (IF, FAF, etc) shall not be used. Any review of a naming convention must have global application as pilots from outside Australia must be able to grasp the principles of what is being applied. Internationally there is still debate over the naming convention, but there is a consistent logic behind the Australian RNAV waypoint naming. In light of the above, Airservices Australia, in conjunction with CASA, will consult the ICAO Obstacle Clearance Panel and Operations Panel to ascertain the international perspective with regard to waypoint naming to prior to reviewing the Australian naming convention. | Further response by Airservices 21 December 2007: With regard to R20060022, Airservices staff met with CASA in early September [2007] to discuss this matter. CASA representatives expressed the view that the Australian naming convention was logical and consistent with ICAO requirements. CASA representatives advised that action on this matter is on hold pending budget constraints. In the mean time CASA staff are attending international panels (ICAO OCP [International Civil Aviation Organization Obstacle Clearance Panel]) and taking on international advice as a preliminary step to any further action. In addressing changes to naming conventions we will be taking into account the human factors aspects, with a focus on the pilot / cockpit environment. Changes will be developed in the context of being long term fixes, and will be implemented with an appropriate transition strategy. Airservices strongly supports the commissioning of a joint working group with CASA to promote a broader understanding of the topic, as the issues surrounding waypoint naming

Organisation Response

ATSB Response
The ATSB notes that CASA is working towards implementing the Civil Aviation Safety Regulation Part 121 and is implementing measures in the interim to encourage and help operators to establish crew resource management training. The ATSB acknowledges CASA's intention to address this safety issue. As a result of this advice of proposed safety action by CASA, the ATSB will continue to monitor its progress until evidence is received of the implementation of the proposed safety action.
The ATSB acknowledges CASA's intention to address this safety issue. As a result of this advice of proposed safety action by CASA, the ATSB will continue to monitor its progress until evidence is received of the implementation of the proposed safety action.
The ATSB notes the actions being taken by CASA to address this safety issue and has amended the status of this recommendation to 'Monitor'. | Further response by the ATSB December 2009: The ATSB is satisified that the actions taken by CASA have adequately addressed this safety issue.
While the ATSB acknowledges CASA's intention to issue an advisory circular on multi-crew operations, the safety issue relates more broadly to the structure and content of operations manuals. | Further ATSB response June 2007: The ATSB notes the action being taken
The ATSB notes that CASA have reviewed the existing standards for CVR maintenance, in light of the amendments to the Civil Aviation Act and Regulations (facilitating access to CVR recordings for maintenance purposes). While the ATSB acknowledges that this (and previous) action meets the explicit requirements of the recommendation, the outcome of the review, however, (that there are appropriate standards in place for the maintenance of CVRs) does not serve to address the intent of the recommendation, which was to effect an improvement in the reliability of these systems. The ATSB will continue to monitor and pursue the issue of flight recorder maintenance standards, given the importance of the role that this equipment plays in the safety investigation process, and the risk to the effectiveness of future investigations presented by unserviceable CVR and flight recording systems.
The ATSB is satisfied that the action taken by the Department of Infrastructure and Transport and by CASA adequately addresses the safety issue.
The ATSB is satisfied that the action taken by Airservices Australia and CASA adequately addresses the safety issue.

ATSB Response

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20000111	Initial Response	1/03/2001	20/04/2001	-	Recommendation	Civil Aviation Safety Authority
R20000111	Further correspondence	1/03/2001	6/10/2002	584	Recommendation	Civil Aviation Safety Authority
R20000130	Initial Response	30/03/2001	4/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000130	Further correspondence	30/03/2001	16/08/2006	1965	Recommendation	Civil Aviation Safety Authority
R20000131	Initial Response	30/03/2001	4/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000131	Further correspondence	30/03/2001	16/08/2006	1965	Recommendation	Civil Aviation Safety Authority
R20000132	Initial Response	30/03/2001	4/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000132	Further correspondence	30/03/2001	16/08/2006	1965	Recommendation	Civil Aviation Safety Authority
R20000133	Initial Response	30/03/2001	4/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000133	Further correspondence	30/03/2001	16/08/2006	1965	Recommendation	Civil Aviation Safety Authority
R20000181	Initial Response	24/04/2001	13/12/2000	Action completed during investigation	Recommendation	Civil Aviation Safety Authority
R20000182	Initial Response	24/04/2001	13/12/2001	233	Recommendation	Civil Aviation Safety Authority
R20000183	Initial Response	24/04/2001	13/12/2000	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
Pratt and Whitney PW100 Series Reduction Gear Box Input Shafts
Pratt and Whitney PW100 Series Reduction Gear Box Input Shafts
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Fuel Contamination - Index
ACAS Considerations for 10 - 30 seat aircraft
ACAS Considerations for 10 - 30 seat aircraft
ACAS Considerations for 10 - 30 seat aircraft

Safety Issue
The Australian Transport Safety Bureau recommends that Civil Aviation Safety Authority investigate the need for regular borescope inspections of PW118A reduction gear-box input shafts with below recommended thickness carburised case depth (pre SB 21323), regardless of the Service Bulletin state of the engine.
The Australian Transport Safety Bureau recommends that Civil Aviation Safety Authority investigate the need for regular borescope inspections of PW118A reduction gear-box input shafts with below recommended thickness carburised case depth (pre SB 21323), regardless of the Service Bulletin state of the engine.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority identify and adopt an appropriate specification for each grade of fuel that is approved for use in Australia, or in aircraft on the Australian civil register.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority identify and adopt an appropriate specification for each grade of fuel that is approved for use in Australia, or in aircraft on the Australian civil register.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority identify and adopt an appropriate specification for each grade of fuel that is approved for use in Australia, or in aircraft on the Australian civil register.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, either by itself, or in cooperation with other organisations, develop a process to satisfy itself that fuel that is fit for purpose is consistently supplied to aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, either by itself, or in cooperation with other organisations, develop a process to satisfy itself that fuel that is fit for purpose is consistently supplied to aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority develop appropriate lines of communication to ensure that it is made aware in a timely manner of information relating to the management of situations related to fuel quality that could affect the safety of flight.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority develop appropriate lines of communication to ensure that it is made aware in a timely manner of information relating to the management of situations related to fuel quality that could affect the safety of flight.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that prior to any significant devolution or change in regulatory process, appropriate measures are taken to ensure that aviation safety is not diminished.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that prior to any significant devolution or change in regulatory process, appropriate measures are taken to ensure that aviation safety is not diminished.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority mandate the fitment and use of an Airborne Collision Avoidance System in all aircraft with a passenger seating capacity of 10 - 30 seats engaged in Regular Public Transport operations and set a timetable for the introduction of such equipment.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider the requirement for the fitment and use of a suitable Airborne Collision Avoidance Systemin aircraft engaged in the carriage of pasengers for hire or reward in other than Regular Public Transport operations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority expand the requirements for the carriage and activation of transponders with the object of maximising the effectiveness of airborne collision avoidance systems.

Organisation Response
ATSB Note: On 3 March 2001, the CASA, in its reply to the draft investigation report, made the following statement in regard to the draft recommendation: `Unfortunately, it would not be possible to determine the case depth without considerable work. The recommendation is therefore difficult to implement. `At this time, we intend to respond to the problem identified by providing information on the problem to each operator of the 4edngine. This would be reevaluated if the manufacturer provides you with information which would justify mandatory action.' The following response was received on 17 April 2001: `ATSB Recommendation 20000111 recommends the Civil Aviation Safety Authority investigate the need for regular borescope inspections of PW118A reduction gearbox (RGB) input shaft with below recommended thickness carburised case depth (pre SB 21323) regardless of the service bulletin status of the engine. `PW118A engine, S/No PC-E 115093 experienced a failure of the 1st stage reduction input gearshaft. Failure of the gearshaft was attributed to spalling and subsequent fatigue fracture of the gearshaft teeth. While damage to the engine was extensive, the failure was contained. The aircraft is certificated to operate safely with one engine failed. `The engine was returned to Pratt and Whitney Canada (PWC) for investigation. That investigation found the case hardening at the root of the input gearshaft teeth was below minimum requirements both in depth and hardness. `The RGB chip detector was also found to be defective. Although it passed the continuity test, the poles of the detector had fractured. The investigation did not identify if the chip detector damage was secondary. PWC strongly believes a serviceable chip detector would have identified gear tooth spalling during routine chip detector inspection and well before the failure event. `Spalling of gear teeth in the reduction gear is a known problem in certain models of the PW100 engines. Initially such spalling was controlled by routine borescope inspection of the gear teeth. Modification to the oil supply to the gear teeth (SB 20246 for the PW118A engine model) has been effective in reducing the incidents of gear tooth spalling. As such, the requirement for regular borescope inspection was deleted by PWC for engines modified by SB 20246. The RGB magnetic chip detector system has been reliable in identifying subsequent gearshaft spalling events. `An improved input gearshaft featuring greater case depth and a larger gear tooth root radius is also available to overcome the problem (SB 21323 for the PW118A engine model). The engine involved in the incident had a pre-SB 21323 input shaft installed and was modified to incorporate SB 20246. As such borescope inspection was not required for this reduction gearbox configuration. `The primary cause of the failure was that the case hardening at the root of the gear teeth of the input gearshaft did not meet specification. The ATSB recommendation addresses this by recommending borescope inspection of those shafts that are known to have inadequate case hardening. While NDT techniques to measure case hardening depth are available, the gearshaft would need to be removed from the engine for such an inspection. It would be impractical to identify affected gearshafts for in-service engines. Thus, to address the ATSB recommendation, it would be necessary to include all pre-SB21323 gearshafts in the population to be borescoped. `The ATSB recommendation should also be applied to other affected models of the PW100. While the exact number of affected shafts in the Australian fleet is not known, advice from the manufacturer suggests that few engines remain to be modified. Australian PW100 operators are aware of the severity of this engine failure and the circumstances surrounding the event. `PWC advises that events of this nature are extremely rare, 1 incident in 20 million engine operating hours. It is therefore understandable that the manufacturer deleted borescope inspection requirements if the modified oil supply system is incorporated. Indeed, the way the engine manual calls up the borescope requirement, it appears that the shaft may have failed before the first inspection was due. `Given that such events are rare, that the ATSB recommendation would impose a significant maintenance burden on operators without any confidence of preventing future problems, and that the RGB chip detector should provide adequate warning of such events, CASA does not consider mandatory action to address the ATSB recommendation is justified. However, CASA will advise each operator of these engines about
Thank you for your letter of 28 August 2002 concerning Recommendation R20000111. This Recommendation arises from the incident involving a Brasilia aircraft VH-ASN which occurred 87km north west of Tindal Aerodrome, Northern Territory on 1 June 1999 - ATSB Occurrence Brief 199902600. The Bureau seeks advice on the action CASA has taken to inform operators of the incident and to recommend to them the expedited incorporation of the modified reduction gearbox input shaft for the Pratt & Whitney engine. On 10-11 December 2001, a CASA officer attended the Embraer Operators Conference which was held in Brisbane. All Australian operators of the Embraer 120 aircraft and a number of potential operators attended the conference. The issue was raised at that conference, including the advantages of incorporating Pratt & Whitney's SB 21323 to install an improved input shaft. CASA believes that the undertaking to advise each operator of the engine type has been fulfilled by this action. CASA also notes that there has been a considerable elapse of time since the incident without any indication of further problems. Therefore CASA regards the issue is concluded. However, should either Transport Canada or the manufacturer of the engine provide a response to ATSB Recommendations R20000109 and R20000110, respectively, which indicates a need for more formal action, that would be considered by CASA.
I refer to the Australian Transport Safety Bureau's report and recommendations arising from the Systemic Investigation into Fuel Contamination. As agreed with the Department of Transport and Regional Services and discussed with [name supplied] today, CASA will not be in a position to respond to the content and recommendations of the report until such time as a portfolio response to the Senate Rural and Regional Affairs and Transport report into matters relating to aviation fuel has been finalised.
CASA has no input to the recommendation from 2000, and requests that it be marked as "closed".
I refer to the Australian Transport Safety Bureau's report and recommendations arising from the Systemic Investigation into Fuel Contamination. As agreed with the Department of Transport and Regional Services and discussed with [name supplied] today, CASA will not be in a position to respond to the content and recommendations of the report until such time as a portfolio response to the Senate Rural and Regional Affairs and Transport report into matters relating to aviation fuel has been finalised.
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CASA has no input to the recommendation from 2000, and requests that it be marked as "closed".
I refer to the draft ASO Report on the traffic confliction incident involving Beech 1900, VH-IMA, Beech 1900, VH-IMH, Piper PA-31 (Chieftain) VH-SVV, and De Havilland DHC-8-201 (Dash 8), VH-TQO, which occurred near Port Macquarie, NSW on 28 April 1999. The Civil Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. I am concerned that in making the recommendations contained in R20000181 and R20000182, the ATSB has not recognised either the limitations of ACAS equipment or the fact that such recommendations cannot be justified on a cost-benefit basis. A detailed report on this aspect of the incident is attached, which has been prepared by the CASA officer who is the current Australian member of the ICAO Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel. CASA is, at this stage, still considering R20000183 and is currently reviewing mandatory requirements for the carriage and activation of transponders. Although the current level of transponder fitment in the Australian fleet is high, it is accepted that a higher level of fitment and mandatory requirements for activation of transponders where TCAS-equipped aircraft are operating would enhance safety. With regard to recommendation R20000184, recent articles in Flight Safety Australia have highlighted both the use of transponders generally and the specific transponder requirements for the effectiveness of TCAS. CASA will continue to encourage all levels of industry to a greater level of understanding of the importance of transponder activation. With regard to recommendation R20000198, CASA currently audits air transport operations to ensure that safety management systems are established and maintained, and the new regulations (CASR Part 119) being developed will introduce more stringent requirements to ensure that such matters are addressed in the standard operating procedures of all air transport companies. With regard to recommendation R20000199, CASA is currently reviewing all pilot licensing requirements within the context of the new CASR Part 61. Competency based standards are being progressively introduced to ensure that all pilots have an
I refer to the draft ASO Report on the traffic confliction incident involving Beech 1900, VH-IMA, Beech 1900, VH-IMH, Piper PA-31 (Chieftain) VH-SVV, and De Havilland DHC-8-201 (Dash 8), VH-TQO, which occurred near Port Macquarie, NSW on 28 April 1999. The Civil Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. I am concerned that in making the recommendations contained in R20000181 and R20000182, the ATSB has not recognised either the limitations of ACAS equipment or the fact that such recommendations cannot be justified on a cost-benefit basis. A detailed report on this aspect of the incident is attached, which has been prepared by the CASA officer who is the current Australian member of the ICAO Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel.
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ATSB Response
Monitor
Closed-Accepted
Open
Closed-Not Accepted
Open
Closed-Not Accepted
Open
Closed-Not Accepted
Open
Closed-Not Accepted
Closed-Not Accepted
Closed-Accepted
Monitor

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20000183	Further correspondence	24/04/2001	20/03/2008	2522	Recommendation	Civil Aviation Safety Authority
R20000184	Initial Response	24/04/2001	13/12/2000	Action completed during investigation	Recommendation	Civil Aviation Safety Authority
R20000186	Initial Response	30/03/2001	4/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000186	Further correspondence	30/03/2001	16/08/2006	1965	Recommendation	Civil Aviation Safety Authority
R20000190	Initial Response	1/06/2001	20/03/2002	292	Recommendation	Civil Aviation Safety Authority
R20000198	Initial Response	24/04/2001	13/12/2000	Action completed during investigation	Recommendation	Civil Aviation Safety Authority
R20000199	Initial Response	24/04/2001	13/12/2000	Action completed during investigation	Recommendation	Civil Aviation Safety Authority
R20000234	Initial Response	18/04/2001	20/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20000234	Further correspondence	18/04/2001	26/03/2008	2534	Recommendation	Civil Aviation Safety Authority
R20000235	Initial Response	18/04/2001	20/03/2002	336	Recommendation	Civil Aviation Safety Authority
R20000238	Initial Response	18/04/2001	20/03/2002	336	Recommendation	Civil Aviation Safety Authority
R20000239	Initial Response	18/04/2001	20/03/2002	336	Recommendation	Civil Aviation Safety Authority

Safety Finding
ACAS Considerations for 10 - 30 seat aircraft
ACAS Considerations for 10 - 30 seat aircraft
Fuel Contamination - Index
Fuel Contamination - Index
Bell 206 loss of hydraulics and main rotor RPM indication.
Situational awareness by pilots OCTA
Situational awareness by pilots OCTA
Emergency procedures and emergency procedures training for cabin crew
Emergency procedures and emergency procedures training for cabin crew
Flight and duty times
CASA systems audit policies and procedures
CASA regulation of HCRPT operations on wet/contaminated runways pending promulgation of CASR Part 121A

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority expand the requirements for the carriage and activation of transponders with the object of maximising the effectiveness of airborne collision avoidance systems.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the current level of education among all levels of the industry with a view to maximising transponder activation in all airspace.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise Australian operators of Bell 206B III series helicopters of the finding of this accident and revise the calender requirement for the lubrication of the hydraulic pump
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that any company registered for fare-paying passenger operations has standard operating procedures that are adequate for self-separation assurance.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review its educational program for all levels of pilot licences to improve pilot understanding of separation assurance techniques.
The ATSB recommends that CASA should consider including the following issues as requirements of operators during its current development of new legislation in the area of emergency procedures training: - How flight crew should gather and evaluate relevant information and make a decision regarding which type of emergency response is most suitable. - How cabin crew should communicate with each other and the flight deck in emergency situations (in terms of technique, terminology, and methods to ensure that accurate information reaches the flight deck). - How cabin crew should communicate during an emergency on the ground when there is a loss of PA and interphone communications. - How cabin crew should systematically and regularly identify problematic situations in an aircraft during an emergency (including guidelines on what types of information are most important and ensuring that all areas of the aircraft are examined). - Leadership and coordination functions of cabin crew supervisors during an emergency situation. For example, how the supervisors should assess the situation (particularly in circumstances that had not been clearly defined), assign roles and responsibilities amongst the cabin crew, coordinate the gathering of information, and coordinate the distribution of information. - How cabin crew should effectively obtain information from passengers concerning safety-related issues. - How cabin crew should effectively use language and assertiveness for crowd control and managing passenger movement towards exits during emergency situations, as well as passenger control outside the aircraft. - That cabin crew supervisors are provided with appropriate resources to ensure that they can effectively communicate with other areas of the cabin during emergency situations (e.g.
The ATSB recommends that CASA should consider including the following issues as requirements of operators during its current development of new legislation in the area of emergency procedures training: - How flight crew should gather and evaluate relevant information and make a decision regarding which type of emergency response is most suitable. - How cabin crew should communicate with each other and the flight deck in emergency situations (in terms of technique, terminology, and methods to ensure that accurate information reaches the flight deck). - How cabin crew should communicate during an emergency on the ground when there is a loss of PA and interphone communications. - How cabin crew should systematically and regularly identify problematic situations in an aircraft during an emergency (including guidelines on what types of information are most important and ensuring that all areas of the aircraft are examined). - Leadership and coordination functions of cabin crew supervisors during an emergency situation. For example, how the supervisors should assess the situation (particularly in circumstances that had not been clearly defined), assign roles and responsibilities amongst the cabin crew, coordinate the gathering of information, and coordinate the distribution of information. - How cabin crew should effectively obtain information from passengers concerning safety-related issues. - How cabin crew should effectively use language and assertiveness for crowd control and managing passenger movement towards exits during emergency situations, as well as passenger control outside the aircraft. - That cabin crew supervisors are provided with appropriate resources to ensure that they can effectively communicate with other areas of the cabin during emergency situations (e.g.
The ATSB recommends that CASA review the intent of CAO 48 to ensure that operators consider all duties associated with a pilot's employment (including managerial and administrative duties) when designing flight and duty time schedules, and that this requirement is not restricted to situations where there are one or two pilots.
The ATSB recommends that CASA consider widening its existing skill-base within the compliance Branch to ensure that CASA audit teams have expertise in all relevant areas, including human factors and management processes.
The ATSB recommends that CASA ensures that all Australian operators of high capacity jet aircraft have in place procedures and training to ensure flight crews are adequately equipped for operations on wet/contaminated runways.

Organisation Response
Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. CASA is, at this stage, still considering R20000183 and is
I refer to the draft ASO Report on the traffic confliction incident involving Beech 1900, VH-IMA, Beech 1900, VH-IMH, Piper PA-31 (Chieftain) VH-SVV, and De Havilland DHC-8-201 (Dash 8), VH-TQO, which occurred near Port Macquarie, NSW on 28 April 1999. The Civil Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. With regard to recommendation R20000184, recent articles in Flight Safety Australia have highlighted both the use of transponders generally and the specific transponder requirements for the effectiveness of TCAS. CASA will continue to encourage all levels of industry to a greater level of understanding of the
I refer to the Australian Transport Safety Bureau's report and recommendations arising from the Systemic Investigation into Fuel Contamination. As agreed with the Department of Transport and Regional Services and discussed with [name supplied] today, CASA will not be in a position to respond to the content and recommendations of the report until such time as a portfolio response to the Senate Rural and Regional Affairs and Transport report into matters relating to aviation fuel has been finalised.
CASA has no input to the recommendation from 2000, and requests that it be marked as "closed".
A direction under CAR 38(1) of the Civil Aviation Regulations 1988 was forwarded to all Certificate of Registration holders of Bell Helicopter Textron (BHT) JetRanger 206 A and B Series Helicopters on 25 May 2001.
I refer to the draft ASO Report on the traffic confliction incident involving Beech 1900, VH-IMA, Beech 1900, VH-IMH, Piper PA-31 (Chieftain) VH-SVV, and De Havilland DHC-8-201 (Dash 8), VH-TQO, which occurred near Port Macquarie, NSW on 28 April 1999. The Civil Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. With regard to recommendation R20000198, CASA currently audits air transport operations to ensure that safety management systems are established and maintained, and the new regulations (CASR Part 119) being developed will introduce more stringent requirements to ensure that such matters are addressed in the standard operating procedures of all air transport companies.
I refer to the draft ASO Report on the traffic confliction incident involving Beech 1900, VH-IMA, Beech 1900, VH-IMH, Piper PA-31 (Chieftain) VH-SVV, and De Havilland DHC-8-201 (Dash 8), VH-TQO, which occurred near Port Macquarie, NSW on 28 April 1999. The Civil Aviation Safety Authority does not agree with recommendations R20000181 and R20000182, but supports recommendations R20000184, R20000198 and R20000199. R20000183 is still being considered. With regard to recommendation R20000199, CASA is currently reviewing all pilot licensing requirements within the context of the new CASR Part 61. Competency based standards are being progressively introduced to ensure that all pilots have an adequate knowledge of operational subjects, including separation
CASA acknowledges the intent of this recommendation and advises that cabin crew requirements identified in these recommendations are comprehensively addressed in proposed Civil Aviation Safety Regulation Part 121 A -Air Transport Operations -- Large Aeroplanes, which is scheduled for release for interested party consultation in April 2002 as a Notice of Proposed Rule Making. With regard to the recommendation that the authority give consideration to how cabin crew should communicate during an emergency on the ground when there is a loss of PA and interphone communications, CASA advises that CAO 20.11 6A has been amended to require the carriage of portable megaphones on all aircraft engaged in regular public transport activities or charter operations with the seating capacity of more than 60 seats.
ATSB Note: Work on CASR 121 Large aeroplanes is ongoing but based on the previous advice ATSB reclassifies the recommendation as Closed-Accepted (26 March 2008).
CASA acknowledges the intent of this recommendation and advises that the authority has taken significant steps to address the issue of fatigue management in aviation. Through the work undertaken by the authority in consultation with [name], Head of Sleep Research at Adelaide University, CASA is currently developing a trial fatigue management system with a specific intention of ensuring that operators consider all duties associated with a pilots employment when designing flight and duty time schedules. As an outcome of this trial, CASA anticipates that identified fatigue management principles would not be restricted to situations where limited numbers of pilots were retained. CASA notes that the International Civil Aviation Organisation (ICA0) Operations Panel is also monitoring the outcomes of this trial, for possible reflection in ICAO flight and duty time requirements. CASA undertakes to advise the ATSB of the outcomes of this fatigue management system trial as this matter progresses.
CASA acknowledges the intent of this recommendation and advises that to the Authority has taken significant steps to ensure that CASA audit teams have expertise in all relevant areas, including human factors and management processes. As the ATSB is aware, CASA, through audits of operators management systems, aims to assess how effectively operators are discharging their safety responsibilities. As part of CASA is safety systems approach, multidisciplinary teams are used to allow a wider approach to the audit task, thus ensuring that expertise in human factors and management processes is available during the conduct of the audit. Moreover, this process ensures that a level of consistency of audit findings is reached due to the wider availability of cross functional views and approaches. This approach is supported through the development of targeted training courses, such as CASA's Human Factors for the Safety Regulator. This course is designed to assist CASA is Flying Operations Inspectors, Air Worthiness Inspectors, Air Worthiness Engineers, Aerodrome Inspectors, Dangerous Goods Inspectors and Cabin Safety Specialists with the subject of human factors as a discipline and to explore its application in the development and maintenance of aviation safety and in the investigation of subsequent safety breaches. CASA considers that the introduction of multidisciplinary audit teams, in conjunction with the development of the safety systems approach and targeted training, satisfies the requirements of this recommendation.
CASA acknowledges the intent of this recommendation and advises that the procedures and training for operations on wet or contaminated runways are comprehensively addressed in proposed Civil Aviation Safety Regulation Part 121 A - Air Transport Operations -- Large Aeroplanes, which is scheduled for release for interested party consultation in April 2002 as a Notice of Proposed Rule-making (NPRM). Appendix 1 to proposed CASR part 121A.965 -- Recurrent Training and Checking -- Pilots, contains the following: A Recurrent Training Recurrent training must comprise: 1. Ground and a refresher training i the ground and refresher training must include: a aeroplane systems; b operational procedures and requirements including those relating to wet and contaminated runways, ground de/anti icing and flight crew member incapacitation; and c accident\incident and occurrence review. ii knowledge of the ground and refresher training must be verified by a question near or other suitable methods. In addition to the proposed legislation, high-capacity jet aircraft procedures for operations on wet and contaminated runways are also addressed in the company's operations manual. Subparagraph 1.1 (k) of the CA0 requires the inclusion of "instructions for determining that the aircraft performance is adequate under prevailing conditions in respect of the runway to be used", and in subparagraph 1.1 (0) requires the inclusion of information covering "procedures for operating in severe weather conditions involving ice, tail, thunderstorms, turbulence or potentially hazardous meteorological conditions". While these requirements are general in nature, they clearly capture requirements that can operations manual should contain instructions and procedures covering operations with tropical rainfall

ATSB Response
Closed-Not Accepted
Closed-Accepted
Open
Closed-Not Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Monitor
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20000285	Initial Response	24/04/2001	24/05/2001	30	Recommendation	AirServices Australia
R20000294	Initial Response	29/03/2001	25/05/2001	-	Recommendation	AirServices Australia
R20000294	Further correspondence	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000295	Initial Response	29/03/2001	25/05/2001	-	Recommendation	AirServices Australia
R20000295	Further correspondence	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000296	Initial Response	29/03/2001	25/05/2001	-	Recommendation	AirServices Australia
R20000296	Further correspondence	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000297	Initial Response	29/03/2001	25/05/2001	-	Recommendation	AirServices Australia
R20000297	Further correspondence	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000298	Initial Response	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000299	Initial Response	29/03/2001	25/05/2001	-	Recommendation	AirServices Australia
R20000299	Further correspondence	29/03/2001	21/12/2001	267	Recommendation	AirServices Australia
R20000300	Initial Response	24/04/2001	22/06/2001	59	Recommendation	Civil Aviation Safety Authority
R20000301	Initial Response	19/10/2001	3/10/2001	Action completed during investigation	Recommendation	AirServices Australia
R20000302	Initial Response	19/10/2001	3/10/2001	-	Recommendation	AirServices Australia

Safety Finding
Communication of non-work related stress and ATC performance
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Sydney TAAATS UPS Failure
Situational awareness by pilots OCTA
Recency requirements for ATC
Recency requirements for ATC

Safety Issue
As a result of the investigation the Australian Transport Safety Bureau recommends that Airservices Australia review their risk mangement strategies with a view to developing procedures to assist in the identification of controllers that may be unfit for operational duty.
The Australian Transport Safety Bureau recommends that Airservices Australia introduce Team Resource Management Concepts as part of Electrical Technical officer initial and recurrent training.
The Australian Transport Safety Bureau recommends that Airservices Australia introduce Team Resource Management Concepts as part of Electrical Technical officer initial and recurrent training.
The Australian Transport Safety Bureau recommends that Airservices Australia perform a task analysis to determine what tasks electrical technical officers carry out. From this task analysis, role clarification should be developed.
The Australian Transport Safety Bureau recommends that Airservices Australia perform a task analysis to determine what tasks electrical technical officers carry out. From this task analysis, role clarification should be developed.
The Australian Transport Safety Bureau recommends that Airservices Australia review the content of Airways Engineering Instructions for the maintenance and testing of UPS equipment.
The Australian Transport Safety Bureau recommends that Airservices Australia review the content of Airways Engineering Instructions for the maintenance and testing of UPS equipment.
The Australian Transport Safety Bureau recommends that Airservices Australia review the design of STARS and Instrument approaches with a view to improving separation assurance during communications or radar failure.
The Australian Transport Safety Bureau recommends that Airservices Australia review the design of STARS and Instrument approaches with a view to improving separation assurance during communications or radar failure.
The Australian Transport Safety Bureau recommends that Airservices Australia review curfew operations in regard to providing a greater level of segregated airspace.
The Australian Transport Safety Bureau recommends that Airservices Australia review the training of electrical technical officers on operational equipment.
The Australian Transport Safety Bureau recommends that Airservices Australia review the training of electrical technical officers on operational equipment.
The Civil Aviation Safety Authority, in conjunction with Airservices Australia, review the existing airspace model with a view to enhancing conflict recognition and resolution for fare-paying passenger operations to/from non-controlled aerodromes.
The Australian Transport Safety Bureau recommends that Airservices Australia review the documentation in relation to air traffic controller recency requirements, in particular, the methodology of how individuals can meet the requirements.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the requirements for air traffic controller recency and specify the number of hours required, the shifts that do or do not qualify for such recency, and the documentation for recording such recency.

Organisation Response

I am writing in response to the above report [BO/200002379], which relates to an incident involving an A320 Airbus, VH-HYX, and a Boeing 767, VH-OGS, which occurred 222km SSE of Alice Springs on 9 June 2000. I refer also to my letter of 30 January 2001 in which I responded to the draft Aviation Occurrence Brief on this incident and Interim Recommendation R20000285, which has been issued as Recommendation R20000285. In the above letter, I stated that Airservices essentially agreed with the factual findings of the report, however I must point out that the Airservices investigation did not find any reason to indicate that the controller was fatigued. In fact the Airservices investigation report states at section 2.3 Personnel, that the controller "seemed bright and cheerful prior to sitting at the workstation". Whilst we do not accept there is any real evidence that fatigue necessarily contributed to this incident I must point out that Airservices has coincidentally instigated development of a fatigue management program aimed at assisting controllers and management in identifying and managing fatigue in the workplace. Airservices stands by its statements regarding Recommendation R20000285 which are reiterated below for your information. "Recommendation R20000285 The Civil Aviation Regulations clearly state that the onus is on the officer to ensure that they must not exercise the privileges of an air traffic controller licence if they are not fit in accordance with those Regulations: CAR 105 Medical unfitness of holder of licence "Where a person, being: (a) the holder of an air traffic control licence.... suffers an incapacity..... that is likely to impair his or her efficiency in performing the duties..... he or she shall not perform those duties." CAR 6.16A Holder of medical certificate: impaired efficiency due to illness "The holder of a medical certificate must not do an act authorised by the ..... licence to which the certificate relates while..... impaired to any extent by an illness or injury, no matter how minor." To ensure that this responsibility is clearly understood by all personnel, Airservices intends to affix a statement to this effect to air traffic control licences and to handover/takeover sheets. Air traffic controllers will be required to attest to their fitness at the commencement of each shift. Airservices' Directorate of Safety and Environment Assurance now assesses air traffic control rosters against the Centre for Fatigue Research "Fatigue Analyser" to identify any rosters which in themselves may induce fatigue. We are also looking at other fatigue analysis tools to further assess this issue. Notwithstanding that the onus is on operational personnel, Airservices has reminded line managers and Team Leaders of their duty of care responsibility to monitor the wellbeing of their staff and to ensure, to the extent possible, that staff are fit for duty. The Civil ATS Operations Administration Manual states at Page 5-23 under the heading Team Leader/Line ManagerlOR Manager actions: "When advised..... and doubt exists about the fitness of a person to work, that person must be stood down from operational duties..." Airservices considers that it already has in place measures to ensure, to the extent possible, that management are aware of and respond to instances in which officers are not fit for duty. These measures have been reviewed as a result of this incident. As Airservices has already
Preliminary examination of electrical maintenance activity has identified only 2 Airways Engineering Instructions (AEI), 3.4053 and 3.3301, where 2 people are needed to carry out the tasks. This is for other than Occupational Health and Safety or electrical safety considerations. The simple nature of the tasks is such that Team Resource Management is considered inappropriate. However, there may be a management need in these situations for coordination of actions prior to commencement of the task. Airservices proposes to amend the AEI to include this requirement. The AEI check list will also be amended to record the completion of the activity.
A task analysis was completed in June 2000. Recommendations deriving from that analysis cover procedures, Techcert, training and impact on ATM: a. Procedures. That the TAAATS Power system manager consider modifying AEI-3.4090 and 3.4091 to a format similar to AEI 3.4088 and all new switching AEIs follow that same format. b. TechCert. The ISS Technical Support Manager consider the inclusion of prerequisite training in the competency criteria of ISS: F061-Power Systems - Sydney TAAATS. The ISS Technical Support Manager also review the need for TechCert assessment on small network based systems such as MDPDS and CATIS. c. Training. That the Sydney Maintenance Services Manager consider re-familiarisation training for staff who have limited exposure to complex systems and also evaluate the requirement to conduct overview training for Sydney Services staff on other NAS systems that interact with systems maintained by them, ie VSCMS and CATIS. d. Impact of maintenance activities on ATM. That the Sydney Maintenance Services Manager consider awareness training for MS staff on the consequences for ATC in the event of single, or multiple, NAS facility outages. Completion of the above actions is scheduled for 30/12/2001 ATSB Note: The above actions were completed by 22
The required maintenance tasks are defined in Airways Engineering Instructions and individual staff roles and tasks are defined in procedures and job descriptions. A preliminary analysis of tasks is in progress, the results of which will determine if Airways Engineering Instructions need further change. Changes where identified will be implemented.
Director Safety and Environment Assurance A task analysis was completed in June 2000. Recommendations deriving from that analysis cover procedures, Techcert, training and impact on ATM: a. Procedures. That the TAAATS Power system manager consider modifying AEI-3.4090 and 3.4091 to a format similar to AEI 3.4088 and all new switching AEIs follow that same format. b. TechCert. The ISS Technical Support Manager consider the inclusion of prerequisite training in the competency criteria of ISS: F061-Power Systems - Sydney TAAATS. The ISS Technical Support Manager also review the need for TechCert assessment on small network based systems such as MDPDS and CATIS. c. Training. That the Sydney Maintenance Services Manager consider re-familiarisation training for staff who have limited exposure to complex systems and also evaluate the requirement to conduct overview training for Sydney Services staff on other NAS systems that interact with systems maintained by them, ie VSCMS and CATIS. d. Impact of maintenance activities on ATM. That the Sydney Maintenance Services Manager consider awareness training for MS staff on the consequences for ATC in the event of single, or multiple, NAS facility outages. Completion of the above actions is scheduled for 30/12/2001 ATSB
This task is in progress. The relevant Airways Engineering Instructions have been reviewed and republished. Verification is currently occurring to ensure that the issues raised in the various reports have all been considered.
A review of the AEI was conducted and AEI 3.4053 issue 5 published.
Strategic separation assurance is built into Airservices' procedures (eg. SID/STAR arrangement) and these procedures are generally applicable within 20NM of Sydney Airport. From that point tactical separation, including where practicable, separation assurance is applied as necessary. Application of a more rigid strategic separation assurance methodology within the 20NM radius would adversely affect traffic management flexibility and capacity. Airservices has reviewed current procedures and as a result considers that the current arrangements provide sufficient defence in the event of communications or radar failure. In the incident that is the subject of this report, separation was maintained throughout. Airservices is conducting a further review of existing procedures to ensure consistency of application and publication.
A review as recommended has been conducted at Sydney. Amendments deriving from the review will be a review as recommended has been conducted at Sydney. Amendments deriving from the review will be published in DAP on 14 Feb. and in ERSA in March. Completion date extended to March in line with the above.
Airservices Sydney office is conducting a comprehensive review of Sydney Airport curfew operations. A risk assessment of curfew operations at Sydney was documented in a Safety Case and completed in July 2001.
The review is in progress. Whilst the initial review is focused on Sydney electrical maintenance the findings will be considered nationally. Senior management has separately examined the policy on training on operational equipment and has proposed a revised policy restricting such training to specifically assessed and approved cases.
A review has been completed. The enhanced Techcert certification introduced within the last year for electrical technical officers assesses more elements than the previous Techcert process.
Although no response was received from CASA, the following response was received from Airservices Australia and is considered to represent both agencies: Airservices Australia accepts the recommendation although, as detailed below, current circumstances are vastly different from that experienced at the time of this incident. The process to address the recommendation is already well under way, and the airspace model that was in use when this incident occurred no longer exists. When the incident occurred, Flight Service provided Directed Traffic Information. Airservices Australia now provides all traffic information services in low level airspace from the Enroute TAAATS centres. This has enhanced safety by providing pilots with radar advisory services (where radar coverage exists) as a part of normal services. Airservices Australia is working with Industry and CASA to finalise the Low Level Airspace Management Plan (LAMP). LAMP is designed to provide a higher level of service to fare paying passenger operations by increasing the amount of Class E airspace (controlled) throughout Australia, and to simplify frequency management and broadcast procedures in Class G airspace. Improved frequency management will be achieved by ensuring that terminal operations below controlled airspace are managed on a single frequency, thereby reducing the possibility of missed communications between pilots. Simplified frequency management in Class G airspace enhances the ability to manage radio alerted traffic information broadcasts between pilots.
The requirements for recency emanate from Civil Aviation Order 50.1. These requirements were reviewed during the development of the proposed Civil Aviation Safety Regulations (CASRs) and translated into the proposed Regulations. Airservices details the working arrangements associated with these requirements in the Civil ATS Operations Administration Manual (CATSOAM) Section 7-2. Having already undertaken a review of CAO 50.1, I see no reason to undertake another one. Airservices therefore rejects R20000301. Conformance with recency requirements is a controller responsibility. There are clear guidelines published to assist controllers in this responsibility.
Whilst this recommendation is not on Airservices, it could directly affect our operations. As stated above the requirements for recency are specified in CATSOAM, much of which are adopted in the proposed CASRs. Prescribing "suitable shifts" is neither practical nor realistic given the diversity of traffic patterns and the variables in weather and other elements affecting traffic. Please contact me if you require any further information.

ATSB Response
Closed-Partially Accepted
Monitor
Closed-Accepted
Monitor
Closed-Accepted
Monitor
Closed-Accepted
Monitor
Closed-Accepted
Closed-Accepted
Monitor
Closed-Accepted
Closed-Accepted
Closed-Accepted
Response Not Required

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20000302	Initial Response	19/10/2001	10/10/2001	-	Recommendation	Civil Aviation Safety Authority
R20010015	Initial Response	9/03/2001	19/04/2001	41	Recommendation	Civil Aviation Safety Authority
R20010016	Initial Response	9/03/2001	19/04/2001	41	Recommendation	Civil Aviation Safety Authority
R20010033	Initial Response	16/02/2001	3/09/2001	199	Recommendation	Civil Aviation Safety Authority
R20010034	Initial Response	16/02/2001	3/09/2001	199	Recommendation	Civil Aviation Safety Authority
R20010037	Initial Response	16/02/2001	3/09/2001	199	Recommendation	Civil Aviation Safety Authority
R20010038	Initial Response	16/02/2001	3/09/2001	199	Recommendation	Civil Aviation Safety Authority
R20010040	Initial Response	16/02/2001	3/09/2001	-	Recommendation	Civil Aviation Safety Authority
R20010040	Further correspondence	16/02/2001	6/09/2002	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
Recency requirements for ATC
CASA surveillance documentation
CASA surveillance documentation
Outcomes from Maintenance Safety Survey
Outcomes from Maintenance Safety Survey
Outcomes from Maintenance Safety Survey
Outcomes from Maintenance Safety Survey
Outcomes from Maintenance Safety Survey
Outcomes from Maintenance Safety Survey

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the requirements for air traffic controller recency and specify the number of hours required, the shifts that do or do not qualify for such recency, and the documentation for recording such recency.
The Australian Transport Safety Bureau recommends the Civil Aviation Safety Authority consider revising Civil Aviation Safety Authority Safety Aircraft Surveillance Report 604 form to require a response date for acquittal of discrepancies.
The Australian Transport Safety Bureau recommends the Civil Aviation Safety Authority consider revising Civil Aviation Safety Authority Safety Trend Indicator form to indicate organisational non-acquittal of Aircraft Surveillance Report ASSP 604 forms within the last 12 months.
The Australian Transport Safety Bureau recommends that CASA ensures through hours of duty limits, or other means, that maintenance organisations manage the work schedules of staff in a manner that reduces the likelihood of those staff suffering from excessive levels of fatigue while on duty.
The Australian Transport Safety Bureau recommends that CASA ensures that Aircraft Maintenance Engineers and Licensed Aircraft Maintenance Engineers are provided with appropriate recurrent training.
The Australian Transport Safety Bureau recommends that CASA when conducting surveillance of maintenance organisations, considers the existence of an error reporting policy as a positive safety indicator.
The Australian Transport Safety Bureau recommends that CASA requires Aircraft Maintenance Engineers and Licensed Aircraft Maintenance Engineers to undergo appropriate human factors training addressing non-technical performance in areas such as coordination, communication and the management of time pressures.
The Australian Transport Safety Bureau recommends that CASA when conducting surveillance of maintenance organisations, ensures that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that equipment is adequately maintained.
The Australian Transport Safety Bureau recommends that CASA when conducting surveillance of maintenance organisations, ensures that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that equipment is adequately maintained.

Organisation Response
At present, CASA standards for controller recency are contained in Civil Aviation Order 50.1. Recency requirements are also included in the draft Civil Aviation Safety Regulation Part 65 regulations, currently before the Minister. Additionally, CASA audits Airservices Australia against the recency requirements contained in the Airservices' Civil Air Traffic Services Operations Administration Manual (CATSOAM). In respect to adequacy, the current and proposed requirements have been reviewed against equivalent requirements for a number of major aviation nations, including the USA, Canada, the UK, and New Zealand. Based on the findings, Australia clearly has the most onerous recency requirements. In the absence of any other compelling reason for change, CASA believes that the current standards are adequate. A table of comparative values is attached. In respect to work shifts that constitute useful recency time, CATSOAM (Page 5-44) provides for controllers being individually responsible for their own recency requirements and for advising their supervisors when those requirements are compromised. Given the highly individual nature of recent experience, this system is currently considered an adequate process of managing personal recency. In respect to documenting/recording recency, CATSOAM (Page 5-44) clearly states: requires management to provide a facility for individuals to record this information; requires the system to have a means of assurance that individuals will meet recency; and makes individuals responsible for recording this information. This system provides a shared responsibility between management and individual and is considered adequate. In respect to the report's analysis of contributing factors, it is not clear whether the controller was actually 'recent' against existing standards. CAO 50.1 requires a controller to have performed duties for a period of seven hours or longer in the preceding 14 days, except that the 14 day period may be extended to not more than 21 days at the discretion of the appropriate authority. Consistent with this, CATSOAM permits a controller who holds a number of similar endorsements to split this time over each endorsement; however, the total duty time must be seven hours or more. According to the report, the controller registered 3.5 hours in the previous 15 days and 9.5 hours in the previous 22 days. Against a 14-day cycle, the controller appears not to have been current. Additionally, it is questionable whether the controller was also current against a 21-day cycle given the possibility of some of the extra time being acquitted on the 22nd day. The report also makes no mention of whether a 21-day cycle using discretionary authority was actually in use. On the basis of the report's current findings on actual recency time, it is possible to consider non-compliance with recency standards as the significant issue, rather than the efficacy of the standards themselves. Therefore, I suggest that the recency factors be re-visited and as a minimum be measured against the actual recency standards. This action would clarify the role of recency in this incident. Thank you for the opportunity to comment on this report. Please do not hesitate to contact me if I can assist you in any other way. Attachment 1 Comparison of recency requirements between different countries Country Requirement Reference Australia Seven hours or longer in the CAO 50.1 preceding 14 days, except that the 14 day period may be extended to not more than 21 days at the discretion of the appropriate authority. New Zealand At least 5 hours of operational duty CAR 65.309(a) during a single shift, within the 65.359 (a immediately preceding 28 days. Canada A check within the previous 12 months CAR 405.05 United Kingdom 90 days CAP 670 Part D Human Resource para 8.2.1. United States Served for at least three of the FAR
In relation to recommendation R20010015: The ASR (Aircraft Survey Report) can be assigned either Code A, B or C. Code A identifies a defect or damage to the aircraft, and requires that maintenance to rectify the defect or damage must be carried out before further flight. This acquittal requirement is very specific in relation to the aircraft operational requirements. However, if the Certificate of Registration (CoR) holder removes the aircraft from service, an actual acquittal date has no relevance. The requirement to perform the maintenance before further flight remains. Code B is a direction under CAR 38(1) to have defects or damaged assessed and rectified as necessary. The Code B direction is used to bring a defect or damage to the attention of the CoR holder, the pilot or operator where: - The inspector considers the defect or damage to be minor, or; - The inspection carried out on the aircraft does not enable proper determination if the defect or damage is major. In which case the C of R holder, the pilot or operator is responsible to have an assessment carried out to determine the true nature of the defect or damage, and have appropriate rectification carried out. While the assessment needs to be done prior to further flight, the rectification might not be accomplished for some time in the future, where, for instance, the defect is minor and falls within the provision of Permissible Unserviceabilities. Code C is used to give the C of R holder formal notification of a non-compliance with a requirement or condition imposed under the regulations and is judged, on the basis of the inspection, not to have an immediate adverse effect on safety. However, the matter is required to be assessed and rectified at the earliest opportunity. As can be seen from the above discussion, it is often the case that an acquittal date cannot practically be imposed at the time of issue of the ASR. However, CASA is currently reviewing the ASR process to see how that process might be more closely monitored.
In relation to recommendation R20010016: Non-acquittal of an ASR within a particular time period does not necessary reflect poorly on an operator. Consequently, for ASR acquittal information to be meaningful, in regards to Safety Trending, would need complex and prescriptive criteria to be developed and followed by CASA inspectors in the field. Depending on the outcome of the review mentioned in Para 2 above, CASA would also explore what useful application that information might have in regard to the Safety Trend
Given that "fatigue was listed as a contributing factor in just over 12% of occurrences", CASA believes that there is clearly a need for the appropriate regulation of this issue. CASA has addressed the issue of hours of duty rules and fatigue management in relation to aircraft maintenance engineers in the proposed Civil Aviation Safety Regulations Part 43 -Maintainers Responsibilities and Part 145 - Approved Maintenance Organisations, (CASR Part 43 and CASR Part 145). Draft regulations for CASR Part 43 were released as a Discussion Paper for public comment on 22 February 2001. A working draft of the proposed regulations for CASR Part 145 was released for public comment on 5 July 2001. Proposed sub-regulation 145.190 requires an approved maintenance organisation to ensure that each maintenance worker takes enough rest as specified in CASR Part 43. Proposed sub-regulation 43.400 (2) specifies the following in relation to an appropriate work schedule for a maintenance worker: - At least 1 period of 24 hours of complete rest away from the workplace in any period of seven days; and - At least 10 hours of complete rest away from the workplace in any day. Proposed sub-regulation 43.400 (3) provides that a maintenance worker must not continue for so long a period that the worker's capacity to carry out the work becomes significantly impaired. I would like to note that the Authority has recently established a Fatigue Management Committee to review fatigue risk management issues, fatigue standards development and implementation. As part of this review, the Committee will be asked to review the fatigue regulations contained in CASR Parts 43 and 145, for consistency against CASA's fatigue management approach. CASA anticipates that following consideration and, if appropriate, incorporation of comments received from interested parties, including the Fatigue Management Committee, CASR Parts 43 and Part 145 will be released as Notices of Proposed Rule Makings for public comment later this year.
CASA has addressed this recommendation through the proposals contained in CASR Part , 945 Subpart F-Personnel. CASR Part 145 provides the following: 145.245 Maintenance Training Program (1) An AMO must provide, for its maintenance staff, a training program that: (a) allows the maintenance staff to retain their skills; and (b) trains the maintenance staff in any new skills that are necessary for their duties. (2) The training program: (a) must be a program that is accepted by CASA; and (b) may be conducted by the AMO, by a recognised foreign training provider or by an MTO. (3) if the AMO conducts maintenance training, the AMO must (a) prepare a course plan, within the meaning given in Part 147; and (b) obtain CASA's approval for the course plan. (4) CASA must approve a course plan that meets any requirements for course plans that are set out in Part 147 and that apply to the AMO's training. (5) An AMO that carries out maintenance training under this regulation must issue a certificate to a person who completes a training program. Maintenance organisations are additionally required under Civil Aviation Regulation 30, to ensure that Licensed Aircraft Maintenance Engineer's are trained for the activities that they undertake, and holders of an Air Operator's Certificate are also required under CAR 214 to provide proper and periodic instruction to their maintenance personnel. Furthermore, Licensed Aircraft Maintenance Engineer's are currently required under Civil Aviation Order 100.90 to be familiar with the aircraft engine; systems or installations, and the maintenance requirements appropriate to the task for which certification is to be made.
CASA acknowledges the intent of this recommendation, and notes that the presence of an error reporting policy may not guarantee a measurable improvement to safety, or be viewed as a positive safety indicator. CASA believes, however, that the Authority's challenge is to encourage the aviation industry to implement an error reporting policy that focuses on systems and future improvements and is not punitive.
CASA has included Human Factors subjects in the revised Aircraft Maintenance Engineer syllabus under CASR Part 147 - Maintenance Training Organisations, ensuring that students are trained in this subject. For current Licensed Aircraft Maintenance Engineers, CAR 30 and CAR 214 Training Programmes should be utilised to deliver Human Factors Training.
When conducting surveillance of maintenance organisations, as part of the Authority's entry control requirements and normal audit activities, CASA reviews ground equipment, tooling and spares holdings for adequacy, and to ascertain that there are systems in place to ensure that maintenance equipment is adequately maintained. In addition, Certificates of Approval issued under CAR 30 covering maintenance, are subject to the following conditions: Each activity the certificate covers must only be carried out at a place where the facilities and equipment necessary for the proper carrying out of the activity are available, and; The activities the certificate covers must be carried out in accordance with a system of quality control that satisfies the requirements of CAR 30 (2D). These conditions require the organisation to have appropriate equipment and tooling, and that the equipment is adequately maintained.
I am writing in relation to an e-mail from [name supplied], ATSB, to [name supplied], Corporate Affairs, CASA. [name supplied] states that he is still seeking information that would allow ATSB to close Air Safety Recommendation 20010040. Air Safety Recommendation 20010040 The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority when conducting surveillance of maintenance organisations, ensures that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that equipment is adequately maintained. The Authority notes that, in their letter dated 5 February 2002, ATSB has classified the response to this Recommendation as "MONITOR". The letter further states that ?ATSB will continue to monitor incidents relating to maintenance issues for the next 6-12 months before reassessing the response to the recommendation". Could I ask for a report of the relevant findings from ATSB's monitoring activities that has prompted [name supplied] to seek further information at this time. The Authority considered that its response, dated 31 August 2001, adequately closed the matter.

ATSB Response
Response Not Required
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Partially Accepted
Closed-Partially Accepted
Monitor
Monitor

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20010040	Further correspondence	16/02/2001	6/11/2002	628	Recommendation	Civil Aviation Safety Authority
R20010072	Initial Response	20/12/2001	2/01/2002	-	Recommendation	Civil Aviation Safety Authority
R20010072	Further correspondence	20/12/2001	4/04/2006	1566	Recommendation	Civil Aviation Safety Authority
R20010083	Initial Response	5/04/2001	1/06/2001	-	Recommendation	Civil Aviation Safety Authority
R20010083	Further correspondence	5/04/2001	18/04/2002	378	Recommendation	Civil Aviation Safety Authority
R20010085	Initial Response	11/12/2001	22/02/2002	73	Recommendation	Civil Aviation Safety Authority
R20010092	Initial Response	12/04/2001	14/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20010092	Further correspondence	12/04/2001	27/06/2003	-	Recommendation	Civil Aviation Safety Authority
R20010092	Further correspondence	12/04/2001	31/10/2006	2028	Recommendation	Civil Aviation Safety Authority
R20010093	Initial Response	12/04/2001	14/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20010093	Further correspondence	12/04/2001	31/10/2006	2028	Recommendation	Civil Aviation Safety Authority
R20010123	Initial Response	3/12/2001	20/03/2002	107	Recommendation	Civil Aviation Safety Authority

Safety Finding
Outcomes from Maintenance Safety Survey
Incorrect method of simulating an engine failure in turbo-propeller aircraft.
Incorrect method of simulating an engine failure in turbo-propeller aircraft.
Wire strike
Wire strike
ENG - The use of refrigerant HFC-134a in aircraft fitted with the vapour cycle airconditioning systems.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
ENG - Use of Inconel 625 alloy during the weld repair of the high-pressure turbine blades.

Safety Issue
The Australian Transport Safety Bureau recommends that CASA when conducting surveillance of maintenance organisations, ensures that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that equipment is adequately maintained.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority publish information for the guidance of operators and pilots regarding the correct procedures for simulating engine failures in turbo-propeller aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority publish information for the guidance of operators and pilots regarding the correct procedures for simulating engine failures in turbo-propeller aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority: (i) require the fitment of approved Wire Strike Protection System kits for all helicopters engaged in low flying activities for which a kit exists; and (ii) that only agricultural spray kits compatible with Wire Strike Protection Systems be approved for fitment to these helicopters. This recommendation was previously issued by the Bureau of Air Safety Investigation as R19950120.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority: (i) require the fitment of approved Wire Strike Protection System kits for all helicopters engaged in low flying activities for which a kit exists; and (ii) that only agricultural spray kits compatible with Wire Strike Protection Systems be approved for fitment to these helicopters. This recommendation was previously issued by the Bureau of Air Safety Investigation as R19950120.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the potential side effects on humans of the cocktail of HFC-134a refrigerant, in its gaseous form, and the associated lubricant. If that review finds the use of such materials is significantly adverse to human health, the use of HFC-134a refrigerant and its associated lubricant as an airconditioning refrigerant in pressurised aircraft should also be reviewed.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take steps to ensure that the continuing airworthiness requirements for Australian registered Class A aircraft are not compromised through any lack of action by the national airworthiness authorities of other countries.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take steps to ensure that the continuing airworthiness requirements for Australian registered Class A aircraft are not compromised through any lack of action by the national airworthiness authorities of other countries.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take steps to ensure that the continuing airworthiness requirements for Australian registered Class A aircraft are not compromised through any lack of action by the national airworthiness authorities of other countries.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take responsibility to ensure that all service bulletins relevant to Australian registered Class A aircraft are received and assessed for safety of flight implications. The assessment process should ensure that those aspects affecting the safety of flight of Class A aircraft are implemented or mandated as necessary and that appropriate systems are in place to ensure compliance.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take responsibility to ensure that all service bulletins relevant to Australian registered Class A aircraft are received and assessed for safety of flight implications. The assessment process should ensure that those aspects affecting the safety of flight of Class A aircraft are implemented or mandated as necessary and that appropriate systems are in place to ensure compliance.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority notify all operators using CFM56-2C, CFM56-2A/2B, CFM56-3 or similar engines of the possibility of catastrophic engine failure due to failure of high-pressure turbine blades repaired using Inconel 625 alloy consumables.

Organisation Response
Thank you for your letter of 20 September 2002 which relates to Air Safety Recommendation 20010040. The view of the ATSB is that the Air Safety Recommendation has still not been adequately addressed by CASA. Air Safety Recommendation R20010040: The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority when conducting surveillance of maintenance organisations, ensures that ground equipment, tooling and spares holdings are appropriate, and that there are systems In place to ensure that equipment is adequately malntalned, The Authority Instigated a systems audit approach in 1999, at first In the High Capacity Regular Public Transport sector of the Industry and later In the Low Capacity Regular Public Transport sector. The systems audit approach is based on the management system model and consists of four 'Systems Attributes', namely, 'Management Responsibility', 'Infrastructure', 'Processes' and 'Monitoring & Improvement'. The lessons learned so far have been noted and are being addressed in the writing of a new surveillance procedures manual, which is nearing completion. Prior to introduction of the manual, CASA surveillance staff will be provided with comprehensive training In the use of the procedures. The training Is expected to be completed in the first quarter of 2003 and will be followed up by an on the job monitoring and mentoring process. When the Authority has completed the training of its surveillance staff in the new procedures, CASA will publish the manual on the CASA internet site. However, as an indication of the contents of the manual, I have enclosed two extracts from the draft manual. One is an extract from the chapter 'Audit Approach'. It shows the attribute 'Infrastructure' and its components. The other is an extract from the chapter 'Audit Preparation'. It deals with the requirements for audit preparation with respect to the same attribute. Thank you for bringing this matter to the attention of the Authority.
CASA advised that the authority will issue an amendment to Civil Aviation Advisory Publication (CAAP) 5.23-1(0). The amendment will highlight appropriate engine-out training procedures, and include a recommendation that engine-out performance in turbo-propeller aeroplanes be simulated by the use of an appropriate torque setting, rather than loading the aircraft to 90 per cent of MAUW as presently recommended. To support this amendment, CASA's Aviation Safety Compliance Division, as part of scheduled surveillance, will ensure that operators' manuals contain appropriate procedures for the conduct of multi-engine training, and that targeted surveillance is performed on operators of turbo-propeller aeroplanes conducting multi-engine training. To highlight this important safety initiative to the aviation industry, CASA will draw attention to appropriate engine-out training procedures during forthcoming safety promotion activities.
The Civil Aviation Safety Authority have advised that they intend to revise and re-issue CAAP 5.23-1(0) by December 2006. In July 2007, the Civil Aviation Safety Authority issued CAAP 5.23-2(0) Multi-engine Aeroplane Operations and Training.
CASA has generally been of the view that regulation which requires fitment of WSPS would represent an unfair imposition on operators of helicopters capable of fitment of such devices. To regulate against helicopters incapable of fitment of WSPS would unfairly penalize the operators of such helicopters. Thus, CASA chose to leave the fitment of WSPS as voluntary, while continuing to publish the benefits of wire strike protection and the dangers inherent in low-level operations. Despite that position, CASA is sympathetic to the ATSB recommendation and has initiated discussions with the manufacturer of WSPS (Bristol Aerospace Limited) and representatives of the Australian helicopter industry with the aims of: 1. identifying those helicopters which are both capable of fitment of WSPS and at risk from wire strike accidents; 2. improving the level of awareness of wirestrike hazards; 3. devising better methods of detection of wires; and 4. devising a strategy which will increase the level of fitment of protection systems. While not pre-empting the results of the discussions, it is worth noting that the aviation regulatory authorities in the US and Canada have each issued Advisory Circulars highlighting the benefits of WSPS. However, neither authority has mandated their use due to the potential discriminatory
I refer to your letter dated 10 March 2002 relating to Recommendation R20010083 and the fitment of Wire Strike Protection Systems (WSPS) on agricultural helicopters. Since the date of our response to this Recommendation, CASA has had extensive contact with the Bristol Aerospace Division of Magellan Aerospace Corporation, the manufacturers of WSPS. The company has confirmed the efficacy of the WSPS against cables up to 9.Smm with a breaking strength of 55kN and the availability of WSPS kits for a range of helicopters in the medium to heavy category. They have advised that their efforts to address the lighter (piston engine) helicopter market have been limited due to the lack of structure typical of these aircraft and the limitation on how much additional weight can be added. They were planning to assess the feasibility of designing equipment specifically for this market with a decision expected by end 2001/early 2002. To date, no further advice has been received from the manufacturers. The benefits of WSPS are widely known within the helicopter industry but due to limitations in the system and its limited availability for the lighter helicopters, CASA cannot mandate its use. However CASA does take every opportunity to highlight the benefits of such systems and is monitoring the development of alternative systems for protection against the effects of wire strikes.
Dear Sir, I refer to Air Safety Occurrence Report 200005948 on the serious incident involving a Beech Super King Air aircraft, VH-KFN, which occurred 102km west of Southern Cross, WA on 2 December 2000. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010085 and R20010124, the Civil Aviation Safety Authority advises the following: Recommendation R20010085 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the potential side effects on humans of a mix of cocktail of HFC-134a refrigerant, in its gaseous form, and the associated airconditioning system lubricant. If that review finds the use of such materials is significantly adverse to human health, the use of HFC134a refrigerant and its associated lubricant as an airconditioning refrigerant in aircraft should also be reviewed. Recommendation R20010124 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise the aviation industry of the potential side effects on humans of the mix or cocktail of HFC-134a refrigerant, in its gaseous form, and the associated lubricant. HFC-1 34a is the manufacturer-approved agent used in the aircraft airconditioning system. Following the release of the ATSB recommendations, CASA sought comment regarding both the agent and the system lubricant from the FAA and the agent manufacturer. Copies of their responses are enclosed. Their advice confirms that HFC-1 34a has been very widely tested for toxicity. Two reasons for the major testing program is that HFC-1 34a is widely used as the propellant in Ventolin dispensers and the agent is also widely used for fire suppression, both of which applications can expose humans directly to the agent in the gaseous form. Subsequent to issue of your final report we sought a separate independent consideration of the subject by a professor of the university of NSW. He concluded that the incident was most probably a result of a combination of factors, including; HFC-1 34a, the lubricating oil, the cable tie emissions, and hypoxia. He supported acceptance of the FAA review, but cautioned that some special factors in aircraft may not have been thoroughly tested during the program to test HFC-1 34a, such as: aircraft operate with a reduced cabin pressure, which may amplify the effect of the agents; and other fumes can react with the agent and amplify any affect, such as heating of plastic (which can produce fumes at temperatures considerably below charring temperature). [name supplied] suggested that CASA should encourage reporting of incidents involving HFC-1 34a and monitor the outcomes of these incidents carefully. CASA has therefore decided to publish an article in Flight Safety Australia noting that HFC-134a is an approved agent, but reminding people of their responsibility to submit defect reports. A copy of the draft article is enclosed. CASA has therefore acted on Recommendation R20010085 and reviewed the potential side effects of HFC-134a and the lubricating oil. The agent manufacturer, the FAA, and an independent review have all confirmed that the substances should be allowed to continue in use. However, CASA has decided to advise industry of the issues involved and to encourage reporting of defects which involve HFC-134a. Finally, HFC-134a and associated lubricating oils are widely used in various forms of transportation, including cars and buses. The vast majority of aviation passengers are carried in aircraft which use engine bleed air for air-conditioning rather than a refrigerant agent, and in relative terms, aviation is a small user of HFC-1 34a.
These recommendations were included as part of the Terms of Reference of CASA's Service Bulletin Review Project. The first stage of this project was completed in September 2001 and was subsequently reviewed by external panels and a world-class expert. CASA considers that the recommendations of the Service Bulletin Review fully meet the intent of the ATSB recommendations. The now consolidated report, including the later two reviews, formed the basis of CASA's implementation plan for Service Bulletins. The formulation of the implementation plan was completed in February 2002. CASA undertakes to advise the ATSB of future developments of the Service Bulletin Review.
Further correspondence concerning this recommendation was received from CASA on 30 January and 27 June 2003. The ATSB considers that there are still unresolved matters in relation to this recommendation and is working with CASA to effect resolution. This recommendation therefore remains open and its status will be reviewed once the issues have been resolved.
In October 2006, CASA issued Notice of Proposed Rule Making NPRM 0604MS, A Proposal to Modernise and Harmonise Rules for the Maintenance of Australian Aircraft and Licensing of Aircraft Maintenance Personnel for industry comment by 27 November 2006.The NPRM addresses the policy outcomes of adopting a regulatory style similar to that proven by the European Aviation Safety Agency (EASA) and would amend Parts 42, 66, 145 and 147 of the Civil Aviation Safety Regulations 1998 (CASRs).
These recommendations were included as part of the Terms of Reference of CASA's Service Bulletin Review Project. The first stage of this project was completed in September 2001 and was subsequently reviewed by external panels and a world-class expert. CASA considers that the recommendations of the Service Bulletin Review fully meet the intent of the ATSB recommendations. The now consolidated report, including the later two reviews, formed the basis of CASA's implementation plan for Service Bulletins. The formulation of the implementation plan was completed in February 2002. CASA undertakes to advise the ATSB of future developments of the Service Bulletin Review.
In October 2006, CASA issued Notice of Proposed Rule Making NPRM 0604MS, A Proposal to Modernise and Harmonise Rules for the Maintenance of Australian Aircraft and Licensing of Aircraft Maintenance Personnel for industry comment by 27 November 2006.The NPRM addresses the policy outcomes of adopting a regulatory style similar to that proven by the European Aviation Safety Agency (EASA) and would amend Parts 42, 66, 145 and 147 of the Civil Aviation Safety Regulations 1998 (CASRs).
Following the release of the ATSB's interim report into this issue, CASA brought this recommendation to the attention of Virgin Blue and Ansett Australia as operators of these, and other similar engine types. In addition, as this incident involved a Qantas aircraft, Qantas are aware of the possibility of catastrophic engine failure die to failure of high-pressure turbine blades repaired using Inconnel 625 alloy consumables and have discussed this matter with the Authority.

ATSB Response
Closed-Accepted
Monitor
Closed-Accepted
Open
Closed-Partially Accepted
Closed-Partially Accepted
Open
Monitor
Closed-Accepted
Open
Closed-Accepted
Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20010124	Initial Response	11/12/2001	22/02/2002	73	Recommendation	Civil Aviation Safety Authority
R20010133	Initial Response	13/08/2001	4/03/2002	203	Recommendation	Civil Aviation Safety Authority
R20010134	Initial Response	13/08/2001	4/03/2002	203	Recommendation	Civil Aviation Safety Authority
R20010168	Initial Response	7/11/2001	11/09/2001	-	Recommendation	Civil Aviation Safety Authority
R20010168	Further correspondence	7/11/2001	6/03/2002	-	Recommendation	Civil Aviation Safety Authority
R20010168	Further correspondence	7/11/2001	14/11/2002	372	Recommendation	Civil Aviation Safety Authority
R20010187	Initial Response	22/04/2002	24/05/2002	32	Recommendation	Civil Aviation Safety Authority
R20010192	Initial Response	18/09/2001	25/02/2002	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
ENG - The use of refrigerant HFC-134a in aircraft fitted with the vapour cycle airconditioning systems.
OPS/ENG - Balloon Gas Tank Fittings
OPS/ENG - Balloon Gas Tank Fittings
Boeing Main Cabin Door Escape Slide Maintenance Documentation
Boeing Main Cabin Door Escape Slide Maintenance Documentation
Boeing Main Cabin Door Escape Slide Maintenance Documentation
Wearing of Parachutes by Pilots of Jump Aircraft
ENG - Arriel engine rear bearing collapse and in-flight engine fires

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise the aviation industry of the potential side effects on humans of the cocktail of HFC-134a refrigerant, in its gaseous form, and the associated lubricant.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with appropriate specialist organisations, develop and promulgate requirements that specify which fuel cylinder fittings are suitable for use in balloons, and suitable configurations for those fittings.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that balloon owners and operators identify and remove gas tank fittings that are not suitable for balloon operations.
The Australian Transport Safety Bureau recommends the Civil Aviation Safety Authority conduct a review of all Boeing jet aircraft maintenance documentation to ensure completeness of main cabin door escape slide deactivation and activation to return to service following maintenance action.
The Australian Transport Safety Bureau recommends the Civil Aviation Safety Authority conduct a review of all Boeing jet aircraft maintenance documentation to ensure completeness of main cabin door escape slide deactivation and activation to return to service following maintenance action.
The Australian Transport Safety Bureau recommends the Civil Aviation Safety Authority conduct a review of all Boeing jet aircraft maintenance documentation to ensure completeness of main cabin door escape slide deactivation and activation to return to service following maintenance action.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, the Australian Parachute Federation and the Australian Skydiving Association review the safety advantages of requiring pilots, where practicable, to wear parachutes during parachute operations.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the adequacy of the Turbomeca Arriel engine MO3 bearing lubrication installation to determine if it meets the applicable design standard requirements to ensure the continued airworthiness of relevant Australian registered aircraft.

Organisation Response
Dear Sir, I refer to Air Safety Occurrence Report 200005948 on the serious incident involving a Beech Super King Air aircraft, VH-KFN, which occurred 102km west of Southern Cross, WA on 2 December 2000. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010085 and R20010124, the Civil Aviation Safety Authority advises the following: Recommendation R20010085 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the potential side effects on humans of a mix of cocktail of HFC-134a refrigerant, in its gaseous form, and the associated airconditioning system lubricant. If that review finds the use of such materials is significantly adverse to human health, the use of HFC134a refrigerant and its associated lubricant as an airconditioning refrigerant in aircraft should also be reviewed. Recommendation R20010124 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise the aviation industry of the potential side effects on humans of the mix or cocktail of HFC-134a refrigerant, in its gaseous form, and the associated lubricant. HFC-1 34a is the manufacturer-approved agent used in the aircraft airconditioning system. Following the release of the ATSB recommendations, CASA sought comment regarding both the agent and the system lubricant from the FAA and the agent manufacturer. Copies of their responses are enclosed. Their advice confirms that HFC-1 34a has been very widely tested for toxicity. Two reasons for the major testing program is that HFC-1 34a is widely used as the propellant in Ventolin dispensers and the agent is also widely used for fire suppression, both of which applications can expose humans directly to the agent in the gaseous form. Subsequent to issue of your final report we sought a separate independent consideration of the subject by a professor of the university of NSW. He concluded that the incident was most probably a result of a combination of factors, including; HFC-1 34a, the lubricating oil, the cable tie emissions, and hypoxia. He supported acceptance of the FAA review, but cautioned that some special factors in aircraft may not have been thoroughly tested during the program to test HFC-1 34a, such as: aircraft operate with a reduced cabin pressure, which may amplify the effect of the agents; and other fumes can react with the agent and amplify any affect, such as heating of plastic (which can produce fumes at temperatures considerably below charring temperature). [name supplied] suggested that CASA should encourage reporting of incidents involving HFC-1 34a and monitor the outcomes of these incidents carefully. CASA has therefore decided to publish an article in Flight Safety Australia noting that HFC-134a is an approved agent, but reminding people of their responsibility to submit defect reports. A copy of the draft article is enclosed. CASA has therefore acted on Recommendation R20010085 and reviewed the potential side effects of HFC-134a and the lubricating oil. The agent manufacturer, the FAA, and an independent review have all confirmed that the substances should be allowed to continue in use. However, CASA has decided to advise industry of the issues involved and to encourage reporting of defects which involve HFC-134a. Finally, HFC-134a and associated lubricating oils are widely used in various forms of transportation, including cars and buses. The vast majority of aviation passengers are carried in aircraft which use engine bleed air for air-conditioning rather than a refrigerant agent, and in relative terms, aviation is a small user of HFC-1 34a.
I refer to Air Safety Occurrence Report 200101065 on the accident involving V-77 (Viva) Cameron Balloon, VH-LPO, which occurred in Evatt, ACT on 10 March 2001. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010133 and R20010134, CASA advises the following: Recommendation R20010133 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with appropriate specialist organisations, develop and promulgate requirements that specify which fuel cylinder fittings are suitable for use in balloons, and suitable configurations for those fittings. CASA has worked with balloon owners and operators, through the Australian Ballooning Federation (ABF) Inc., to promulgate the findings of the investigation into the above accident and to provide feedback in respect of any unsuitable fittings. CASA staff assisted the ABF in drafting the survey and assessing responses. This action has assisted in ensuring that the recommendations have been turned into practice in the immediate term. Responses to date have identified other cases where the same fittings were used on balloon fuel tanks, but where either the tank geometry or use of an elbow fitting retained the rigid part of the attachment to the fuel hoses within the guard ring of the tank. There has also been a suggestion that the orientation of the tanks in the basket can be arranged so as to minimise the risk of a fitting being knocked inadvertently. For the longer term, the Recommendation will be incorporated into proposed Civil Aviation Safety Regulations (CASR) Parts 31 and 115M and supporting guidance material for balloon certification and maintenance. Proposed CASR Parts 31 and 115M will be developed over the next 18 months in consultation with interested parties from the balloon operation, manufacturing and maintenance sectors and the LP gas industry. It is anticipated that these proposed CASR parts will take effect from January 2004. ATSB comment: As at 14 February 2008, the proposed changes to CASRs Parts 31 and 115M have not been completed; however, in light of the undertaking provided above the ATSB reclassifies the response as Closed-Accepted
I refer to Air Safety Occurrence Report 200101[0]65 on the accident involving V-77 (Viva) Cameron Balloon, VH-LPO, which occurred in Evatt, ACT on 10 March 2001. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010133 and R20010134, CASA advises the following: Recommendation R20010134 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that balloon owners and operators identify and remove gas tank fittings that are not suitable for balloon operations. CASA has worked with balloon owners and operators, through the Australian Ballooning Federation (ABF) Inc., to promulgate the findings of the investigation into the above accident and to provide feedback in respect of any unsuitable fittings. CASA staff assisted the ABF in drafting the survey and assessing responses. This action has assisted in ensuring that the recommendations have been turned into practice in the immediate term. Responses to date have identified other cases where the same fittings were used on balloon fuel tanks, but where either the tank geometry or use of an elbow fitting retained the rigid part of the attachment to the fuel hoses within the guard ring of the tank. There has also been a suggestion that the orientation of the tanks in the basket can be arranged so as to minimise the risk of a fitting being knocked inadvertently. For the longer term, the Recommendation will be incorporated into proposed Civil Aviation Safety Regulations (CASR) Parts 31 and 115M and supporting guidance material for balloon certification and maintenance. Proposed CASR Parts 31 and 115M will be developed over the next 18 months in consultation with interested parties from the balloon operation, manufacturing and maintenance sectors and the LP gas industry. It
CASA has reviewed your recommendation and will be discussing the issue with our officers responsible for operators of aircraft equipped with escape slides. Our intention is to determine an appropriate action to ensure operators are made aware of the issue and check their procedures.
In response to Recommendation R200100168, CASA advises the following: CASA has requested our Airline Operations Offices responsible for the airlines operating Boeing Jet aircraft, to take appropriate action to review the airlines' main cabin door escape slide deactivation and reactivation maintenance procedures. CASA has received advice back from one of our Airline Operations Offices with regard to Boeing 737 aircraft. A number of revisions have been made to the airlines' maintenance documentation and procedures including the inclusion of an independent inspection. CASA feels that the amendments have satisfactorily addressed the ATSB Recommendation. A response from our other Airline Operations Office is expected in the near future, at which time CASA undertakes to advise the Australian Transport Safety Bureau of the action undertaken.
Thank you for your letter of 2 September 2002 regarding Recommendation R20010168. You sought a response concerning documentation and proposed revisions from one of the Authority's Airline Offices relating to aircraft other than B737 models. Please accept my apologies for the delay in my reply. A review of the airlines escape slide maintenance procedures has revealed that a considerable amount of effort has been made by the operator to closely analyse the cause of escape slide incidents and remedy the problems found. This review has resulted in a number of procedural and design changes being introduced. A summary of the actions undertaken by the operator is attached for the information of the ATSB. CASA believes that this action satisfactorily addresses the Recommendation. Thank you for bringing this matter to the attention of the Authority. B747 & B767 ? Following any maintenance on the Slide/Raft there is now an additional task card maintenance check and certification requirement to ensure that the safety pin has been removed and stowed. ? Task cards requiring certification are also provided to deactivate/activate the door assist bottle with instructions to fit a safety pin in the door select lever. ? Action has been initiated to introduce a separate check to deactivate/reactivate the slide raft systems at the completion of "C" Checks. An additional task card will also be included to ensure safety pins are not fitted to the slide bottles and are correctly stowed. ? Longer streamers will also be fitted to the safety pins so they will protrude outside the door bustles. ? The airline is also experimenting with a modified (longer) safety pin, which is currently on trial.
CASA accepts the above draft Recommendation. CASA also notes that the wearing of emergency parachutes by the pilots of aeroplanes dropping parachutists has in fact been an "almost universal" common practice for many years, and the experience of this accident will serve to reinforce that practice. The Australian Parachute Federation's "Jump Pilot's Manual", whilst not a mandatory document, contains the very strong advice at paragraph 3.16: "Always wear an emergency parachute while flying jumpers and be briefed by an instructor on its use." CASA therefore anticipates that the recommendation will be well received by all organisations to whom it is addressed.
I refer to your letter dated 18 September 2001 notifying CASA of Air Safety Recommendations which relate to Occurrence No. 200103038 on the serious incident involving a Sikorsky S76C helicopter, VH-EXX, which occurred 45km east of Longford Helicopter Landing Site, Vic on 11 July 2001. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010192 and R20010196, CASA advises the following: Recommendation R20010192 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the adequacy of the Turbomeca Arriel engine M03 bearing lubrication installation to determine if it meets the applicable design standard requirements to ensure the continued airworthiness of relevant Australian registered aircraft. CASA advised the Direction Generale de L'Aviation Civile (DGAC) of the ATSB determination that an engine fire occurred as a result of engine failure. CASA notes that the DGAC does not support the ATSB determination. CASA has no evidence of the Turbomeca Arriel Module 3 bearin`g lubrication system not satisfying turbine engine certification standards. CASA notes that the DGAC, in advice to the ATSB dated 31 December 2001, has determined the Arriel 1 engine complies with the latest requirements of JAR-E-

ATSB Response
Closed-Partially Accepted
Closed-Accepted
Closed-Accepted
Open
Monitor
Closed-Accepted
Closed-Accepted
Open

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20010192	Further correspondence	18/09/2001	25/03/2002	188	Recommendation	Civil Aviation Safety Authority
R20010195	Initial Response	7/09/2001	4/02/2002	-	Recommendation	Civil Aviation Safety Authority
R20010195	Further correspondence	7/09/2001	14/11/2002	-	Recommendation	Civil Aviation Safety Authority
R20010195	Further correspondence	7/09/2001	21/12/2004	1201	Recommendation	Civil Aviation Safety Authority
R20010196	Initial Response	18/09/2001	25/02/2002	-	Recommendation	Civil Aviation Safety Authority
R20010196	Further correspondence	18/09/2001	24/08/2002	340	Recommendation	Civil Aviation Safety Authority
R20010202	Initial Response	26/02/2002	17/05/2002	-	Recommendation	Civil Aviation Safety Authority
R20010202	Further correspondence	26/02/2002	8/09/2002	194	Recommendation	Civil Aviation Safety Authority
R20010203	Initial Response	26/02/2002	17/05/2002	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
ENG - Arriel engine rear bearing collapse and in-flight engine fires
Classification of passenger carrying operations
Classification of passenger carrying operations
Classification of passenger carrying operations
Turbomeca Arriel engine gas generator turbine blade failures
Turbomeca Arriel engine gas generator turbine blade failures
OPS - Requirements for Low Level Helicopter Power Line Inspections
OPS - Requirements for Low Level Helicopter Power Line Inspections
OPS - Requirements for Low Level Helicopter Power Line Inspections

Safety Issue
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the adequacy of the Turbomeca Arriel engine MO3 bearing lubrication installation to determine if it meets the applicable design standard requirements to ensure the continued airworthiness of relevant Australian registered aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider proposing an increase in the operations' classification, and/or the minimum safety standards required, for organisations that transport their own employees and similar personnel (for example contractors, personnel from related organisations, or prisoners, but not fare-paying passengers) on a regular basis. This recommendation applies to all such operations, regardless of the take-off weight of the aircraft involved.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider proposing an increase in the operations' classification, and/or the minimum safety standards required, for organisations that transport their own employees and similar personnel (for example contractors, personnel from related organisations, or prisoners, but not fare-paying passengers) on a regular basis. This recommendation applies to all such operations, regardless of the take-off weight of the aircraft involved.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider proposing an increase in the operations' classification, and/or the minimum safety standards required, for organisations that transport their own employees and similar personnel (for example contractors, personnel from related organisations, or prisoners, but not fare-paying passengers) on a regular basis. This recommendation applies to all such operations, regardless of the take-off weight of the aircraft involved.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority take appropriate action to ensure the continued airworthiness of Australian registered aircraft fitted with Turbomeca Arriel engines incorporating modification TU204.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority take appropriate action to ensure the continued airworthiness of Australian registered aircraft fitted with Turbomeca Arriel engines incorporating modification TU204.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the need to develop and mandate competency standards for low-level aircraft operations, including powerline inspection by helicopters.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the need to develop and mandate competency standards for low-level aircraft operations, including powerline inspection by helicopters.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider instituting an education program for the industry highlighting the impending changes to operational standards to be introduced under Civil Aviation Safety Regulation (CASR) Part 61 and its associated elements, in order to give sufficient lead time for early adoption and implementation.

Organisation Response
Thank you for providing a copy of draft Air Safety Occurrence Report 200103038 and daft Technical Analysis Report No 34/01 on the serious incident involving Sikorsky S76C helicopter VH-EXX which occurred at Brisbane Aerodrome, QLD on 18 October 2001 with recommendations R20010192 and R20010196. It is noted that Australian Transport Safety Bureau (ATSB) specialist staff have been in close communication with CASA officers regarding this Esso S76C engine failure, to the mutual advantage of both parties. The reports are comprehensive and consistent in indicating that Arriel modification TU204 contributed towards the engine failure. CASA's response to recommendations R20010192 and R20010196, which were originally received by CASA in September 2001, was forwarded to the ATSB on 22 February 2002. CASA has reviewed draft Air Safety Occurrence Report 200103038 and reiterates the comments made in our response of 22 February 2002. A copy of this letter is enclosed. [ATSB Note: this letter is the one contained in the
I refer to your letter of 12 September 2001 enclosing a copy of Air Safety Recommendation R20010195 which relates to classification of passenger carrying operations. Please accept my apologies for the delay in my reply. As you are aware, CASA is presently reviewing the standards contained within the existing Civil Aviation Regulations (CARs) and Civil Aviation Orders (CAOs) with regard to the Classification of Aircraft Operations. The input and recommendations contained within Air Safety Recommendation R20010195 will be taken into consideration and addressed as part of this project. The outcome of the review will determine which category employees (and similar personnel such as contractors) are placed and the standards that will apply to their transportation in aircraft. I trust that this review will satisfactorily address the issues raised in this Air Safety Recommendation.
... the draft Classification of Operations policy document is with the Standards Consultative Committee for consultation and it is anticipated that it will go to the Aviation Safety Forum for consultation on the 6th of December 2002. As a result of this consultation, CASA proposes releasing an NPRM early next year to consult with the aviation industry with a view to amend CAR 206 to give effect to changes which would see recommendation R20010195 being adopted.
A Notice of Proposed Rule Making (NPRM) proposing amendments to Civil Aviation Regulation (CAR) 206 issued in March 2003. Responses to this NPRM and the associated review of the Classification of Operations confirmed that the proposed amendment to CAR 206, which would accommodate this recommendation would be problematic. Consequently, CASA has decided proceed only with the other amendments to CAR 206. The associated NFRM is currently with the Department of Transport and Regional Services for clearance prior to Ministerial approval. However, under the new Civil Aviation Safety Regulations, Corp-orate Operations will be classified as Aerial work and will be regulated under CASR Part 132. The carriage of patients and other personnel (other than air transport operations) will be regarded as Aerial Work under subpart pf Part 136 to be titled Emergency and Medical Services Operations. It is proposed that 'Emergency Services Flights' will cover aerial fire-fighting, law enforcement, and search and rescue operations., while 'Medical Services Flights' will cover air ambulance flights, health services flights, and emergency medical services flights. The development of these regulations is proceeding in consultation with industry.
I refer to your letter dated 18 September 2001 notifying CASA of Air Safety Recommendations which relate to Occurrence No. 200103038 on the serious incident involving a Sikorsky S76C helicopter, VH-EXX, which occurred 45km east of Longford Helicopter Landing Site, Vic on 11 July 2001. Please accept my apologies for the delay in my reply. In response to the Recommendations R20010192 and R20010196, CASA advises the following: Recommendation R20010196 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority take appropriate action to ensure the continued airworthiness of Australian registered aircraft fitted with Turbomeca Arriel engines incorporating modification TU204. CASA has been advised that the engine manufacturer, Turbomeca, cancelled the incorporation of Modification TU 204 in 1998. The DGAC has advised of action to be taken to address engines in service incorporating TU204. CASA notes that the DGAC, in advice to the ATSB dated 31 December 2001, advises the DGAC will be issuing an Airworthiness Directive to require the mandatory removal of turbine blades incorporating modification TU 204. The Directive is to be limited to single engine helicopters. CASA will review the DGAC Airworthiness Directive on its receipt and advise the ATSB of the results of that review. CASA looks forward to receiving a final briefing on the conclusions of the ATSB investigation of Occurrence No. 200103038. Thank you for referring this matter to the attention of the Authority.
Thank you for providing a copy of Air Safety Occurrence Report 200103038 on the serious incident involving Sikorsky S76C which occurred 83km east of Longford Helicopter Landing Site, Victoria on 11 July 2001. The Occurrence Report incorporates Recommendation 20010196: The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Authority take appropriate action to ensure the continued airworthiness of Australian registered aircraft fitted with Turbomeca Arriel engines incorporating modification TU204. CASA's response included that it would review the Direction Generale de l'Aviation Civile Airworthiness Directive on its receipt and advise ATSB on the results of that review. The review has been completed and CASA has issued Airworthiness Directive AD/ARRIEL/16 with effect from 8 August 2002. I believe the Authority's action in respect of this Report has been finalised.
Thank you for providing a copy of Air Safety Occurrence Report 200100252 on the accident involving Bell 206 (Jetranger 111) helicopter VH-PHG which occurred 3km north of Bencubbin, WA on 16 January 200I with the following Recommendations, R20010202 The Australian Transport Safety Bureau (ATSB) recommends that the Civil Aviation Safety Authority review the need to develop and mandate competency standards for low-level aircraft operations, Including powerline inspection by helicopters. R20010203 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider instituting an education program for the industry highlighting the impending changes to operational standards to be introduced under Civil Aviation Safety Regulation (CASR) Part 61 and its associated elements, in order to give sufficient lead time for early, adoption and implementation. CASA agrees with the above recommendations and reiterates our advice forwarded to the ATSB in our letter dated 29 January 2002 in response to the draft recommendations. A copy of our letter is enclosed 29 January 2002 I refer to your letter of 12 December 2001 enclosing a copy Of draft Aviation Occurrence Brief 200100252, concerning an accident involving Bell 206 (Jetranger 111) helicopter VH-PGH. CASA has the following comments on the draft recommendations in the report, Draft Recommendation A CASA should develop and mandate Competency standards for low-level operations, including powerline inspections by helicopters CASA agrees and is currently developing appropriate standards. Draft Recommendation B CASA should Institute an education program for industry highlighting impending changes to operational standards to be Introduced under CASR Part 61 and its associated elements, in order to give sufficient lead time for early adoption and implementation. CASA agrees and this will form part of the implementation strategy of proposed Civil Aviation Safety Regulation (CASR) Part 61. Draft Recommendations C to F While these recommendations are not directed to CASA, CASA feels that a further recommendation to the Electricity Supply Association of Australia Ltd (ESAA) could be included in the report; that contracts for the supply of powerline inspection services involving the use of helicopters, specify a requirement for helicopters to be fitted with wire strike protection systems (WSPS). CASA notes that no mention is made in the report that the helicopter was not fitted with a WSPS or of the potential for WSPS to have mitigated the effects of the accident. Thank
Thank you for your letter of 13 August 2002 concerning Wire Strike protection Systems (WSPS) and related Recommendations. The Authority notes your comments regarding Recommendations R20010202 and R20010203 and that you have placed CASA's response to these Recommendations on MONITOR Status. CASA will advise the ATSB of the final rules, as they impact on these Recommendations, developed under Civil Aviation Safety Regulation (CASR) Part 61. To encourage the maximum participation of interested parties in the consultation process for Part 61, the Authority extended the period for receipt of comments to 31 August 2002 and looks forward to the consideration of wide ranging views. The Authority also notes your comments in relation to Recommendation R20010083, a re-issue of R19950120. However, the Authority re-iterates its position, stated in our responses of 1 June 2001 and 18 April 2002, that it does not intend to mandate WSPS. Notwithstanding this position, CASA has made known the benefits of WSPS and the dangers inherent in low-level operations. For example, an article on this subject was published in Flight Safety Australia, July-August 1999. In the last paragraph of your letter, you suggest that CASA "consider encouraging the electricity and wider industry to adopt the full ATSB recommendations through its education programs". Whilst the Authority recognises its broader role, for example the action set out in paragraph 6, it considers that it is the role of ATSB to bring its recommendations to the attention of the appropriate industry associations and for the relevant associations to take appropriate, responsible action. Thank you for bringing the matters to the Authority's attention. ATSB Note: The response was initially classified as Monitor. A similar safety issue was identified during the investigation of a fatal helicopter accident (200600523) in 2006 near Parkes, NSW and are being addressed. On 20 March 2008, the ATSB re-classified the response as Closed - Accepted
Thank you for providing a copy of Air Safety Occurrence Report 200100252 on the accident involving Bell 206 (Jetranger 111) helicopter VH-PHG which occurred 3km north of Bencubbin, WA on 16 January 200I with the following Recommendations, R20010202 The Australian Transport Safety Bureau (ATSB) recommends that the Civil Aviation Safety Authority review the need to develop and mandate competency standards for low-level aircraft operations, Including powerline inspection by helicopters. R20010203 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider instituting an education program for the industry highlighting the impending changes to operational standards to be introduced under Civil Aviation Safety Regulation (CASR) Part 61 and its associated elements, in order to give sufficient lead time for early, adoption and implementation. CASA agrees with the above recommendations and reiterates our advice forwarded to the ATSB in our letter dated 29 January 2002 in response to the draft recommendations. A copy of our letter is enclosed 29 January 2002 I refer to your letter of 12 December 2001 enclosing a copy Of draft Aviation Occurrence Brief 200100252, concerning an accident involving Bell 206 (Jetranger 111) helicopter VH-PGH. CASA has the following comments on the draft recommendations in the report, Draft Recommendation A CASA should develop and mandate Competency standards for low-level operations, including powerline inspections by helicopters CASA agrees and is currently developing appropriate standards. Draft Recommendation B CASA should Institute an education program for industry highlighting impending changes to operational standards to be Introduced under CASR Part 61 and its associated elements, in order to give sufficient lead time for early adoption and implementation. CASA agrees and this will form part of the implementation strategy of proposed Civil Aviation Safety Regulation (CASR) Part 61. Draft Recommendations C to F While these recommendations are not directed to CASA, CASA feels that a further recommendation to the Electricity Supply Association of Australia Ltd (ESAA) could be included in the report; that contracts for the supply of powerline inspection services involving the use of helicopters, specify a requirement for helicopters to be fitted with wire strike protection systems (WSPS). CASA notes that no mention is made in the report that the helicopter was not fitted with a WSPS or of the potential for WSPS to have mitigated the effects of the accident.

ATSB Response
Closed-Not Accepted
Open
Open
Closed-Partially Accepted
Monitor
Closed-Accepted
Monitor
Closed-Accepted
Monitor

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20010203	Further correspondence	26/02/2002	8/09/2002	194	Recommendation	Civil Aviation Safety Authority
R20010251	Initial Response	20/12/2001	28/02/2002	70	Recommendation	Civil Aviation Safety Authority
R20010252	Initial Response	20/12/2001	28/02/2002	70	Recommendation	Civil Aviation Safety Authority
R20010253	Initial Response	20/12/2001	28/02/2002	70	Recommendation	Civil Aviation Safety Authority
R20010257	Initial Response	19/12/2001	6/03/2002	77	Recommendation	Civil Aviation Safety Authority
R20010258	Initial Response	19/12/2001	6/03/2002	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
OPS - Requirements for Low Level Helicopter Power Line Inspections
DFDR not compliant to CASA CAO 20.18
DFDR not compliant to CASA CAO 20.18
DFDR not compliant to CASA CAO 20.18
Reliability of horizontally opposed, six-cylinder, air cooled , aircraft engines
Provision of guidance on ditching to pilots of smaller aircraft

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider instituting an education program for the industry highlighting the impending changes to operational standards to be introduced under Civil Aviation Safety Regulation (CASR) Part 61 and its associated elements, in order to give sufficient lead time for early adoption and implementation.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority ensure that all Boeing 717-200 aircraft on the Australian Register are fitted with a flight recorder system that complies with the requirements of all applicable Australian Civil Aviation Orders.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority review flight recorder start/stop logic for all types in the Australian fleet where a type acceptance certificate has been issued to ensure that the aircraft meets the requirements of the Australian Civil Aviation Orders.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority ensure that all aircraft entering the Australian Register be subject to appropriate scrutiny to ensure that the aircraft complies with the requirements of the Australian Civil Aviation Regulations and Civil Aviation Orders.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the operating and maintenance procedures for high powered piston engines fitted to Australian registered aircraft to ensure adequate management and control of combustion chamber deposits, preignition and detonation.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority educate industry on procedures and techniques that may maximise the chances of survival of a ditching event. Part of that education program should include the development of formal guidance material of the type contained in the UK CAA General Aviation Safety Senses leaflet 21A "Ditching".

Organisation Response
Thank you for your letter of 13 August 2002 concerning Wire Strike protection Systems (WSPS) and related Recommendations. The Authority notes your comments regarding Recommendations R20010202 and R20010203 and that you have placed CASA's response to these Recommendations on MONITOR Status. CASA will advise the ATSB of the final rules, as they impact on these Recommendations, developed under Civil Aviation Safety Regulation (CASR) Part 61. To encourage the maximum participation of interested parties in the consultation process for Part 61, the Authority extended the period for receipt of comments to 31 August 2002 and looks forward to the consideration of wide ranging views. The Authority also notes your comments in relation to Recommendation R20010083, a re-issue of R19950120. However, the Authority re-iterates its position, stated in our responses of 1 June 2001 and 18 April 2002, that it does not intend to mandate WSPS. Notwithstanding this position, CASA has made known the benefits of WSPS and the dangers inherent in low-level operations. For example, an article on this subject was published in Flight Safety Australia, July-August 1999. In the last paragraph of your letter, you suggest that CASA "consider encouraging the electricity and wider industry to adopt the full ATSB recommendations through its education programs". Whilst the Authority recognises its broader role, for example the action set out in paragraph 6, it considers that it is the role of ATSB to bring its recommendations to the attention of the appropriate industry associations and for the relevant associations to take appropriate, responsible action. Thank you for bringing the matters to the Authority's attention. ATSB Note: The response was initially classified as Monitor. A similar safety issue was identified during the investigation of a fatal helicopter accident (200600523) in 2006 near Parkes, NSW and are being addressed. On 20 March 2008, the ATSB re-classified the response as Closed - Accepted
CASA accepts the above Recommendations and will take the following action: 1. CASA wishes to advise the ATSB that all Boeing 717-200 aircraft presently on the Australian Civil Register are operated by the one airline. CASA intends to forward a Civil Aviation Regulation (CAR) 38 Direction to the airline directing it to rectify the deficiency in the flight data recorder (FDR) run/stop logic in its B717 aircraft. 2. Issue an Airworthiness Bulletin that; (i) recommends all Certificate of Registration holders that operate aircraft that require a FDR to be installed to: i. Check the aircraft to ensure compliance with CAO 20.18; ii. Advise CASA through the Service Difficulty Reporting process of any aircraft that do not comply; iii. If the aircraft does not comply, contact the aircraft manufacturer or a CAR 35 person to have the aircraft modified to meet the requirements of CAO 20.18; and (ii) explains to those persons issuing a Certificate of Airworthiness for an aircraft, the requirements for first of airframe/(Flight Data Acquisition Unit (FDAU)/FD combination. 3. Update the CASA Certificate of Airworthiness and Special Flight Permits Manual to ensure that appropriate action is taken in relation to FDRs as part of the initial Certificate of Airworthiness issue. CASA undertakes to provide the ATSB with copies of the CAR 38 Direction, the Airworthiness Bulletin and details of the Certificate of Airworthiness and Special Flight Permits Manual amendments.
Most aeroplanes that are turbine powered and have Minimum Take-Off Weights (MTOWs) exceeding 5700 kg are required by CAO 20.18 to be equipped with flight data recorders (FDR). However, all aeroplanes of one type are not necessarily equipped with the one type of FDR/FDAU. Aircraft manufacturers usually offer a choice of FDR types and may customise a FDAU to record additional parameters required by an operator. The information and documents to be supplied to CASA in support of an application for a Type Acceptance Certificate are specified in sub-regulation 21.29A(b) of the Civil Aviation Regulations. The information and documents required in accordance with this sub-regulation do not include anything related to FDRs. For these reasons, CASA believes it would not be feasible to assess Type Acceptance Certificates or aircraft types that are the subject of Type Acceptance Certificates as a means of ensuring that aircraft meet the requirements for FDR specified in the Civil Aviation Orders. The mandatory parameters required by the standard for FRD's fitted to Australian Aircraft are detailed in CAO 103.19.
CASA accepts the above Recommendations and will take the following action: Issue an Airworthiness Bulletin that; (i) recommends all Certificate of Registration holders that operate aircraft that require a FDR to be installed to: i. Check the aircraft to ensure compliance with CAO 20.18; ii. Advise CASA through the Service Difficulty Reporting process of any aircraft that do not comply; iii. If the aircraft does not comply, contact the aircraft manufacturer or a CAR 35 person to have the aircraft modified to meet the requirements of CAO 20.18; and (ii) explains to those persons issuing a Certificate of Airworthiness for an aircraft, the requirements for first of airframe/(Flight Data Acquisition Unit (FDAU)/FD combination. Update the CASA Certificate of Airworthiness and Special Flight Permits Manual to ensure that appropriate action is taken in relation to FDRs as part of the initial Certificate of Airworthiness issue.
with the Federal Aviation Administration (FAA) New York Aircraft Certification Office and the FAA Atlanta Aircraft Certification Office, CASA advised that one of the primary issues identified in the Whyalla accident was aggressive fuel leaning. CASA advised the New York and Atlanta FAA Offices of the discrepancies identified between the Engine Operating Manual approved by the New York Office and the Aircraft Flight Manual approved by the Atlanta Office. Following these discussions, the Atlanta Office has responded with advice that the FAA is of the opinion that fuel mixture leaning procedures were not a contributing factor in the events of May 2000. This response is not consistent with the findings of the ATSB in regards to the resulting combustion chamber deposits, preignition and detonation. CASA's actions in regards to this recommendation are ongoing, and discussions are being held with the engine manufacturer. CASA undertakes to advise the ATSB of the outcomes of these discussions as they progress. In relation to the maintenance procedures for all high-powered piston engines fitted to Australian registered aircraft, CASA advises that action in relation to this matter is ongoing. CASA intends to review current maintenance procedures applied to all high-powered piston engines fitted to Australian Registered aircraft to ensure compliance with manufacturer's published procedures, and in the opinion of the Authority, this action will provide timely notice of engine distress resulting from combustion chamber deposits. In relation to the operating procedures for all high-powered piston engines fitted to Australian Registered aircraft, CASA advises that the Authority has notified all operators of Textron Lycoming and Teledyne Continental Motors piston engines aircraft of reports of crankshaft bearing failures. To minimise the risk of combustion chamber deposits resulting in abnormal loading of the bearings, CASA has recommended the operators adopt conservative fuel mixture leaning procedures. A copy of this letter is provided for the information of the ATSB. The following is a copy of the letter To all operators of Textron Lycomiag and Teledyne Continental Motors piston engines with a take off power rating greater than 250 horsepower And aircraft maintenance organisations Subject: Lycoming and TCM Crankshaft Bearing and Connecting Rod Bearing Failures Since August 2001, CASA has received 9 major defect reports relating to crankshaft and connecting rod bearing failures. Six of the failures occurred in Lycoming engines and three in TCM engines. All of the failures have occurred at a low bearing time in service. All but one of the reports involved large, high horsepower engines. A preliminary examination of a number of the failed bearings indicates evidence of delamination of the bearing shell layers. That examination result is consistent with undocumented reports of warranty claims against engines exhibiting bearing material in the oil filters of low time in service engines. Textron Lycoming, Teledyne Continental Motors, Superior Air Parts and the FAA have been advised. of the bearing defects being reported in Australia CASA is conducting on-goingdiscussions with Lycoming, TCM and Superior Air Parts on the reported failures. `However, CASA, has been advised; crankshaft bearings can also be supplied by non original equipment manufacturers each with a unique prefix to the original part number. Air Support and Engine Components Incorporated are two such suppliers. An Air Support supplied bearing will have the prefix "AS", eg; AS 13884-M03 Textron Lycoming has advised; bearing delamination detects should not present a safety of flight concern if the engine oil pressure filter and oil pressure screen are inspected for metal contamination at each oil and filter change. Cutting open the filter and examining the filter element as detailed in Lycoming Service Bulletin Number 480D will provide ample opportunity to detect an impending bearing failure. The FAA supports the Lyconung response. Aggressive fuel mixture leaning may be relevant to the reported bearing defects.' The Australian Transport Safety Bureau, in investigating the dual engine failures associated with the fatal Whyalla Airlines Piper PA31-350 accident, noted a relationship between bearing failures and aggressive fuel leaning procedures. The ATSB lists engine operating practices as a contributing factor in that accident. A copy of the ATSB report can be found on the internet at www.atsb.gov.au. The CASA Flight Safety Australia Jan/Feb 2001 "Lean and Mean" article advising of the real costs of aggressive fuel mixture leaning also provides useful information on this subject. Until a full understanding of the causes of the crankshaft bearing failures is obtained, CASA recommends all Lycoming and TCM piston engine powered aircraft operators and applicable maintenance organisations carry out the following precautionary procedures. 1. Fuel mixture leaning procedures detailed in the aircraft manufacturer's flight manual or pilot operating handbook may be different to the procedures recommended by the engine manufacturer. The engine manufacturer may recommend the use of richer fuel mixtures than those approved by the aircraft manufacturer. To limit crankshaft bearing exposure to abnormal combustion loads occurring during aggressive leaning procedures, observe the fuel mixture leaning procedure limits detailed in the engine manufacturer's operators manual. 2. At each engine oil change and filter change, if applicable to the engine model, inspect the oil pressure screen, oil suction screen and cut open the oil filter and inspect the filter element for evidence of metal contamination, Lycoming SB 480D and TCM SB M87-12 Rev.l refer; and 3. Carry out an engine oil change and, if applicable, an oil filter change, at intervals as published by the engine manufacturer, Lycoming SB 480D and TCM SB M87-12 Rev. l refer; and 4. At each engine oil change, drain the oil whilst the engine is still hot and strain the oil through a fine mesh screen filter. If a bearing defect is present, hot oil will flush out bearing material 'flakes. Defects found in carrying out the above recommendation should be reported to CASA on the Major Defect Form available from the CASA website, www.casa.gov.au. CASA is continuing to seek an understanding on the primary cause of the bearing defects, in submitting such defect reports, please include all available information on the supplier and part number of the bearings fitted. SUBSEQUENT RESPONSE RECEIVED FROM CASA ON 21 NOVEMBER 2003. I refer to your letter dated 9 October 2003 addressed to [name supplied] regarding matters raised by the South Australian Coroner in his findings of the accident involving Whyalla Airlines on 31 May 2000. Please accept my apologies for the delay in my reply. The Australian Transport Safety Bureau (ATSB) has requested that the Civil Aviation Safety Authority (CASA) seek further clarification from the Federal Aviation Administration (FAA) on detonation
In response to this recommendation, I have been advised that a Civil Aviation Advisory Publication (CAAP) is currently being prepared to educate the aviation industry on procedures and techniques that may maximise the chances of survival of a ditching event.

ATSB Response
Closed-Accepted
Closed-Not Accepted
Closed-Not Accepted
Closed-Accepted
Closed-Accepted
Monitor

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20010258	Further correspondence	19/12/2001	23/07/2003	581	Recommendation	Civil Aviation Safety Authority
R20020030	Initial Response	24/09/2002	28/10/2002	-	Recommendation	Civil Aviation Safety Authority
R20020030	Further correspondence	24/09/2002	5/02/2002	-	Recommendation	Civil Aviation Safety Authority
R20020030	Further correspondence	24/09/2002	30/06/2003	279	Recommendation	Civil Aviation Safety Authority
R20020036	Initial Response	19/09/2002	3/12/2002	-	Recommendation	AirServices Australia
R20020036	Further correspondence	19/09/2002	6/08/2003	-	Recommendation	AirServices Australia
R20020036	Further correspondence	19/09/2002	29/10/2004	771	Recommendation	AirServices Australia
R20020040	Initial Response	19/09/2002	3/12/2002	-	Recommendation	AirServices Australia
R20020040	Further correspondence	19/09/2002	6/08/2003	321	Recommendation	AirServices Australia

Safety Finding
Provision of guidance on ditching to pilots of smaller aircraft
Seat belt shoulder harness service life
Seat belt shoulder harness service life
Seat belt shoulder harness service life
Situational awareness on aerodromes
Situational awareness on aerodromes
Situational awareness on aerodromes
Situational awareness on aerodromes
Situational awareness on aerodromes

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority educate industry on procedures and techniques that may maximise the chances of survival of a ditching event. Part of that education program should include the development of formal guidance material of the type contained in the UK CAA General Aviation Safety Senses leaflet 21A "Ditching".
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of the continuing airworthiness requirements for seat belts and shoulder harnesses to ensure that they maintain applicable design standards throughout their service life, when installed in Australian registered aircraft and helicopters.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of the continuing airworthiness requirements for seat belts and shoulder harnesses to ensure that they maintain applicable design standards throughout their service life, when installed in Australian registered aircraft and helicopters.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of the continuing airworthiness requirements for seat belts and shoulder harnesses to ensure that they maintain applicable design standards throughout their service life, when installed in Australian registered aircraft and helicopters.
That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allows drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency.
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That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allows drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency.
That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures).
That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures).

Organisation Response
I refer to Aviation Safety Recommendation R20010258 which arose from the accident of 31 May 2000 involving a Piper PA31-350 Chieftain aircraft, VH-MZK. In its reply of 6 March 2002, the Authority advised that it would develop a Civil Aviation Advisory Publication (CAAP) to educate the aviation industry on procedures and techniques that may maximise the chances of survival of a ditching event. CAAP 253-1(0), Ditching, was published in April 2003. The CAAP can be found at http://www.casa.gov.au/download/CAAPs/ops/253-1.pdf The Authority believes that the publication of the CAAP closes its actions on this Recommendation.
The Authority advises that it is unable to give the Recommendation full consideration and provide a response to the Bureau within the time period set out in our MOU. CASA needs to undertake extensive research and consultation on this issue. CASA anticipates being able to develop relevant advisory material and provide a response to the Bureau by end January 2003. The Authority seeks your concurrence to an extension of time for a response.
The Authority acknowledges the intent of the Recommendation. After consideration, the Authority believes that the circumstances relating to the failed seat belt reported in the Occurrence Report are inconclusive and do not allow the determination the specific cause of the loss of webbing strength. However, it is agreed that the seriousness of deterioration of seat belt strength needs to be highlighted to aircraft operators and maintenance organisations. The Authority proposes to raise an Airworthiness Bulletin which will be distributed via the Authority's website. Subsequently, advisory material will be prepared for publication in Flight Safety Australia. ATSB Note: The Civil Aviation Safety Authority issued Airworthiness Bulletin 25-2, Issue 1, titled "Inspection and replacement of seat belts and harnesses" on 4 April 2003.
I refer to Air Safety Occurrence Report 200104604 on the accident involving Bell Jetranger 206B helicopter VH-SVW which occurred 5km west of Kurrajong Heights, NSW on 24 September 2001. The Report included Recommendation R20020030. In its response to the Recommendation, dated 4 February 2003, the Authority proposed to raise an Airworthiness Bulletin, which would be distributed via the Authority's website, and to publish advisory material in Flight Safety Australia. An Airworthiness Bulletin, AWB 25-2 Issue 1, was issued on 4 April 2003. Advisory material was published in the March-April 2003 edition of Flight Safety Australia. Copies are attached for your information. The Authority believes that this closes the actions on this Recommendation.
I write responding to three recommendations which relate to Tower operations and follow incidents in Perth and Tamworth. Recommendation R20020036 That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allow drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency. Airservices Australia accepts this recommendation. In relation to activities in Perth, a number of joint workshops involving the Airport owner in Perth, Airside operators and Airservices Australia have occurred as a result a number of local vehicle operating procedures have been modified to enhance safety. Airservices Australia is committed to working with other parties to investigate ways to effect standardisation at major airports, the aim being to ensure that all vehicles on active runways be required to be on aerodrome control frequency. Airservices Australia will inform the Australian Transport Safety Bureau of progress when this comes to hand. Recommendation R20020040 That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). Airservices Australia accepts this recommendation. It is the intent of Airservices Australia that any traffic management changes identified in the workshops conducted in relation to ATSB recommendation R20020036 be reviewed for national implementation. Airservices Australia however would like to acknowledge that the Civil Aviation Safety Authority has regulatory governance over aspects of airside vehicular operations through CASR 139, and any suggested national changes that effect this regulation would require their agreement. Recommendation 2002 0080 The Australian Transport Safety Bureau recommends that Airservices Australia ensure that procedures for parallel runway operations at Tamworth are in compliance with the Manual of Air Traffic Services. Airservices Australia accepts this recommendation. This recommendation relates to Parallel Runway Operations at Class D Towers specifically Tamworth. Airservices Australia has been working with the Department of Defence, joint author of the Manual of Air Traffic Control, to develop appropriate procedures and then manage their implementation. On the 17`h of October, the group meet with the ATC staff at Tamworth and local operators outlining the solution strategy and discussing implementation. Requests for change have been drafted for AIP and MATS following this input. The aim is to implement the proposed changes at the next MATS AIRAC date, ie 17th April 2003. If you have any queries on these responses, please do not hesitate to
Re ATSB recommendations arising from ATSB Report 200102695 Further to the 14 May 2003 meeting regarding Australian Transport Safety Bureau (ATSB) investigation 200102696 - Sweeper on Runway, please find below Airservices Australia's responses in relation to each of the recommendations made in the investigation report. With respect to ATSB Recommendation 20020036: That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allow drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency. Airport Services have initiated changes to local procedures to ensure that vehicles that will enter and remain on a duty runway shall be controlled on the tower ADC frequency. The following points identify the four towers that require this change and the anticipated changeover date. Perth - Anticipated changeover date: 1 September 2003. Adelaide - Anticipated changeover date: Mid September 2003. Melbourne - Anticipated changeover date: Mid September 2003. Canberra - Anticipated changeover date: Date to be advised (changeover to occur following Melbourne changeover). With respect to ATSB Recommendation 20020040: That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). A meeting between stakeholders was held on 14 May 2003. A copy of the minutes are attached. Airport Services will be requesting a change to CASR 139 MOS 8.10.4 as follows: Delete paragraph 8.10.4.1. Amend paragraph 8.10.4.2 to read: A vehicle used regularly on the movement area must be marked either by using a flashing dome light on top of the vehicle in accordance with Paragraph 9.19.1 or, by day only, by flags. This results in the minimum requirement for airside vehicles to be equipped with either the lights, or flags by day, and removes any reference to preferred colours.
I write to inform you that the action taken following receipt of the above mentioned recommendation is now complete. The recommendation indicated that: Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allows drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency. All vehicles operating on airport runway now monitor the aerodrome controller (ADC) frequency. As such I would request that the ATSB close
I write responding to three recommendations which relate to Tower operations and follow incidents in Perth and Tamworth. Recommendation R20020036 That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allow drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency. Airservices Australia accepts this recommendation. In relation to activities in Perth, a number of joint workshops involving the Airport owner in Perth, Airside operators and Airservices Australia have occurred as a result a number of local vehicle operating procedures have been modified to enhance safety. Airservices Australia is committed to working with other parties to investigate ways to effect standardisation at major airports, the aim being to ensure that all vehicles on active runways be required to be on aerodrome control frequency. Airservices Australia will inform the Australian Transport Safety Bureau of progress when this comes to hand. Recommendation R20020040 That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). Airservices Australia accepts this recommendation. It is the intent of Airservices Australia that any traffic management changes identified in the workshops conducted in relation to ATSB recommendation R20020036 be reviewed for national implementation. Airservices Australia however would like to acknowledge that the Civil Aviation Safety Authority has regulatory governance over aspects of airside vehicular operations through CASR 139, and any suggested national changes that effect this regulation would require their agreement. Recommendation 2002 0080 The Australian Transport Safety Bureau recommends that Airservices Australia ensure that procedures for parallel runway operations at Tamworth are in compliance with the Manual of Air Traffic Services. Airservices Australia accepts this recommendation. This recommendation relates to Parallel Runway Operations at Class D Towers specifically Tamworth. Airservices Australia has been working with the Department of Defence, joint author of the Manual of Air Traffic Control, to develop appropriate procedures and then manage their implementation. On the 17`h of October, the group meet with the ATC staff at Tamworth and local operators outlining the solution strategy and discussing implementation. Requests for change have been drafted for AIP and MATS following this input. The aim is to implement the proposed changes at the next MATS AIRAC date, ie 17th April 2003. If you have any queries on these responses, please do not hesitate to
Re ATSB recommendations arising from ATSB Report 200102695 Further to the 14 May 2003 meeting regarding Australian Transport Safety Bureau (ATSB) investigation 200102696 - Sweeper on Runway, please find below Airservices Australia's responses in relation to each of the recommendations made in the investigation report. With respect to ATSB Recommendation 20020036: That Airservices Australia, in conjunction with airport owners, review the adequacy of equipment and procedures that allow drivers of all vehicles using airport runways to monitor the aerodrome controller radio frequency. Airport Services have initiated changes to local procedures to ensure that vehicles that will enter and remain on a duty runway shall be controlled on the tower ADC frequency. The following points identify the four towers that require this change and the anticipated changeover date. Perth - Anticipated changeover date: 1 September 2003. Adelaide - Anticipated changeover date: Mid September 2003. Melbourne - Anticipated changeover date: Mid September 2003. Canberra - Anticipated changeover date: Date to be advised (changeover to occur following Melbourne changeover). With respect to ATSB Recommendation 20020040: That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). A meeting between stakeholders was held on 14 May 2003. A copy of the minutes are attached. Airport Services will be requesting a change to CASR 139 MOS 8.10.4 as follows: Delete paragraph 8.10.4.1. Amend paragraph 8.10.4.2 to read: A vehicle used regularly on the movement area must be marked either by using a flashing dome light on top of the vehicle in accordance with Paragraph 9.19.1 or, by day only, by flags. This results in the minimum requirement for airside vehicles to be equipped with either the lights, or flags by day, and removes any reference to preferred colours.

ATSB Response
Closed-Accepted
Monitor
Closed-Partially Accepted
Closed-Partially Accepted
Open
Open
Closed-Accepted
Open
Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20020040	Initial Response	19/09/2002	24/10/2002	35	Recommendation	Civil Aviation Safety Authority
R20020053	Initial Response	11/07/2002	6/09/2002	57	Recommendation	Civil Aviation Safety Authority
R20020053	Further correspondence	11/07/2002	8/08/2003	393	Recommendation	Civil Aviation Safety Authority
R20020054	Initial Response	4/11/2002	18/11/2002	-	Recommendation	Civil Aviation Safety Authority
R20020054	Further correspondence	4/11/2002	6/06/2003	214	Recommendation	Civil Aviation Safety Authority
R20020080	Initial Response	3/07/2002	27/11/2002	-	Recommendation	AirServices Australia
R20020080	Further correspondence	3/07/2002	2/12/2002	-	Recommendation	AirServices Australia
R20020080	Further correspondence	3/07/2002	30/03/2005	1001	Recommendation	AirServices Australia
R20020082	Initial Response	19/08/2002	27/09/2002	39	Recommendation	Civil Aviation Safety Authority
R20020101	Initial Response	3/07/2002	1/10/2002	90	Recommendation	Civil Aviation Safety Authority
R20020102	Initial Response	3/07/2002	1/10/2002	90	Recommendation	Civil Aviation Safety Authority
R20020109	Initial Response	3/07/2002	5/09/2002	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
Situational awareness on aerodromes
Adequacy of the B 767 engine fire warning loom protection
Adequacy of the B 767 engine fire warning loom protection
Location of the engine fire bottle on the EMBRAER E110P1 'Bandeirante' aircraft
Location of the engine fire bottle on the EMBRAER E110P1 'Bandeirante' aircraft
Inappropriate use of simultaneous parallel operations at Tamworth
Inappropriate use of simultaneous parallel operations at Tamworth
Inappropriate use of simultaneous parallel operations at Tamworth
Wearing of life jackets during water operations
ENG - Cabin altitude alert/Passenger Oxygen deploy barometric switch maintenance
ENG - Cabin altitude alert/Passenger Oxygen deploy barometric switch maintenance
ENG - Cabin altitude alert/Passenger Oxygen deploy barometric switch maintenance

Safety Issue
That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures).
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of requirements covering protection of the engine fire detector loom wires in Boeing 767 engine compartments.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of requirements covering protection of the engine fire detector loom wires in Boeing 767 engine compartments.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the location of fire bottles on aircraft to reduce the possibility of a premature discharge of fire retardant where the temperature in the area that contains the fire bottle rises above the setting of the fusible valve.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the location of fire bottles on aircraft to reduce the possibility of a premature discharge of fire retardant where the temperature in the area that contains the fire bottle rises above the setting of the fusible valve.
The Australian Transport Safety Bureau recommends that Airservices Australia ensure that procedures for parallel runway operations at Tamworth are in compliance with the Manual of Air Traffic Services.
The Australian Transport Safety Bureau recommends that Airservices Australia ensure that procedures for parallel runway operations at Tamworth are in compliance with the Manual of Air Traffic Services.
The Australian Transport Safety Bureau recommends that Airservices Australia ensure that procedures for parallel runway operations at Tamworth are in compliance with the Manual of Air Traffic Services.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the requirements of Civil Aviation Order 20.11, with respect to the wearing of life jackets, to extend the requirements to the occupants of any aircraft that is standing, taxying, taking-off, landing or approaching to land, on water.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure the adequacy of the maintenance requirements for calibration, functional test and return to service of barometric pressure switches used to activate cabin altitude alerting systems in Australian registered pressurised aircraft engaged in the carriage of fare paying passengers.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure the adequacy of the maintenance requirements for calibration, functional test and return to service of barometric pressure switches used to activate deployment of drop down passenger oxygen masks in Australian registered pressurised aircraft engaged in the carriage of fare paying passengers.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority liaise with the United States Federal Aviation Administration, the United Kingdom Civil Aviation Authority and the European JAA on implementation strategies to address these safety deficiencies.

Organisation Response
Thank you for providing a copy of Air Safety Investigation Report 200102695 on the serious incident involving Boeing 737 aircraft VH-TJY which occurred at Perth International Airport, WA on 18 June 2001. The Report includes Recommendation 20020040: The Australian Transport Safety Bureau recommends that Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). The Authority notes that the wording of this Recommendation is the same as Recommendation B which was included in the draft Report relating to this incident. The Authority's comments on that recommendation, which were provided to the Bureau in a letter of 20 August 2002, also apply to Recommendation R20020040. Thank you for bringing this matter to the attention of the Authority. ATSB Note: The text of the comment by the Civil Aviation Safety Authority relating to draft Recommendation B was as follows: `Thank you for providing a copy of Air Safety Occurrence Report 200102695 on the serious incident involving Boeing 737 aircraft VH-TJY which occurred at Perth Aerodrome WA on 18 June 2001 Recommendation B That Airservices Australia, the Civil Aviation Safety Authority and the Australian Airports Association should jointly review airside vehicle operation with a view to establishing national operating standards and procedures (including vehicle colour, lights and procedures). `The Authority does not support the allocation of resources for such an exercise, beyond steps that are already underway. `The Authority's existing airside vehicle requirements are in accord with the International Civil Aviation Organization's (ICAO) standard and recommendation. `The Authority believes that the use of flashing or rotating light is the main element in making vehicles conspicuous. In the new Manual of Standards Part 139, the Authority has included guidance on flash rate, intensity and vertical beam spread. `We also note that your Report effectively indicates that conspicuity of the sweeper was not a significant factor in this incident. To divert resources to address this issue would not seem warranted. `The Authority notes that a trial period was introduced with one vehicle painted red. The use of red is inappropriate and contrary to the ICAO standard which allocates red to emergency vehicles and yellow to service vehicles. `Thank you for bringing this matter to the attention of the Authority.'
The Authority notes that Recommendations R20020051, addressed to the United States Federal Aviation Administration (FAA), and Recommendation R20020052, addressed to the Joint Aviation Authority (JAA), are expressed in essentially the same terms as Recommendation R20020053 to CASA. As the responsible certifying authority in this instance is the FAA, CASA's view is that the FAA's response to R20020051 should adequately and appropriately address the issues of concern to the Bureau. No further action is therefore proposed at this time in regard to this fire protection loom. The Authority would appreciate receiving copies of the FAA and JAA responses as they become available.
I refer to the letter of 24 June 2003 in which a copy of the United States Federal Aviation Administration's (FAA) response to the Bureau's Recommendation 20020051 was forwarded to the Authority. The Authority notes the response by the FAA in which it concluded that `amendment of the regulation affecting fire detector systems is not appropriate'. The Authority has no further comment.
The authority's response to this Recommendation is the same as that dated 12 September 2002, to Recommendation A of the draft Report. A copy of that letter is enclosed for your information. When CASA completes its investigation and review that is referred to in that letter, CASA will advise the Bureau of the outcomes.
I refer to CASA's letter of 18 November 2002 concerning ATSB Recommendation R20020054 contained in Aviation Report 200102710 on the accident involving Embraer Banteirante VH-OZG which occurred at Cootamundra Aerodrome on 25 June 2001. The Authority gave an undertaking to investigate the fire extinguisher system installed on this type of aircraft and its location. It was indicated, also, that a review of the certification process and whether this aircraft met the requirements of Civil Aviation Order CAO 101.4 would be conducted. CASA has reviewed the regulations regarding the location of fire bottles, in particular the regulations regarding thermal aspects of fire extinguisher system installation. The review considers that existing requirements in place adequately address the correct location of fire bottles where it is required to have such systems fitted. Fire extinguisher systems, where required, are determined by the certification basis and the operational category of the aeroplane. Where a fire extinguisher system is required to be installed, such a fire extinguisher system will require that consideration be given to the location of certain components. CASA requires the correct installation of such installations be determined by FAR 25.1195, FAR 25.1197, FAR 25.1199, and FAR 25.1201, or British equivalent. Aircraft certificated to FAR 25 standard will already incorporate an appropriate system to the approved standard. For aeroplanes certificated under FAR 23, prior to amendment 34, consideration is based on CAO 101.4 that refers to FAR 25.1195, FAR 25.1197, FAR 25.1199, and FAR 25.1201, or British equivalent. With reference to VH-OZG, the aeroplane was issued with a certificate of airworthiness in the normal category. This aeroplane did not require an appropriate fire extinguisher system fitted. The fire extinguisher system fitted was not part of the certification process and was not required by the aeroplanes operational classification. The fire extinguisher system installed would not be considered appropriate for this aeroplane operating in the transport category. However certain models of the EMB 110 aeroplane do have a fire extinguisher system fitted that would be compliant with the requirements of CAO 101.4, and therefore be allowed to operate in the transport category. CASA is satisfied that the regulations currently in place, allow for the correct determination of what fire extinguisher equipment and installation of such equipment is, based on the certification basis and the operational basis of the aeroplane. The current standards provide the necessary information to determine the correct installation of fire extinguishers. Correct installation when required will prevent premature discharge of the fire retardant. A/g Executive Manager Aviation Safety Standards
ATSB Note: Airservices Australia sent an e-mail which contained a draft procedural change and detailed attachments. The Bureau was invited to make comment on the proposals
Airservices accepts this recommendation. This recommendation relates to parallel runway operations at Class D towers specifically Tamworth. Airservices Australia has been working with the Department of Defence, joint author of the Manual of Air Traffic Control, to develop appropriate procedures and then manage their implementation. On 17th of October, the group met with the ATC staff at Tamworth and local operators outlining the solution strategy and discussing implementation. Requests for change have been drafted for AIP and MATS following this input. The aim is to implement the proposed changes at the next MATS AIRAC date, ie. 17th April 2003. If you have any queries on these responses, please do not hesitate to contact me.
Resolution of this recommendation has been achieved through the publication of Tamworth specific parallel runway operations procedures, within the ATC Operations Manual Volume 2-Tamworth Tower (Local Instructions), and within the Tamworth section of AIP ERSA. These procedures are in effect however are currently published by Temporary Local Instruction (AS/05/017) and NOTAM (C21l05) pending the next available Aeronautical Information Regulation and Control (AIRAC) date.
Thank you for providing a copy of the re-issued Occurrence Brief 200105932 on the accident involving Cessna 185 floatplane Skywagon VH-JBM which occurred at Strahan, Tasmania on 29 December 2001. The Brief includes Recommendation R20020082: The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the requirement of Civil Aviation Order 20.11, with respect to wearing of life jackets, to extend the requirements to the occupants of any aircraft that is standing, taxying, taking-off, landing or approaching to land, on water. As advised in our response to the draft Occurrence Brief, including Recommendation A, on 12 August 2002, the Authority is currently reviewing the regulatory requirements for wearing lifejackets in seaplanes and helicopters conducting over-water operations, as part of the Regulatory Reform Programme. Any proposal to change the legislation governing the use of lifejackets will be put to the aviation community as part of the Notice of Proposed Rule Making (NPRM) process associated with the development of Part 121 B. CASA will consider the amendment of Civil Aviation Order (CAO) 20.11 based on the outcomes of the NPRM process. The time for submission of responses to the Discussion Papers has only recently closed.
CASA intends raising an Airworthiness Bulletin (AWB) to provide advice on how this feature may be incorporated into maintenance documentation covering periodic maintenance of barometric pressure switches in Australian registered pressurised aircraft. CASA's long-term approach will be influenced by the response of other aviation authorities to the liaison initiated by CASA as the result of Recommendation 20020109. The Civil Aviation Safety Authority issued on 01-October-2002, the following Airworthiness Bulletins (AWB): AWB 21-1 Issue "Cabin Altitude Alert Pressure Switch Maintenance Requirements." AWB 35-1 Issue 1 "Passenger Oxygen Mask Pressure Switch Maintenance Requirements" These AWB can be viewed at www.casa.gov.au/avreg/aircraft/AWB/index.htm
CASA intends raising an Airworthiness Bulletin (AWB) to provide advice on how this feature may be incorporated into maintenance documentation covering periodic maintenance of barometric pressure switches in Australian registered pressurised aircraft. CASA's long-term approach will be influenced by the response of other aviation authorities to the liaison initiated by CASA as the result of Recommendation 20020109. The Civil Aviation Safety Authority issued on 01-October-2002, the following Airworthiness Bulletins (AWB): AWB 21-1 Issue "Cabin Altitude Alert Pressure Switch Maintenance Requirements." AWB 35-1 Issue 1 "Passenger Oxygen Mask Pressure Switch Maintenance Requirements" These AWB can be viewed at www.casa.gov.au/avreg/aircraft/AWB/index.htm
The Civil Aviation safety Authority (CASA) wrote to the United States FAA, the European JAA, UK CAA and NZ CAA on 31 July 2002 inviting liaison on the safety deficiencies identified in Occurrence Brief 200200095. Questions were also asked about these authorities' views and intentions regarding periodic maintenance of barometric switches in pressurised aircraft. The following response dated 29 November 2002 was received from CASA on 03 December 2002: Thank you for providing a copy of aviation Occurrence Brief 200200095 on the incident involving Cessna 441 Conquest VH-NFD which occurred 22km north west of Perth VOR, Western Australia on 31 January 2002. In its response to the draft Brief, the Authority, in respect of Recommendations R20020101 and R20020102, stated that: CASA intends raising an Airworthiness Bulletin (AWB) to provide advice on how this feature may be incorporated into maintenance documentation covering periodic maintenance of barometric pressure switches in Australian registered pressurised aircraft. CASA's long-term approach will be influenced by the response of other aviation authorities to the liaison initiated by CASA as the result of Recommendation 20020109. The AWBs have been published as AWB 21-1 Issue I and AWB 35-1 Issue 1. Copies are enclosed for the Bureau's information. CASA also notes that the Bureau has classified each of these Recommendations as CLOSED-ACCEPTED. In respect of Recommendation R20020109, CASA advises that it has not yet received responses to its invitations - the United States Federal Aviation Administration, the United Kingdom Civil Aviation Authority and the European JAA - to the liaise on the safety deficiencies identified in the Brief. Thank you for bringing this matter to the attention of the Authority.

ATSB Response
Closed-Accepted
Closed-Accepted
Closed-Accepted
Open
Closed-Partially Accepted
Open
Monitor
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Open

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20020109	Further correspondence	3/07/2002	11/12/2002	161	Recommendation	Civil Aviation Safety Authority
R20020120	Initial Response	12/06/2002	16/08/2002	-	Recommendation	Civil Aviation Safety Authority
R20020120	Further correspondence	12/06/2002	20/03/2003	281	Recommendation	Civil Aviation Safety Authority
R20020134	Initial Response	12/12/2002	4/02/2003	-	Recommendation	Civil Aviation Safety Authority
R20020134	Further correspondence	12/12/2002	16/07/2003	-	Recommendation	Civil Aviation Safety Authority
R20020134	Further correspondence	12/12/2002	19/12/2003	-	Recommendation	Civil Aviation Safety Authority
R20020134	Further correspondence	12/12/2002	11/04/2007	1581	Recommendation	Civil Aviation Safety Authority
R20020149	Initial Response	10/07/2002	21/11/2002	-	Recommendation	Civil Aviation Safety Authority
R20020149	Further correspondence	10/07/2002	16/04/2003	280	Recommendation	Civil Aviation Safety Authority

Safety Finding
ENG - Cabin altitude alert/Passenger Oxygen deploy barometric switch maintenance
ENG - Pratt & Whitney PT6A Number One Engine Bearing Failure
ENG - Pratt & Whitney PT6A Number One Engine Bearing Failure
Rolls-Royce Allison engine fuel control unit flyweight misadjustment
Rolls-Royce Allison engine fuel control unit flyweight misadjustment
Rolls-Royce Allison engine fuel control unit flyweight misadjustment
Rolls-Royce Allison engine fuel control unit flyweight misadjustment
Rolls-Royce Allison engine fuel control unit flyweight misadjustment
Aircraft system monitoring and recording devices in small aeroplanes engaged in air transport operations.
Aircraft system monitoring and recording devices in small aeroplanes engaged in air transport operations.

Safety Issue
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority liaise with the United States Federal Aviation Administration, the United Kingdom Civil Aviation Authority and the European JAA on implementation strategies to address these safety deficiencies.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority continue to examine the circumstances of electrical discharge damage to the number-1 bearing of the Pratt and Whitney (Canada) PT6A engine models equipped with certain TRW Lucas starter-generators and develop an appropriate safety assurance strategy to ensure the continuing airworthiness of Australian registered aircraft fitted with similar engine and starter-generator combinations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority continue to examine the circumstances of electrical discharge damage to the number-1 bearing of the Pratt and Whitney (Canada) PT6A engine models equipped with certain TRW Lucas starter-generators and develop an appropriate safety assurance strategy to ensure the continuing airworthiness of Australian registered aircraft fitted with similar engine and starter-generator combinations.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority consider formalising a method to obtain and review the results of any foreign airworthiness authority audit of Australian Certificate of Approval holders.
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The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority consider formalising a method to obtain and review the results of any foreign airworthiness authority audit of Australian Certificate of Approval holders.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine whether the potential safety benefits from devices such as those that monitor and record aircraft fuel and engine system operation are sufficient to warrant them being required in general aviation aircraft used in air transport operations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine whether the potential safety benefits from devices such as those that monitor and record aircraft fuel and engine system operation are sufficient to warrant them being required in general aviation aircraft used in air transport operations.

Organisation Response
The following additional information dated 9 December 2002 was received from CASA on 11 December 2002: I am writing in relation to Recommendation R20020109 which arose from Occurrence 200200095. The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority liaise with the United States Federal Aviation Administration, the United Kingdom Civil Aviation Authority and the European JAA on the implementation strategies to address these safety deficiencies. In its responses, dated 29 August 2002 and 28 November 2002, the Authority advised the Bureau that it had written to the relevant bodies but had yet to receive a response. The Federal Aviation Administration (FAA) has recently advised that they had taken earlier action on the issues raised in the Occurrence Brief, released on29 October 2002, and it appears that they will not be taking further action. A copy of the FAA's response, for the information of the Bureau, is enclosed. CASA notes the comments at page 7 of the Occurrence Brief in relation to the United Kingdom Civil Aviation Authority. That Authority advised that "their research revealed, apart from the example cited by the ATSB that complied, the only other UK built aircraft to which these recommendations could apply was no longer the responsibility of the UK CAA". Their production had moved to the United States. Type certification responsibility now rested with the FAA. As notified earlier, CASA addressed the safety deficiencies, that were set out in Recommendations R20020101 and R20020102, through the issue of Airworthiness Bulletins AWB 21-1 and AWB 35-1. On this basis, the Authority believes that there would be no further benefit in pursuing the issue with the national bodies. The Authority considers that it has now met the requirements of Recommendation
As acknowledged in the report, the Authority has undertaken a number of actions to ameliorate the mechanical failure. These include monitoring the airworthiness of PWC PT6A engines incorporating a starter-generator that is known to require maintenance additional to that detailed in the aircraft manufacturer's maintenance schedule. In addition, CASA is liaising with the engine manufacturer on the development of an insulated starter-generator drive train, with the aim of eliminating the problem.
I refer to your note of 25 February 2003 to [CASA officer] regarding the response by the Federal Aviation Administration (FAA) to the issue of Air Safety recommendation R20020121. In addition to the information supplied by the FAA, CASA advises the following: CASA has already published a lengthy article on this subject in Flight Safety Australia. A copy of this article is attached for the information and consideration of the ATSB. CASA has also issued a CAR 38 (1) Direction to commercial operators of PT6A-60 series engines and an information letter to all other PT6A operators. Thank you for bringing the FAA's response to CASA's attention.
The Authority accepts the Recommendation and advises that the Authority will consult with the relevant foreign airworthiness authorities with a view to formalising an arrangement to obtain the results of foreign audits of Australian Certificate of Approval holders. The Authority intends writing to the United States Federal Aviation Administration, the United Kingdom Civil Aviation Authority, Transport Canada, the New Zealand Civil Aviation Authority and the Joint Aviation Authorities. The Authority undertakes to advise the ATSB of progress against this recommendation as this matter develops.
The Authority has written to the United States Federal Aviation Administration, Transport Canada, the United Kingdom Civil Aviation Authority and the New Zealand Civil Aviation Authority to initiate discussions. The discussions are aimed at establishing an arrangement or protocol between the Authority and those agencies that will enable the Authority to obtain the results of any surveillance or audits that those agencies might carry out in relation to Australian Certificate of Approval holders. The Authority intends to liaise separately with the Joint Aviation Authorities (JAA) to ascertain whether it is appropriate to initiate similar discussions at this time or to defer this until after commencement of the new European authority, the European Aviation Safety Agency (EASA). EASA is due to commence business on 28 September 2003 and will progressively take over the functions and activities of the JAA. The authority shall keep you informed of responses and outcomes in due course.
I refer to your request for additional information in support of CASA's response to Recommendation R20020134. I am advised that in July 2003, CASA wrote to a number of other foreign regulatory authorities with a view to initiating discussions aimed at establishing an arrangement or protocol between CASA and those authorities that would enable CASA to obtain the results of any surveillance or audits that those authorities might carry out in relation to Australian Certificate of Approval holders. To date, however, CASA has had little substantive response from the authorities. I understand that the New Zealand Civil Aviation Authority (NZ CAA) acknowledged the request and agreed in principle that such an arrangement might be possible, subject to more detailed consideration, but noting also resource constraints at the time. No further advice has subsequently been received. The United Kingdom Civil Aviation Authority (UK CAA) noted that the issue would cease to be applicable by the end of September 2003 when the new European Aviation Safety Agency (EASA) came into force, and recommended that we take up the issue with EASA after that date. Transport Canada and the United States Federal Aviation Administration (US FAA) have not responded formally, although an informal discussion with an FAA office indicated that the matter may be problematic and had been referred for further consideration. CASA is continuing to laise with these authorities, and with EASA now that it is established, to progress this matter. Noting that action to progress this matter rests with other Agencies as well as CASA, we will keep you informed as this matter progresses.
No further response received.
Thank you for providing a copy of Air Safety Recommendation R20020149 which related to engine/fuel monitoring and recording. Please accept my apologies for the delay in replying. Recommendation R20020149 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine whether the potential safety benefits from devices such as those that monitor and record aircraft fuel and engine system operation are sufficient to warrant them being required in general aviation aircraft used in air transport operations. The authority has examined this matter, and for the reasons set out below, does not consider that the potential safety benefits of fitting devices that monitor and record aircraft fuel and engine system operation are sufficient to warrant the costs involved in their fitment. In addition CASA's view is that the decision to mandate the installation of this equipment should be based upon a larger international analysis supporting its fitment. The ATSB has advised that the cost of these records can be modest, say $5,000 compared to approximately $100,000 for sophisticated recorders. One such low cost recorder investigated by CASA was the Data Acquisition Alarm Monitor (DAAM), manufactured by Perkins Technologies of Mentone Victoria. Perkins Technologies advised that the cost of their recorder and sensor ranges from $10,000 for a single engine piston aircraft to $20,000 for a twin engine piston aircraft. The DAAM can accommodate up to eight individual sensors. Perkins Technologies also advises that, for a turbine aircraft, an alarm only system would cost about $25,000. An alarm and trend monitoring system would cost about $35,000. This cost does not include installation costs associated with the recorder and sensors. Perkins Technologies estimate that installation would add an additional $10,000. The development of a Supplemental Type Certificate (STC) for one of these low cost recorders would take approximately 6-9 months for conformity, testing and approvals. It is estimated that this development would cost in the order of $5,000 to $10,000 for each aircraft type. These times and costs are indicative of modifications of this complexity. These modifications are usually unique to each aircraft. As CASA has shown from its research, they are expensive to develop, and expensive to install and maintain. Moreover, the benefits of low cost recorders are also limited because they: * Are not designed for aircraft use and therefore may emit undesirable radiation that can interfere with the aircraft electronics; * Are not crashworthy and may not survive a substantial crash and subsequent fire; and * Have limited capacity in terms of data channels which can be recorded, in that the data that may be important to an investigation cannot be recorded. Thank you for bringing this matter to the
I am writing in relation to the Bureau's letter of 5 December 2002 to which was attached a letter from Perkins Engineering Pty Ltd. The Bureau invited the Authority to reconsider its response, dated 21 November 2002, to Air Safety Recommendation R20020149, which also included reference to products of Perkins Engineering. Please accept my apologies for the delay in my reply. R20020149, issued on 9 July 2002, states: The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine whether the potential safety benefits from devices such as those that monitor and record aircraft fuel and engine system operation are sufficient to warrant them being required in general aviation aircraft used in air transport operations. The Authority has carefully considered the comments of the Bureau and of Perkins Engineering. The Authority acknowledges that it erred in its interpretation of the intent of the Recommendation and accepts the Bureau's view that the prime objective was to enhance real-time information about fuel and engine operation that would be available to flight crew. In addition, the Authority acknowledges that the cost obtained for a single unit of the Data Acquisition Alarm Monitor, manufactured by Perkins Engineering, may not have been representative of the true cost of installing this equipment in a large number of aeroplanes. There may be consequent economies of scale. GPO Box 2005 Canberra City ACT 2601 Telephone: (02) 6217 1619 Facsimile: (02) 6217 1444 Nothwithstanding this, the Authority is not inclined to vary its position on the fitment of the mandatory devices for the following reasons: ? It would be an Australian unique requirement not required by any other major aviation nation nor required of aircraft manufacturers; ? We are unable to estimate the number of lives saved or injuries avoided through the use of these devices even using worldwide data. Whilst it is possible to determine the number of accidents, deaths and injuries caused in the past by fuel related accidents and engine failures, it is not possible to determine how many of those would have been avoided if fuel and engine monitoring systems had been installed; I? n addition, the true cost of the mandatory installation of aviation equipment will inevitably vary from one aircraft type to another, often depending on the number of such aircraft in Australia and any consequent economies of scale. The true cost also includes the economic impact of reduction or loss of air services which could occur as a result of escalating costs of uniquely Australian requirements. The purchase price of an item of aviation equipment and its installation is only one element of the true cost that needs to be estimated; ? Operators/owners are already able to fit these devices if they consider it worthwhile. The cheaper the cost of fitment the more likely operators/owners are to pursue the enhancement. For CASA to mandate the requirement, a substantial supporting case needs to be developed and implies either CASA knows something operators/owners don't or is substituting CASA's judgement for theirs. In its letter of 21 November 2002, the Authority advised that it did not consider the potential safety benefits of fitting devices that monitor and record aircraft fuel and engine system operation are sufficient to warrant the costs involved in their fitment'. Whilst Perkins Engineering has advised the Bureau that their systems would not be as expensive as set out in the Authority's letter, this has not significantly affected the judgement we had formed. On reflection the Authority's position might be better recorded as: "CASA does not consider the potential safety benefits of fitting devices that monitor and record aircraft fuel and engine system operation are sufficient to warrant their fitment being made mandatory." This construct does not imply any concerns with operators/owners voluntarily

ATSB Response
Closed-Accepted
Monitor
Closed-Accepted
Monitor
Monitor
Monitor
Closed-Not Accepted
Monitor
Closed-Not Accepted
Open
Closed-Not Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20020168	Initial Response	20/09/2002	4/02/2003	-	Recommendation	AirServices Australia
R20020168	Further correspondence	20/09/2002	16/04/2004	574	Recommendation	AirServices Australia
R20020169	Initial Response	20/09/2002	4/02/2003	137	Recommendation	AirServices Australia
R20020170	Initial Response	20/09/2002	4/02/2003	-	Recommendation	AirServices Australia
R20020170	Further correspondence	20/09/2002	16/04/2004	574	Recommendation	AirServices Australia
R20020171	Initial Response	20/09/2002	16/04/2003	-	Recommendation	AirServices Australia
R20020171	Further correspondence	20/09/2002	16/04/2003	208	Recommendation	AirServices Australia
R20020172	Initial Response	20/09/2002	4/02/2003	137	Recommendation	AirServices Australia
R20020173	Initial Response	20/09/2002	26/04/2003	218	Recommendation	Civil Aviation Safety Authority
R20020174	Initial Response	20/09/2002	26/03/2003	187	Recommendation	Civil Aviation Safety Authority
R20020175	Initial Response	20/09/2002	26/03/2003	187	Recommendation	Civil Aviation Safety Authority
R20020177	Initial Response	20/09/2002	26/03/2003	187	Recommendation	Civil Aviation Safety Authority
R20020178	Initial Response	20/09/2002	26/03/2003	187	Recommendation	Civil Aviation Safety Authority
R20020179	Initial Response	20/09/2002	26/03/2003	187	Recommendation	Civil Aviation Safety Authority
R20020186	Initial Response	20/09/2002	4/02/2003	137	Recommendation	AirServices Australia
R20020193	Initial Response	23/10/2002	13/12/2002	51	Recommendation	Civil Aviation Safety Authority
R20020194	Initial Response	23/10/2002	13/12/2002	51	Recommendation	Civil Aviation Safety Authority
R20020205	Initial Response	23/10/2002	13/12/2002	51	Recommendation	Civil Aviation Safety Authority
R20020243	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020243	Further correspondence	15/11/2002	31/10/2006	1446	Recommendation	Civil Aviation Safety Authority

Safety Finding
OPS/ATS/HP - Adverse effects of flight through convective weather
OPS/ATS/HP - Adverse effects of flight through convective weather
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OPS/ATS/HP - Adverse effects of flight through convective weather
OPS/ATS/HP - Adverse effects of flight through convective weather
OPS/ATS/HP - Adverse effects of flight through convective weather
OPS - Night VFR operations in dark night conditions
OPS - Chief pilot competencies in management and systems safety
OPS - Availability of fixed fuel reserve
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.

Safety Issue
The Australian Transport Safety Bureau recommends that Airservices Australia review air traffic controller initial and periodic recurrent training programs to ensure they adequately address the effect of convective weather on aircraft performance and the limitations of airborne weather radar
The Australian Transport Safety Bureau recommends that Airservices Australia review air traffic controller initial and periodic recurrent training programs to ensure they adequately address the effect of convective weather on aircraft performance and the limitations of airborne weather radar
The Australian Transport Safety Bureau recommends that Airservices Australia expedite the development of an integrated weather radar/air traffic control radar video display system capable of providing multiple weather echo intensity discrimination without degradation of air traffic control radar information.
The Australian Transport Safety Bureau recommends that Airservices Australia increase the emphasis in its controller training programs to ensure that all appropriate sources of weather information, such as meteorological forecasts, controller observations, radar information, and pilot reports are provided to flight crews.
The Australian Transport Safety Bureau recommends that Airservices Australia increase the emphasis in its controller training programs to ensure that all appropriate sources of weather information, such as meteorological forecasts, controller observations, radar information, and pilot reports are provided to flight crews.
The Australian Transport Safety Bureau recommends that Airservices Australia develop a comprehensive convective weather refresher course as part of recurring training for all personnel actively engaged in the control of air traffic.
The Australian Transport Safety Bureau recommends that Airservices Australia develop a comprehensive convective weather refresher course as part of recurring training for all personnel actively engaged in the control of air traffic.
The Australian Transport Safety Bureau recommends that Airservices Australia in conjunction with the Civil Aviation Safety Authority and the Bureau of Meteorology develop a standard scale of thunderstorm intensity for use within the aviation industry.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority in conjunction with the Bureau of Meteorology and Airservices Australia develop a standard scale of thunderstorm intensity for use within the aviation industry.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority in conjunction with the Bureau of Meteorology review the meteorology syllabus for initial and periodic recurrent training of pilots and air traffic controllers to ensure that the syllabus includes comprehensive information on convective weather phenomena and its effects on aircraft performance.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that operators increase the emphasis in their initial and periodic recurrent training programs on the effective use of all available sources of weather information, such as pre-flight meteorological briefings, ATIS broadcasts, controller-provided reports, airborne weather radar, and visual observations, and provide detailed guidance to pilots regarding the degradation on aircraft performance during flight through intense convective weather, and operational decisions involving takeoff and landing operations which could expose a flight to hazardous weather conditions.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority place greater emphasis on the hazards of low-level flight through thunderstorms and on the effect of windshear encounter during initial and periodic recurrent training programs for all pilots.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority coordinate the activities of the Civil Aviation Safety Authority, Airservices Australia and the Bureau of Meteorology in respect of implementation of the recommendations arising from ATSB report BO/200100213.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that operators of aircraft equipped with weather radar provide pilots with initial and periodic recurrent training on the use and interpretation of weather radar, and its limitations.
The Australian Transport Safety Bureau recommends that Airservices Australia in conjunction with the Bureau of Meteorology develop a position in major air traffic control locations, to be staffed with Bureau of Meteorology meteorologists, to be the focal point for weather information coordination.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the general operational requirements, training requirements, flight planning requirements and guidance material provided to pilots conducting VFR operations in dark
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the required qualifications and/or competencies for chief pilots, with particular reference to management and system safety issues.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the provisions for planning a fixed fuel reserve and determine if this fuel should be contained in the fuel tanks that are to be used during the approach and landing.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the effectiveness of the system for the transmission of information on faults, malfunctions and defects to the organisation responsible for the aircraft's type design, in accordance with ICAO Annex 8, Part II, paragraph 4.2.5.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the effectiveness of the system for the transmission of information on faults, malfunctions and defects to the organisation responsible for the aircraft's type design, in accordance with ICAO Annex 8, Part II, paragraph 4.2.5.

Organisation Response
The following response dated 29 January 2003 was received from Airservices Australia: Airservices Australia accepts this recommendation. A review of ATC training material is to be undertaken by ATC Capability Branch (ATCC) to determine the veracity of the current training programs in regard to this recommendation.
The following response dated 13 April 2004 was received from Airservices Australia: A training package has been developed which is used in ab-initio course and is also included as a topic available for refresher training.
The following response dated 29 January 2003 was received from Airservices Australia: Recent trials of integrated weather radar/air traffic control radar video in TAAATS have revealed limitations in present equipment capabilities and raised significant HMI issues. At this point, given the current weather display facilities available to ATC, any advantage to the aviation industry is outweighed by the HMI concerns, the technical difficulties and the estimated high cost of implementation. Unless it can be clearly demonstrated that such a facility would produce tangible benefits to the industry it is not intended to pursue the matter in the short to medium term. A further response dated 7 August 2003 was received from Airservices Australia: In relation to recommendation R20020169, recent trials of integrated weather radar/air traffic control radar video in the TAAATS have revealed limitations in equipment capabilities and raised significant HMI issues. Given the weather displays facilities already available to ATC, any advantage in introducing integrated displays is far outweighed by the HMI concerns, the technical difficulties and the high cost of implementation. Unless it can be demonstrated that the facility would clearly benefit the industry it is not intended to pursue the matter in the medium term. Further action
The following response dated 29 January 2003 was received from Airservices Australia: It is believed that current procedures already adequately cover the issues identified in the recommendation, however a Review of controller weather training will be undertaken by ATCC and upgrade action taken as required.
The following response dated 13 April 2004 was received from Airservices Australia: This recommendation has been addressed in the refresher training module referenced above (developed in response to R20020168).
The following response dated 29 January 2003 was received from Airservices Australia: Airservices Australia will develop an enhanced refresher training module.
The following response dated 13 April 2004 was received from Airservices Australia: This recommendation has been addressed in the refresher training module referenced above (developed in response to R20020168).
Airservices Australia supports the BoM argument against the recommendation, namely: "In some countries a single scale of thunderstorm intensity is used in severe weather warnings to the general public. There is no agreement currently, however, that it is appropriate to use such a scale in aviation forecasts and warnings. There is good reason for the reluctance to introduce such a scale. Among of the most significant hazards for aviation associated with thunderstorms are microbursts. There is, however, no correlation between microburst intensity and the intensity of the thunderstorm with which it is associated. An intense microburst may develop from a weak storm and there may only be a weak down draft from an intense thunderstorm. Ascribing an intensity scale to a thunderstorm would not only not convey any useful information to the aviation community, but could even be counterproductive in the sense that it could lead pilots to believe that there is less danger in flying into a thunderstorm that has a low intensity than one with a high intensity, when this is not the case. It should be noted also that existing aviation forecasts, the Terminal Aerodrome Forecasts and Trend Type Forecasts, already allow for a description of the expected severity of the individual elements of a thunderstorm - the strength of wind gusts, the intensity of rain, the presence of hail etc, and the associated reductions in cloud ceiling and visibility."
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: Although the Authority acknowledges the intent of this recommendation, the Authority believes that the Bureau of Meteorology (BoM) is the agency currently responsible for the standards of aviation meteorology. The lead in changing such standards rests with the BoM but the Authority would be pleased to cooperate in a project to develop a standards scale of describing thunderstorm activity. However, the Authority's view is that grading of thunderstorms would further obfuscate the matter, as all thunderstorms are 'bad" and should be avoided. Grading of thunderstorms merely provides criteria to permit flight through some thunderstorms and mandatory avoidance of others.
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: The Authority acknowledges the intent of this recommendation but believes that the BoM currently sets the syllabus for meteorological raining for pilots and air traffic controllers. However, the Authority would be pleased to participate with other agencies should this task be undertaken.
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: CASA acknowledges the intent of this recommendation and advises that while this is normal practice within the industry, the Authority will consider including an article on this topic in a future edition of the Flight Safety Australia magazine. CASA advised 25 March 2004 that an article would be included in the May-June issue of Flight Safety.
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: The Authority acknowledges the intent of recommendations R20020175 and R20020177. It addresses the matters raised in these recommendations through its education programs. A meteorological module is included in the Authority's programs. For example, a module called WeatherWise is included in the Flight Safety Roadshows. It covers a wide range of adverse weather situations including thunderstorms and microbursts and emphasises the importance of pre-flight weather briefings.
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: The Authority does not agree with this recommendation. It is neither the authority for setting of aviation weather standards nor for developing training syllabi. It is considered that the BoM should take carriage for the implementation of these recommendations.
The following response dated 22 March 2003 was received from the Civil Aviation Safety Authority: CASA acknowledges the intent of this recommendation and advises that while this is normal practice within the industry, the Authority will consider including an article on this topic in a future edition of the Flight Safety Australia magazine. CASA advised 25 March 2004 that an article would be included in the May-June issue of Flight Safety.
The following response dated 29 January 2003 was received from Airservices Australia: Airservices Australia agrees in principle with the recommendation but issues of roles and responsibilities and cost recovery require definition and resolution. A response dated 7 August 2003 was received from Airservices Australia: In relation to recommendation R20020186, Airservices Australia believes that no quantitative or qualitative evidence has been provided to support the creation of the proposed staff position. As a result the recommendation is not supported. A further response dated 13 April 2004 was received from Airservices Australia: Airservices Australia believes that there was no evidence to support the creation of such a position. The recommendation was therefore not supported and no further action has been taken.
CASA acknowledges the intent of this Recommendation. As part of the proposed CASR Part 61, CASA is developing the requirements for night VFR ratings which will be based on the existing Civil Aviation Order CAO 40.2.2. In addition, a draft competency standard for
CASA acknowledges the intent of this Recommendation. It is intended, under the proposed CASR Part 119 to introduce a Safety Management System, among other issues, for air transport operators. Essentially these proposals provide for training and checking for crews flying with small operators and a greater regulatory emphasis on the responsibilities of key personnel in a company, including the head of flying operations.
CASA does not agree with this Recommendation as it considers that there is sufficient guidance on fuel management currently available. A rule, stipulating in which tank fuel should be located, would be overly prescriptive. CASA is in the process of developing new General Operating and Flight Rules (GOFR) which will be contained in proposed CASR Part 91. CASA published Notice of Proposed Rule Making NPRM 0101OS on 17 September 2001 which relates to GOFR. The NPRM included a draft Rule 91.375 which states: "(1) Before an aircraft commences a flight, the pilot in command of the aircraft must plan the flight in such a way as to ensure that enough fuel will remain in the aircraft's tanks after landing to allow it to fly for at least 30 minutes (or for rotorcraft, 20 minutes) at normal cruise power under ISA conditions at 1500 feet above the place of intended arrival". In responses to the NPRM, no person commented that the rules should go beyond this and stipulate which tanks should contain the fuel on landing. Civil Aviation Advisory Publication CAAP 234-1(0) provides advice on fuel management. In addition, operators are required to detail in their Operations Manuals how fuel will be managed during flight.
The Authority supports this Recommendation. The Recommendation is being implemented through the introduction of a database of Type Certificate Holders and manufacturers that will link to the Authority's Service Difficulty Report (SDR) system. Work has commenced on this project and is planned to be completed in August 2003.
In October 2006, CASA issued Notice of Proposed Rule Making NPRM 0604MS, A Proposal to Modernise and Harmonise Rules for the Maintenance of Australian Aircraft and Licensing of Aircraft Maintenance Personnel for industry comment by 27 November 2006. The NPRM addresses the policy outcomes of adopting a regulatory style similar to that proven by the European Aviation Safety Agency (EASA) and would amend Parts 42, 66, 145 and 147 of the Civil Aviation Safety Regulations 1998 (CASRs). ATSB Response: The NPRM, as proposed, should address the issue in the recommendation

ATSB Response
Open
Closed-Accepted
Closed-Partially Accepted
Open
Closed-Accepted
Open
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Closed-Partially Accepted
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Closed-Accepted
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Monitor
Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20020244	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020244	Further correspondence	15/11/2002	13/04/2004	515	Recommendation	Civil Aviation Safety Authority
R20020245	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020245	Further correspondence	15/11/2002	19/03/2008	1951	Recommendation	Civil Aviation Safety Authority
R20020246	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020246	Further correspondence	15/11/2002	31/10/2006	1446	Recommendation	Civil Aviation Safety Authority
R20020247	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020247	Further correspondence	15/11/2002	31/10/2006	1446	Recommendation	Civil Aviation Safety Authority
R20020248	Initial Response	15/11/2002	30/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20020248	Further correspondence	15/11/2002	19/03/2008	1951	Recommendation	Civil Aviation Safety Authority
R20030010	Initial Response	26/02/2004	10/03/2004	13	Recommendation	Civil Aviation Safety Authority
R20030014	Initial Response	26/02/2004	10/03/2004	13	Recommendation	Civil Aviation Safety Authority
R20030018	Initial Response	26/02/2004	23/03/2004	26	Recommendation	Civil Aviation Safety Authority
R20030027	Initial Response	26/02/2003	8/01/2003	-	Recommendation	Civil Aviation Safety Authority
R20030027	Further correspondence	26/02/2003	10/01/2005	-	Recommendation	Civil Aviation Safety Authority
R20030027	Further correspondence	26/02/2003	1/06/2006	1191	Recommendation	Civil Aviation Safety Authority
R20030056	Initial Response	4/08/2003	1/02/2005	547	Recommendation	AirServices Australia
R20030057	Initial Response	4/08/2003	1/02/2005	-	Recommendation	AirServices Australia

Safety Finding
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
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Grounding of Boeing 767 aircraft VH-RMD/E/F/G/H/K/L on 22 December 2000 due to the omission of required structural inspections.
OPS - Saab 340 Checklists
ENG - Saab 340 Electrical System Certification
ENG - Saab 340 Electrical System Certification
Airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive
Airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive
Airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive
Use of non-standard levels
Use of non-standard levels

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review relevant Australian civil aviation legislation and regulations to ensure that operators of Class A aircraft are required to have an acceptable system for receiving, assessing and actioning safety-related service documentation, in accordance with ICAO Annex 6, Part I, paragraph 8.5.2.
assessing and actioning safety-related service documentation, in accordance with ICAO Annex 6, Part I, paragraph 8.5.2.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority develop and issue clear guidance material for, and review its surveillance of, Australian operators of Class A aircraft in relation to: * continuing airworthiness assurance activities, including the major defect reporting system * knowledge of mandatory continuing airworthiness requirements under Australian civil aviation legislation * the transmission of information to the organisation responsible for the type design * the receipt, assessing and actioning of safety-related service documentation.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority develop and issue clear guidance material for, and review its surveillance of, Australian operators of Class A aircraft in relation to: * continuing airworthiness assurance
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, as a part of its oversight role, review the policies and procedures for carrying out, and responding to the findings of, risk assessments of organisations that operate Class A aircraft. The review should address the adequacy of methods for: * gathering and assessing information relevant to possible risks to safe operations * determining, carrying out, and reviewing the CASA response to the assessed level of risk.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, as a part of its oversight role, review the policies and procedures for carrying out, and responding to the findings of, risk assessments of organisations that operate Class A aircraft. The review should address the adequacy of methods for: * gathering and assessing information relevant to possible risks to safe operations * determining, carrying out, and reviewing the CASA response to the assessed level of risk.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the structure and procedures of the major defect reporting system to ensure that: * all relevant defect information is received from operators in a timely manner * defect information received is monitored, processed, and analysed * defect information and information derived from subsequent investigations is disseminated to all relevant parties and made publicly available.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the structure and procedures of the major defect reporting system to ensure that: * all relevant defect information is received from operators in a timely manner * defect information received is monitored, processed, and analysed * defect information and information derived from subsequent investigations is disseminated to all relevant parties and made publicly available.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider the introduction of a periodic Certification Maintenance Review requirement for Australian Class A aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider the introduction of a periodic Certification Maintenance Review requirement for Australian Class A aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider the introduction of a periodic Certification Maintenance Review requirement for Australian Class A aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their existing approvals of the Saab 340 abnormal and emergency checklists, with reference to current human factors research findings on the design and use of aircraft checklists.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the safety benefit of mandating Saab Aircraft AB Service Bulletin 340-24-026 incorporating generator control unit modification number 2533.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their existing approvals of Saab 340 systems of maintenance to ensure continued consistency with maintenance review board report requirements for the Saab 340.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the inspection procedures with regard to the continuing airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the inspection procedures with regard to the continuing airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the inspection procedures with regard to the continuing airworthiness of wooden wings and propellers that were manufactured with the use of Casein adhesive.
The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to determine why flight crews were able to submit flight plans and operate on non-standard routes in contravention of the AIP, which required crews to plan on routes provided to the air traffic control system by the publication of air route specifications.
The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to establish the extent of the use of non-standard levels in situations initiated by pilots and in situations initiated by controllers.

Organisation Response
The Authority acknowledges the intent of this Recommendation. It is anticipated that the suite of Maintenance Regulations, planned to be introduced in mid-2003, will provide this outcome. Notices of Proposed Rule Making for these Regulations were released for public comment in January 2002. Responses are being considered.
On 13 April 2004, CASA commenced Project CS 04/03 - Review/Amend CASR Parts 21-35 Airworthiness Standards. CASR Part 25 relates to aeroplanes in the transport category.
The Authority acknowledges the intent of this Recommendation. The current advisory material set out in Civil Aviation advisory publication, CAAP 51-1, along with that proposed in the new suite of Maintenance Regulations, provide for this. A copy of CAAP 51-1 is enclosed for your information.
The ATSB will continue to monitor the implementation of CASA's proposed safety action. Based on the previous advice and the ongoing work to change the regulations the ATSB reclassifies the recommendation as Closed-Accepted (20 March 2008).
The Authority acknowledges the intent of this Recommendation. The Authority's audit surveillance of operators currently comprises regular, scheduled audits that are supported by targeted risk-based audits. A Safety Trend Indicator (STI) was introduced in 1999-2000. It allows the Authority to determine, in a consistent manner, the higher likelihood of safety problems occurring with an aviation organisation. This is one factor that allows the Authority to decide which operators should be subject to extra, or risk-based, surveillance. A STI is conducted every six months and after a surveillance audit and, in developing the STI, the Authority took into account international practice. STI is a valuable tool for providing safety trend information on particular risk issues affecting particular sectors of the industry at particular locations. The Australian National Audit Office, in its report, Aviation Safety Compliance Follow-up Audit - Civil Aviation Safety Authority (2002), commented favourably on the approach. The Authority is currently developing an enhanced version of STI which will capture more data and enhance the Authority's comparative risk analysis capability. The intention is to monitor each component of an airline's operations so that it can focus its audits on the component(s) of an airline that pose the greatest
In October 2006, CASA issued Notice of Proposed Rule Making NPRM 0604MS, A Proposal to Modernise and Harmonise Rules for the Maintenance of Australian Aircraft and Licensing of Aircraft Maintenance Personnel for industry comment by 27 November 2006. The NPRM addresses the policy outcomes of adopting a regulatory style similar to that proven by the European Aviation Safety Agency (EASA) and would amend Parts 42, 66, 145 and 147 of the Civil Aviation Safety Regulations 1998 (CASRs). ATSB Response: The NPRM, as proposed, should address the issue in the recommendation
The Authority acknowledges the intent of this Recommendation. It has taken a number of steps to address past problems and is implementing procedures to make the Major Defect Reporting (MDR) system, now known as SDR, more effective and efficient. As the Bureau is aware, in 2002 the Authority commissioned an independent consultant to conduct a safety assurance review on the backlog of Service Difficulty Reports. The aim was to review the backlog of MDRs and, inter alia, identify and leave open all MDRs which included possible critical safety-of-flight issues. A further beneficial outcome of the project is that a substantial compendium of safety data is available which will be invaluable in future investigations. As a consequence of this review, the Authority has implemented a number of significant measures that address the points raised in the Recommendation. To ensure that SDRs are actioned in a timely manner, the Authority: * requires monthly reports on outstanding SDRs to be provided for the information of the Executive; * provides regular reports for consideration by the CASA Executive through the Executive Operations Committee; * has established procedures to ensure that Principal Maintenance Specialists review all incoming SDRs and allocate them to relevant Technical Specialists; * has trained Principal Maintenance Specialists and Technical Specialists in associated information systems; * is implementing more effective consultation mechanisms for regional and central office staff; and * is developing a SDR Workflow Management System, including new information technology applications, which will result in appropriate workflow management and the timely actioning of SDRs.
In October 2006, CASA issued Notice of Proposed Rule Making NPRM 0604MS, A Proposal to Modernise and Harmonise Rules for the Maintenance of Australian Aircraft and Licensing of Aircraft Maintenance Personnel for industry comment by 27 November 2006. The NPRM addresses the policy outcomes of adopting a regulatory style similar to that proven by the European Aviation Safety Agency (EASA) and would amend Parts 42, 66, 145 and 147 of the Civil Aviation Safety Regulations 1998 (CASRs). ATSB Response: The NPRM, as proposed, should address the issue in the recommendation
The Authority agrees with this Recommendation and notes that this requirement is incorporated in the new suite of Maintenance Regulations, anticipated to be introduced in mid-2003.
Based on the previous advice and the ongoing work to change the regulations the ATSB reclassifies the recommendation as Closed-Accepted (20 March 2008).
In addition to the information provided to the Bureau on 23 January 2004, I am advised that in accordance with Civil Aviation Regulation (CAR) 232, an operator is required to use an approved checklist, which sets out the procedures to be followed by the Pilot in Command (PIC) and other flight crew members prior to and on take-off, in flight, on landing and in emergency situations. However, there is currently no requirement for human factors to be considered when approving aircraft checklists. Checklists are more often than not derived from manufacturers recommended checklists and then modified to incorporate other requirements that are found to be particular to the Australian environment. Although there is currently no requirement for human factors to be considered when approving aircraft checklists, I am advised that training in both Human Factors and Crew Resource Management (CRM) will be addressed with the introduction of Civil Aviation Safety Regulation (CASR) Part 121A in 2005. CASR 121A will require flight and cabin crewmembers to be subject to more comprehensive training and checking requirements, particularly in the application [of] human factors and CRM concepts in training and assessment well beyond the production of flight check systems. CASA believes that the Bureau's recommendation will be met with the introduction of CASR Part 121A, which will apply these principles to all air transport operations in aircraft above 5700 kg maximum takeoff weight (MTOW). Furthermore, as a result of the Bureau's recommendation, CASA's Airline Operations Area will include in their annual surveillance plan for the 2004/05 planning year, an audit of the suitability of design and use of flight deck checklists.
CASA has assessed the safety benefit of mandating SAAB Service Bulletin 340-24-026 and can see no case for mandating modification 2533, which is essentially a product improvement. The original issue of the Service Bulletin was given "recommended" status by the manufacturer. However, when the Bulletin was revised in October 2001, the status was downgraded to "optional". Therefore, given the downgrading of the manufacturer's status and the fact that this is a product improvement, CASA can see no safety benefit in mandating this Bulletin.
The following response dated 22 March 2004 was received from the Civil Aviation Safety Authority: As a result of the ATSB report, CASA will review existing approvals of Saab 340 systems of maintenance to ensure continued consistency with maintenance review board requirements for the Saab 340. Please note that there may only be one operator involved in this review.
The Civil Aviation Safety Authority advised that it will review the existing regulations and advisory material related to the continuing airworthiness of old wooden aircraft, including the use of casein adhesives. The Authority will advise the Bureau of the outcomes of
I refer to your email of 9 December 2004 seeking an update on recommendation R20030027, which was issued to the Civil Aviation Safety Authority (CASA) in February 2003. In an earlier response, CASA advised the Bureau that it would review the existing regulations and advisory material related to the continuing airworthiness of old wooden aircraft, including the use of casein adhesives. Due to resourcing constraints, CASA has been unable to initiate a review of the existing regulations and advisory material, which essentially relates to older Tiger Moths and similar aircraft types that are generally used for either private flying or adventure type operations. CASA's Aviation Safety Standards Division anticipates that a review on this issue will be completed in the first half of 2005.
The Civil Aviation Safety Authority (CASA) issued an Airworthiness Bulletin 02-011 dealing with subject of Timber, Plywood and Adhesive for Aircraft Use on 26 October 2005.
Airservices Australia is considering the impact of introducing the following flight planning requirement into AIP: "A field 18 entry identifying the routing non compliance is required whenever flight plan details are filed between city pairs contrary to AIP requirements".
An internal hazard identification workshop was undertaken using pilots and controllers to review the extent of hazards associated with the assignment of non standard levels. The workshop report is attached for your review. The review determined that to not have the flexibility to use non-standard levels would significantly increase the number of level changes and thereby increase the level of risk beyond the current level. As can be seen from the report a number of recommendations were made to assure that the extent and operation of the use of non-standard levels was optimised.

ATSB Response
Monitor
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Monitor
Closed-Accepted
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Closed-Partially Accepted
Closed-Not Accepted
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Closed-Not Accepted
Monitor

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20030057	Further correspondence	4/08/2003	28/04/2005	633	Recommendation	AirServices Australia
R20030058	Initial Response	4/08/2003	20/10/2003	77	Recommendation	Civil Aviation Safety Authority
R20030182	Initial Response	20/01/2004	25/02/2004	36	Recommendation	Civil Aviation Safety Authority
R20030211	Initial Response	6/11/2003	22/12/2003	46	Recommendation	Civil Aviation Safety Authority
R20030213	Initial Response	6/11/2003	10/12/2003	-	Recommendation	Civil Aviation Safety Authority
R20030213	Further correspondence	6/11/2003	21/12/2004	-	Recommendation	Civil Aviation Safety Authority
R20030213	Further correspondence	6/11/2003	27/01/2005	448	Recommendation	Civil Aviation Safety Authority
R20030219	Initial Response	16/12/2003	6/02/2004	-	Recommendation	Civil Aviation Safety Authority
R20030219	Further correspondence	16/12/2003	15/10/2007	1399	Recommendation	Civil Aviation Safety Authority

Safety Finding
Use of non-standard levels
Use of non-standard levels
Saab 340 nil stall warning in icing conditions
ENG - R22 Clutch Shaft Assembly Procedures
OPS - Visual Operations at Night
OPS - Visual Operations at Night
OPS - Visual Operations at Night
Safety Concerns With Helicopter Water-Bombing Operations
Safety Concerns With Helicopter Water-Bombing Operations

Safety Issue
The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to establish the extent of the use of non-standard levels in situations initiated by pilots and in situations initiated by controllers.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the Table of Cruising Levels in AIP and its continuing relevance.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine the circumstances surrounding this incident where Saab 340 aircraft can stall without warning in icing conditions and take appropriate action to ensure the safety of the Saab 340 fleet operating within Australia.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority mandate a one-off inspection of the Australian R22 fleet and if considered necessary, the R44 fleet to: a) inspect the A166 clutch shaft for evidence of fretting where it mates with the A907 yoke, and; b) inspect the shaft to yoke attachment bolt holes for fretting cracking or other wear, and; c) identify and remove paint from beneath the yoke assembly bearing block plate, and; d) identify and remove from service any instances of a non-approved mating compound on the A166 shaft to A907 yoke for the R22 fleet and the C166 shaft to C907 yoke for the R44 fleet.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the night visual flight requirements and promulgate information to pilots emphasising the importance, during flight planning, of considering whether: * environmental conditions allow for aircraft orientation by visual reference alone; * there is likely to be sufficient ground or natural lighting and flight visibility along the proposed route to provide visual reference to the ground and/or water during the flight; and * they are capable of safely operating the aircraft should non-visual conditions be encountered.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the night visual flight requirements and promulgate information to pilots emphasising the importance, during flight planning, of considering whether: * environmental conditions allow for aircraft orientation by visual reference alone; * there is likely to be sufficient ground or natural lighting and flight visibility along the proposed route to provide visual reference to the ground and/or water during the flight; and * they are capable of safely operating the aircraft should non-visual conditions be encountered.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the night visual flight requirements and promulgate information to pilots emphasising the importance, during flight planning, of considering whether: * environmental conditions allow for aircraft orientation by visual reference alone; * there is likely to be sufficient ground or natural lighting and flight visibility along the proposed route to provide visual reference to the ground and/or water during the flight; and * they are capable of safely operating the aircraft should non-visual conditions be encountered.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, highlight the safety benefits to helicopter pilots and crew of the wearing of personal protective equipment, such as helmets and personal flotation devices when carrying out water-bombing in support of fire fighting operations, through safety promotion initiatives.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, highlight the safety benefits to helicopter pilots and crew of the wearing of personal protective equipment, such as helmets and personal flotation devices when carrying out water-bombing in support of fire fighting operations, through safety promotion initiatives.

Organisation Response
Firstly, let me apologise for the very late response to this recommendation. Unfortunately the recommendation did not get processed in accordance with our usual management practices. The text of this recommendation was as follows: "The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to establish the extent of the use of non-standard levels in situations initiated by pilots and in situations initiated by controllers". A workshop on the application of non-standard levels was conducted in December 2003 with industry consultation occurring through 2004. The workshop and industry consultation did not determine with any accuracy the extent of use of non-standard levels. Review within Airservices Australia equally has not been able to definitely determine a quantitative figure on their utilisation. Their use varies within the year with factors such as jet stream effects. Documentation within MATS and AIP limit the circumstances within which ATC can initiate the use of non-standard levels (see below). Airservices Australia believes that these are appropriate, and our Check and Standardisation regime confirms that these are being utilised by ATC: AIP ENR 1.7 -- 6 3. CRUISING LEVELS 3.1 Selection of Levels 3.1.1 Flights must be planned in accordance with levels selected from the tables at Section 5. Any part of a flight that will take place south of 45?S must be planned in accordance with levels selected from the tables at Section 6. 3.1.2 Within controlled airspace, ATC may assign and pilots may request a level that does not accord with the tables in Section 5. MATS Assigning levels 6.1.2.5 Level assignment shall take into account: a. separation; b. terrain clearance; c. provision for radio failure; d priority. 6.1.2.6 When practicable, the pilot requested level should be accommodated. 6.1.2.7 When adjustment of a level is necessary for entry to, or leaving controlled airspace, the adjustment should be made within controlled airspace. 6.1.2.8 Cruising levels conforming to the appropriate table of cruising levels (See "Tables of Cruising Levels" Annex 4-8) should be assigned as necessary to provide separation between aircraft. Levels not conforming to these tables may be assigned when traffic or other circumstances require. 6.1.2.9 Unless coordination is effected, aircraft entering airspace where RVSM is not applied shall be assigned a level complying with the accepting sector's table of cruising levels before the sector boundary, or by the time or distance specified by the accepting sector. Non standard levels 6.1.2.10 When a non standard level is assigned, controllers should consider: a. workload implications; b. coordination implications; c. the effect on other aircraft at standard levels. Priority for level assignment 6.1.2.11 Level assignment shall generally be determined as follows: a. aircraft at standard flight levels shall be afforded priority over aircraft at nonstandard flight levels; b. aircraft assigned a level shall have priority over aircraft requesting that level; c. when two or more aircraft are at the same level, the preceding aircraft shall have priority. Variation to standard assignable levels 6.1.2.12 Where standard assignable levels have been implemented for arriving and departing aircraft, assignment of other than agreed levels must be subject to specific coordination. Aircraft at non-standard cruising levels 6.1.2.13 Aircraft operating at other than a level conforming to the table of cruising levels for the particular direction of flight or notifying intention to cruise at such a level, shall be advised accordingly and the pilots intentions sought. I would also note that the workshop determined
Thank you for providing the Authority with a copy of Aviation Occurrence Brief 200203094 on the incident involving a Boeing 737 aircraft registered VH-TJT and a Cessna 500 Citation aircraft registered VH-HKX, which occurred at 324km NNE Melbourne VOR on 8 July 2002. The Authority has considered the Brief and provides the following comments in response to the recommendation below. R20030058 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the Table of Cruising Levels in AIP and its continuing relevance. CASA response The Table of Cruising Levels in AIP gives flight levels for aircraft to be flown depending upon their direction of flight and is intended to ensure that aircraft going in different directions are not at the same level during cruise. It applies to aircraft in controlled airspace (although ATC can override it for aircraft under their control) and outside controlled airspace (where aircraft arrange separation between themselves without ATC involvement). In CASA's opinion, the table was not pertinent to the breakdown of vertical separation in this case because ATC, by authorising non-standard levels, did not adhere to it. However, the Authority does consider the table to be relevant to aircraft operations in a broader sense. Thank you for
CASA will observe any developments by the aircraft manufacturer or other aviation regulatory authorities towards mandatory modification of Saab 340 aircraft to provide enhanced stall warning in icing conditions. The Authority understands that Transport Canada requires enhanced stall warning in Saab 340 aircraft registered in Canada. However, CASA is not aware of any Service Bulletin or similar document offering this enhanced stall warning system for general availability. In order to ensure that Saab 340 aircraft operators are aware of circumstances surrounding the incident, the Authority's airline offices will write to their Saab 340 operators advising that they review the Bureau's report and note the recommendations. CASA is satisfied that both Rex and Hazelton have taken appropriate measures to address the deficiencies identified in the 'Local Safety Actions' at Section 4.2 of the report. For the information of the Bureau, CASA will determine if the specific issues identified in 'Local Safety Actions' have been applied by Macair during its next audit of the operator. In addition, CASA plans to publish a series of articles on icing related issues in a future edition of Flight Safety Australia.
I refer to your letter dated 6 November 2003 regarding the release of Air Safety Recommendation R20030211 involving Robinson Helicopter Company R22 pre--impact failure of the clutch shaft. R20030211: The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority mandate a one-off inspection of the Australian R22 fleet and if considered necessary, the R44 fleet to: a) inspect the A166 clutch shaft for evidence of fretting where it mates with the A907 yoke, and b) inspect the shaft to yoke attachment bolt holes for fretting cracking or other wear, and; c) identify and remove paint beneath the yoke assembly bearing block plate, and d) identity and remove from service any instances of non-approved mating compound on the A166 shaft to the A907 yoke fro [sic] the R22 fleet and the C166 shaft to C908 yoke for the R44 fleet. In response to the release of the Recommendation, the Civil Aviation Safety Authority advises the following: CASA has issued two Airworthiness Directives (copies attached) in response to the matters raised by the Australian Transport Safety Bureau. The Airworthiness Directives require the inspection of the main rotor yoke and clutch shaft joint for evidence of fretting, cracking, paint and the use of a non-approved jointing compound. If the inspection shows any of these signs, the yoke and shaft must then undergo a magnetic particle inspection procedure before being re-installed in the aircraft. Airworthiness Directive AD/R22/51 became effective on 12 November 2003 and AD/R44/51 [sic] became effective on 3 December 2003. Please feel free to contact me should you require any further information.
CASA supports the issues raised in the Air Safety Recommendation and advises that the Authority is currently reviewing the night visual flight requirements with a view to emphasising to pilots, through its safety promotion activities, the importance of considering the above factors. In response to the matters raised in the report, CASA wishes to bring the following to the attention of the ATSB. The report, at the heading of `Safety Deficiency' contains the following: 'The AIP does not require pilots to consider the amount of external visual reference that is likely to be available for a visual flight conducted at night. In particular, it does not require pilots to consider the amount of celestial illumination, the amount of terrain lighting, or the presence of a visual horizon either enroute, or at the destination aerodrome. Pilots are also not required to consider the presence of high-altitude cloud along the planned routes that may obscure celestial illumination.' CASA believes that the ATSB may have overlooked the "ground lighting" requirement specified in subparagraph 4.2(d) of Section 20.18 of the Civil Aviation Orders. Paragraph 4.2 states: "A helicopter shall not be operated under the Instrument Flight Rules unless it is equipped with: (a) the flight and navigation instruments specified in Appendixes VII, Vill, or IX to this section as applicable; (b) any other instruments, indicators or equipment specified it the helicopter flight manual; (c) the minimum lighting equipment specified in Appendix V to this section; and (d) an approved automatic pilot, or automatic stabilisation system, for other than night VFR flights except that in the case of such flight which will involve more than 30 minutes fight over water or over land areas where aircraft altitude cannot be maintained by reference to ground lighting, an approved autostabilisation
CASA does not agree that a review of night VFR requirements is necessary. Firstly, regulations specify that weather conditions of night VFR must be such that a planned flight can be conducted at a safe height clear of cloud. With respect to pilot competency, Civil Aviation Order (CAO) 40.2.2 specifies that the night VFR rating requires pilot be trained to control an aircraft solely by reference to instruments. Any notion that celestial lighting and/or an apparent visible horizon are appropriate references for the control of an aircraft by night is misleading and dangerous and increases the probability of pilot disorientation. ?? ?? ?? ??
CASA expressed concern that the report appeared to attribute the cause of the accident to night VFR regulations rather than the shortcomings in recruitment, induction and training. Moreover, CASA was troubled by the emphasis placed by ATSB on the need for specifying minimum ambient lighting requirements for night VFR operations. Reliance on ambient lighting at night rather than instruments for attitude reference is potentially hazardous due to the high risk of pilot disorientation. CASA strongly believes that the requirements specified in Civil Aviation Order (CAO) 40.2.2 are adequate for night VFR operations. It is the responsibility of the operators to ensure that pilots meet the requirements specified for rating issue, especially those related to instrument flying. Therefore, CASA does not believe that a review of these requirements is necessary given that Australia already has the most comprehensive night VFR pilot qualification.
The following response was received from the Civil Aviation Safety Authority 6 February 2004: On 21 November 2003, CASA advised the Bureau that in 2004, a helicopter specific issue of FSA is planned for release. The safety benefits to helicopter pilots and crew of wearing personal protective equipment will be considered for publication as part of that issue.
In relation to personal protective equipment for pilots, CASA does not legally require pilots to wear helmets although most pilots engaged in specialised helicopter aerial work activities do wear helmets. In relation to floatation devices, CASA does require Life Jackets to be worn when single engine helicopters are operating greater than gliding distance from land. This is detailed in Civil Aviation Order (CAO), 20.11, 5.1.1(a) and 5.1.7. However, if the aircraft is operating within gliding distance there is no legal requirement. Some operators that have crews engaged in specialised helicopter activities supply their flight crews with crew vests such as the Switlik IIV35C which act as a floatation device and provides pockets for Emergency Locator Transmitters and flares. CASA is of the view that all pilots engaged in these types of activities should be wearing helmets as there is sufficient evidence from accidents where helmets have saved the lives or reduced the severity of injuries to crews. In addition flight crew vests such as the Switlik are also a significant safety enhancement and should be encouraged. It is noted that ATSB are not recommending that CASA amend legislation but rather should raise awareness through safety promotion initiatives. CASA will draw this recommendation to the attention of its safety promotion areas for consideration and inclusion in future safety promotion actions.

ATSB Response
Closed-Accepted
Closed-Not Accepted
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Monitor
Closed-Not Accepted
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Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20030220	Initial Response	16/12/2003	6/02/2004	-	Recommendation	Civil Aviation Safety Authority
R20030220	Further correspondence	16/12/2003	11/09/2007	1365	Recommendation	Civil Aviation Safety Authority
R20030221	Initial Response	16/12/2003	6/02/2004	-	Recommendation	Civil Aviation Safety Authority
R20030221	Further correspondence	16/12/2003	11/09/2007	1365	Recommendation	Civil Aviation Safety Authority
R20030230	Initial Response	1/03/2004	3/05/2004	-	Recommendation	Civil Aviation Safety Authority
R20030230	Further correspondence	1/03/2004	14/03/2005	378	Recommendation	Civil Aviation Safety Authority
R20040013	Initial Response	15/01/2004	27/02/2006	774	Recommendation	AirServices Australia
R20040013	Initial Response	15/01/2004	17/02/2004	33	Recommendation	Civil Aviation Safety Authority
R20040014	Initial Response	15/01/2004	20/02/2004	-	Recommendation	AirServices Australia

Safety Finding
Safety Concerns With Helicopter Water-Bombing Operations
Safety Concerns With Helicopter Water-Bombing Operations
Safety Concerns With Helicopter Water-Bombing Operations
Safety Concerns With Helicopter Water-Bombing Operations
Safety Concerns With Helicopter Water-Bombing Operations
Carburettor Icing Information Available to Pilots
Carburettor Icing Information Available to Pilots
NAS Class E airspace procedures
NAS Class E airspace procedures
NAS Class E airspace procedures

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, assess the desirability of a requirement for Helicopter Underwater Escape Training for specialist aerial work operations, such as water-bombing in support of fire fighting operations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, assess the desirability of a requirement for Helicopter Underwater Escape Training for specialist aerial work operations, such as water-bombing in support of fire fighting operations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider advising Australian helicopter operators, involved in water-bombing in support of fire fighting operations, of the need to review the type of fire-buckets used to ensure that they comply with the bucket manufacturer's guidance for use on helicopter types and to ensure that they are appropriately maintained.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider advising Australian helicopter operators, involved in water-bombing in support of fire fighting operations, of the need to review the type of fire-buckets used to ensure that they comply with the bucket manufacturer's guidance for use on helicopter types and to ensure that they are appropriately maintained.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority issue advisory information to all pilots, restating the information contained in United States of America Federal Aviation Administration Advisory Circular AC 20-113 pertaining to aircraft engine induction system icing.
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The ATSB recommends that the Civil Aviation Safety Authority, in consultation with Airservices Australia and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.
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The ATSB recommends that Airservices Australia, in consultation with the Civil Aviation Safety Authority and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.

Organisation Response
Aviation Safety Standards has reviewed this recommendation and proposes to test the desirability of Helicopter Underwater Escape Training (HUET) with industry through the issue of a Discussion Paper or similar consultative arrangement. CASA expects that this issue will be canvassed when the post implementation review of Civil Aviation Safety Regulation (CASR) Part 133 occurs.
Helicopter Underwater Escape Training (HUET) was reviewed as part of the CASR Part 133 Discussion Paper DP00060S, however this was in a general sense only, with specific references being attached to over-water operations more than 10nm from land and for Marine Pilot Transfer (MPT) operations. The following section from the discussion paper refers: Comment 93 - DP Ref 133.825 - Life Jackets There were five responses to paragraph 133.825. Two disagreed with the donning requirements, two questioned the use of lifejackets in amphibious operations and one made reference to CAO 20.11 requirements. CASA response The proposed rule generally duplicates the requirements of Part 91, however, CASA believes that there is merit in emphasising when flotation equipment must be carried. Accordingly, the proposed rule has been amended to that effect. A requirement for underwater escape training has been inserted for crew members engaged in regular overwater operations. Disposition Paragraph 133.825 has been amended. Therefore with respect to this particular recommendation CASA has consulted as outlined except that consultation was within the general terms outlined in the draft CASR Part 133 and not specifically in regard to Aerial Fire Fighting operations. Aerial Fire Fighting Operations which are outlined in CASR Part 133 T.7 require the operator's operations manual to include a supplement that deals with fire fighting operations and do not specifically address the content of that supplement or the need for HUET. It is envisaged that as part of the process of assessing the Operations Manual supplement that deals with fire fighting operations, and within the priorities of its ongoing surveillance program, CASA will be reviewing the standard operating procedures of operators who conduct such operations with the view of assessing how effectively they are addressing the risks associated with this issue.
In response to the Bureau's recommendation, CASA is currently preparing a letter to helicopter operators in which the following issues will be highlighted: * Ensure the bucket is compatible with the helicopter for which it is to be used; * Ensure compatibility of the ring or the device to connect the hook and the bucket; * Ensure the operators maintenance program encapsulates the bucket and it's supporting equipment; and * Remind operators of their obligation to ensure that any aircraft component fitted from time to time to the aircraft is also maintained correctly in accordance with Civil Aviation Regulations (CAR) 39 and 41. CASA will seek comment on the content of the letter from major operators, including CHC, prior to its distribution.
CASA issued a letter (see below) to operators on 4 August 2004. With the impending fire season, CASA sees a benefit in re-issuing the letter and is arranging for it to be updated and sent. Notwithstanding that the ATSB was apparently advised in 2004 that the Flight Safety Australia article did not cover the action item in R20030221, CASA believes the article does actually cover the issues raised. ATSB Note: The Flight Safety Australia article, CASA issues safety advice for helicopter firefighting referred to in the CASA response text is available on page 10 of the July-August 2004 issue of the magazine and can be found at http://www.casa.gov.au/fsa/2004/aug/jul-aug04.pdf The text of the CASA letter referred to is included below: Subject: Rotorcraft In Fire Suppression Operations Using Underslung Equipment. Dear Sir or Madam, Using rotorcraft in aerial application operations, including fighting bush fires using a fabric "bucket" or similar equipment suspended from the cargo hook has become common practice. In response to the ATSB investigation into a recent near-fatal accident involving helicopter fire bombing operations using an underslung bucket, and with regard to the forthcoming fire-fighting season, CASA takes this opportunity to make the following recommendations to all rotorcraft operators who engage in similar aerial application operations. Ensure that: 1. The bucket is compatible with the helicopter with which it will be used. Bucket manufacturers should provide guidance with regard to the range of rotorcraft suitable for use with a particular model bucket. Ensure the applicable model bucket is deployed with the recommended helicopter type and model, and that the recommended bucket and helicopter combination is maintained throughout operations. 2. The cargo hook is appropriately maintained. CIVIL AVIATION REGULATIONS 1988, REG 39 (1) applicable to Class A helicopters, and CAR 41 (2) applicable to Class B helicopters, require that either a System of Maintenance or a maintenance schedule include provision for carrying out maintenance to all aircraft components from time to time included in, or fitted to, the helicopter. This includes the cargo hook. Operators therefore should have procedures in place to ensure the cargo hook assembly, plugs, wiring and the attaching structure is inspected at appropriate intervals while fitted to the helicopter. 3. The hook release mechanism is fully operational. The hook release systems, both manual, and electrical, should be functionally tested before commencing operations each day, and each time the hook assembly is fitted to a helicopter. The hook should be electrically "armed" during all sling operations, ready for quick release in an emergency. 4. The ring or device used to connect the bucket or load to the hook is compatible with the hook. A review of accidents involving loads slung from the hook, reveals that the use of the incorrect size and shape of the ring that links any load attached to the hook could have potentially disastrous results. Problems include an unintended release, (dynamic roll-out) where the strop or ring collapses the hook "keeper" or "mouse" and the load detaches from a closed hook. Another problem encountered has been the load not releasing when intended, even though the hook opens, due to the ring jamming on the hook assembly. CASA strongly recommends that all appropriate actions be completed, and the necessary procedures put in place before fire fighting operations commence to ensure that this service, so greatly appreciated by the community, is conducted safely.
CASA advised the Bureau that the Authority agreed with the recommendation and undertakes to run an appropriate article with reference to the United States of America Federal Aviation Administration Adversity Circular AC 20-113, in Flight Safety Australia. CASA undertakes to advise the ATSB when this article has been published.
In May 2004, CASA advised the Bureau that it agreed with the recommendation and undertook to run an appropriate article with reference to the United States of America Federal Aviation Administration Advisory Circular AC 20-113 in Flight Safety Australia (FSA). I am advised that articles relating to carburetor icing have been featured in previous editions of FSA; in particular, January/February 2000 and July/August 2001. However, CASA also published an article in the November/December 2004 edition in relation to carburetor icing in Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) operations. While this article does not specifically refer to AC 20-113, it does cover the same material contained in the AC. A copy of the article is attached for your information. In addition, it should be noted that CASA also runs a series of seminars relating to aircraft icing. That seminar addresses the hazards of various forms of icing and recognition of icing conditions with particular emphasis on carburetor icing.
The recommendation was reviewed following the implementation of new airspace procedures 24 November 2005 and the provision of additional information (Flying Around - Avoid a VCA) on the Airservices Australia website 27 February 2006.
CASA agrees with this recommendation. A review of Stage 2b of the NAS has commenced and information is being obtained from all stakeholders and analysed by the Authority. CASA has additionally been meeting with both Airservices Australia and the National Airspace System Implementation Group on this matter. CASA undertakes to advise the Australian Transport Safety Bureau of any outcomes as this matter progresses.
Airservices Australia has conducted a review of all of the issues related to the Launceston incident including those issues specifically sighted in the ATSB recommendation. The observations, initiatives and recommendations listed below have been fully discussed with CASA and the NASIG, and we are currently working to ensure implementation is properly coordinated. As a part of our normal risk monitoring processes, reports from electronically submitted incident and event reports are continuously reviewed. The information, available up until 17 February 2004 indicates that 60 (6.5%) of all reported incidents (915) can be assessed as relating to the changes made on 27 November 2003. Of these 60 incidents 81.6% are pilot attributable with the main factors either being pilots failing to comply with the new changes or violating controlled airspace. This data has shown that pilot education and training has not been as effective as it was expected to be. The ATSB Report also highlighted a possible misunderstanding by pilots of the intent of the pilot education and training. Airservices proposes the following strategies to address the issues concerning pilot education and training: (a) That CASA conduct a quality assurance assessment of the pilot training and education as well as pilot comprehension of the material. Confirmation that pilots correctly understand the published material, especially the general aviation segment, is important to the safe operation of the airways system; and (b) That further pilot education be developed with a particular re-emphasis on requiring pilots to: (i) Monitor the most appropriate frequency to assist in situational awareness; (ii) Make radio contact with flights considered to be in potential conflict to assist in situational awareness; (iii) Comply with the need for transponder carriage, use serviceability; and (iv) Recognise that the more flexible procedures and airspace introduced on 27 November 2003 places additional responsibility on pilots and that the ongoing safety of the system requires that they comply and understand the requirements which permit this additional flexibility. CASA was advised of these pilot training and education strategies on 16 January 2004, and subject to their agreement, CASA would be responsible for implementation. The review of incident data and the ATSB Report also raised an issue of pilot situational awareness, especially within Class E airspace. Transponder non-usage and/or unserviceability has also been a noticeable trend and can be associated with the situational awareness issue. Immediate strategies that address this issue are as follows: (a) To assist pilots to choose the most appropriate frequency and assist them in gaining situational awareness, a frequency planning chart will be published depicting enroute frequencies in Class G and Class E airspace. This is an interim chart until the normal charting cycle takes affect and will be published and distributed within the next month. (b) That information be issued to air traffic controllers reiterating the importance of their radio broadcasts as these broadcasts also provide situational awareness to aircraft. This information has been published and took effect on 1.9 January 2004. (c) That procedures be developed and promulgated that require pilots, that have unserviceable transponders, to have them repaired as soon as practicable following notification by ATC of unserviceability. Again this strategy will require agreement with and subsequent implementation by CASA. Further work is also continuing on rectifying a design issue with the control area steps to the north east of Launceston. The current design can contribute to a steeper than normal descent profile. CASA were advised of these further strategies on 16 January 2004. The NASIG were advised of all of the above mentioned strategies at a meeting held on 23 January 2004 and again at a meeting with the NASIG and [name

ATSB Response
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Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20040014	Further correspondence	15/01/2004	28/06/2007	1260	Recommendation	AirServices Australia
R20040015	Initial Response	13/01/2004	29/04/2004	-	Recommendation	Civil Aviation Safety Authority
R20040015	Further correspondence	13/01/2004	12/11/2004	304	Recommendation	Civil Aviation Safety Authority
R20040016	Initial Response	13/01/2004	28/04/2004	106	Recommendation	Civil Aviation Safety Authority
R20040017	Initial Response	13/01/2004	29/04/2004	107	Recommendation	Civil Aviation Safety Authority
R20040018	Initial Response	13/01/2004	29/04/2004	-	Recommendation	Civil Aviation Safety Authority
R20040018	Further correspondence	13/01/2004	12/11/2004	304	Recommendation	Civil Aviation Safety Authority
R20040019	Initial Response	13/01/2004	29/04/2004	107	Recommendation	Civil Aviation Safety Authority
R20040020	Initial Response	13/01/2004	29/04/2004	107	Recommendation	Civil Aviation Safety Authority
R20040039	Initial Response	18/03/2004	28/05/2004	71	Recommendation	Civil Aviation Safety Authority
R20040041	Initial Response	18/03/2004	28/05/2004	71	Recommendation	Civil Aviation Safety Authority
R20040042	Initial Response	18/03/2004	28/05/2004	71	Recommendation	Civil Aviation Safety Authority
R20040052	Initial Response	12/05/2004	14/07/2004	-	Recommendation	Civil Aviation Safety Authority

Safety Finding
NAS Class E airspace procedures
Limitations of the See-and-Avoid Principle
Limitations of the See-and-Avoid Principle
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Limitations of the See-and-Avoid Principle
Limitations of the See-and-Avoid Principle
HF - Drug and Alcohol Test and Education
HF - Drug and Alcohol Test and Education
OPS - Risk managment and Surveillance Methodologies
Helicopter Instrumentation and Night VFR Flying

Safety Issue
The ATSB recommends that Airservices Australia, in consultation with the Civil Aviation Safety Authority and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.
The CAA should take into account the limitations of see-and-avoid when planning and managing airspace and should ensure that unalerted see-and-avoid is never the sole means of separation for aircraft providing scheduled services. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991 and in 2001 the ATSB and CASA agreed that the word 'never' had been overtaken by the Australian Risk Management Standard - See Background to Recommendation.
The CAA should take into account the limitations of see-and-avoid when planning and managing airspace and should ensure that unalerted see-and-avoid is never the sole means of separation for aircraft providing scheduled services. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991 and in 2001 the ATSB and CASA agreed that the word 'never' had been overtaken by the Australian Risk Management Standard - See Background to Recommendation.
In light of the serious limitations of the see-and-avoid concept, the CAA should continue to closely monitor the implementation of TCAS in the US and should consider the system for Australia. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991.
The CAA should ensure that pilots are trained in effective traffic scans. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991.
The CAA should require white strobes rather than red rotating beacons to assist visbility when the aircraft appears against dark backgrounds. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991.
The CAA should require white strobes rather than red rotating beacons to assist visbility when the aircraft appears against dark backgrounds. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991.
The CAA should ensure that pilots are aware of the physiological and psychological limitations of the visual system. Note: The Recommendation was issued to the [then] Civil Aviation Authority (CAA) in 1991.
Pilots should recognise that they cannot rely entirely on vision to avoid collisions. Consequently, they should attempt to obtain all available traffic information, whether from Air Traffic Services or a listening watch, to enable them to conduct a directed traffic search.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the Department of Transport and Regional Services, establish the safety benefits of the introduction of a drug and alcohol testing program to the Australian aviation industry for safety-sensitive personnel. Where possible, this program should harmonise with existing and evolving national and international regulations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority revise the content of the pilot Day VFR Syllabi to include contemporary aviation medical knowledge regarding the effects of alcohol and illicit drugs use on human performance, and disseminate that information to qualified pilots via a comprehensive education program.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their Safety Trend Indicator process, including with a view to developing a methodology to assist in objectively assessing potential at-risk organisations. That should include formal 'triggers' that enable the consistent prediction of the requirement for additional surveillance until CASR Part 119 takes full effect.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring a standby attitude indicator, with an independent power source, in all helicopters operating flights under the NVFR in the Charter and Aerial Work category, excluding dual pilot training.

Organisation Response
Airservices Australia advised that pilot education material was distributed as part of the NAS 2c changes implemented 24 November 2005. Also, AIP charts were amended to include additional frequency information to assist pilots to monitor the Class E radio frequency.
Firstly, we will be using our existing cost benefit formula (which is based on the proven FAA Formula) to mandate Class D airspace where traffic densities require. CASA also proposes a complete package to address this important issue. Unfortunately, unalerted see and avoid can not be eliminated entirely, as even if primary and secondary radar, Class A airspace, mandatory radio, TCAS and transponders were deployed, there can always be a time, because of human factors or technical breakdown, that unalerted see and avoid becomes the primary means of separation. The CASA proposal is to do everything we can, while still allocating the safety dollars effectively, to reduce the chance of unalerted see and avoid being the primary means of separation, whilst at the same time educating pilots on how they can improve their scan to improve the effectiveness of both alerted and unalerted see and avoid. In relation to our package to improve the availability of alerted see and avoid, we have proposed to the airlines that in future, all airports serviced by scheduled services of over 10 passengers must have third party confirmation that the radio is on frequency. This will reduce the chance of an airline/aircraft being on the wrong frequency or the speaker is being deselected. We are also encouraging the fitment of Aerodrome Frequency Response Units which will operate 24 hours per day and reduce the chance of unalerted see and avoid. We are proposing to increase the number of recommended calls at non-tower aerodromes to seven, following the USA procedure. This will greatly assist alerted see and avoid. In order to reduce the necessity to rely on see and avoid, we will be training VFR pilots to remain clear of areas of IFR traffic density, such as IFR air routes or IFR approach paths. These will be marked on maps in future. In relation to IFR aircraft, we will be training pilots to follow a recommendation to fly .1 nm to the right of track when flying on a marked air route between navigational aids or reporting points when the airway is used for two-way traffic. In places where a tower is not cost effective and that have RPT services of over 10 passengers, we will have mandatory procedures in relation to alerting.
At our meeting on November 3, I undertook to follow up CASA's response to the outstanding recommendations contained in the 1991 BASI research report on the limitations of see and avoid. As you would be aware, most of the recommendations - including those concerning TCAS and the education initiatives - have been implemented and continue to provide positive safety outcomes for Australian aviation. In respect of the remaining recommendations, CASA provides the following response. "The CAA should take into account the limitations of see-and-avoid when planning and managing airspace...." CASA agrees that the limitations of see-and-avoid should be taken into account when planning and managing airspace. Where traffic densities are such that see-and-avoid does not provide the required level of safety, CASA will require Class D or a higher level of airspace. ....and should ensure that unalerted see-an-avoid is never the sole means of separation for aircraft providing scheduled services." CASA understands the intent of this recommendation but does not agree with its absolute form. The wording of the recommendation reflected its time and was prior to the 1995 Standards Australia AS/NZS4360 Risk Management Standard. CASA also understands that the use of the absolute "never" is not consistent with current ATSB practice. To accept the absolute form of the recommendation would require the allocation of Class D or higher airspace wherever scheduled services operate. This would result in an allocation of resources that is not commensurate with risk. ICAO Class E and G airspace specifically has no radio requirement for VFR aircraft. ICAO has introduced both of these classifications with the full knowledge of the limitations of see-and-avoid. ICAO makes no recommendation in relation to scheduled services not operating in these airspace classifications. Overly discounting the effectiveness of see-and-avoid and devising unique procedures has itself led to unintended consequences that are unresolved. Pilots may scan significantly less and become over reliant on radio alerting through a concept known as diffusion of responsibility. The BASI report RP/93/01 (December 1993) and the continuing incident reports that are being filed listing near misses in mandatory radio Class E and G airspace may support this concern. CASA believes that radio alerting is only effective when the alerting area is small with readily identifiable reporting points so that the alert is specific.
Agreed and will be introduced where cost effective.
Agreed and CASA will continue to emphasise that see-and-avoid is a key factor in collision avoidance and pilots should be vigilant.
CASA feels that rotating beacons and strobe lights should be used whenever an aircraft is airborne or is taking off, landing, or taxying or being towed (including temporarily stopped while being towed) on an active runway. Pilots are not always able to assess when the display of these lights is effective, so CASA recommends their use on every flight.
CASA does not accept this recommendation. Whilst it is acknowledged that there are some circumstances in which visibility would be enhanced by the use of white strobe lights in place of red rotating beacons there would only be a marginal reduction in the level of risk when taken in the total context of collision avoidance strategies. CASA would not be able to sustain with industry, the argument for such equipage on a demonstrable cost benefit basis.
CASA agrees with both the above recommendations. However CASA believes that the limitations have been promoted to the extent that benefits of the visual system may have become seriously discounted. As a consequence, CASA will continue to emphasise the requirement to be vigilant.
CASA agrees with both the above recommendations. However CASA believes that the limitations have been promoted to the extent that benefits of the visual system may have become seriously discounted. As a consequence, CASA will continue to emphasise the requirement to be vigilant.
The following response dated 28 May 2004 was received from the Civil Aviation Safety Authority: Thank you for providing the Authority with a copy of Air Investigation Report 200204328 on the accident involving a Piper PA-32-300 aircraft registered VH-MAR, which occurred at Hamilton Island Aerodrome, OLD on 26 September 2002. I apologise for the delay in replying. CASA has reviewed the report and provides the following comments in response to Recommendation 20040039: A review of the safety benefits of introducing a drug and alcohol testing programme for safety-sensitive personnel in the Australian aviation industry was announced by the Deputy Prime Minister and Minister for Transport and Regional Services, the Hon John Anderson MP on 18 March 2004. The team reviewing the safety benefits has been drawn from the Department and CASA and reports regularly to a Steering Committee comprising the Department's Assistant Secretary, Aviation Operations, and CASA's Executive Manager, Corporate Affairs. The terms of reference were included and can been viewed at the response from the Department of Transport and Regional Services (see response to R20040040).
The Day VFR (Aeroplane) Syllabus and the Day VFR (Helicopter) Syllabus have been enhanced to include contemporary aviation medical knowledge regarding the effects of alcohol and illicit drugs use on human performance. The additional information, which is included in all new syllabi, can be purchased by industry personnel or can be accessed on the Authority's website. Please note however that the helicopter syllabus will be posted on the CASA website once the document has been reformatted and proof read. The syllabi can be found at http://www.casa.gov.au/avreg/fcl_lic/index.htm.
CASA response As noted in the Authority's response of 6 February 2004, the STI is used in conjunction with industry intelligence and other resources, as a management tool to assist Aviation Safety Compliance staff determine the planning and scope of surveillance activities. However, the Bureau's report appears to inappropriately assume that the STI is a direct measure of a company's safety, rather than a means of prioritising resources to gain information by means of an on-site audit. The STI does not record the presence of regulatory breaches or other hazards that must be corrected. Rather, it collects information on factors that suggest the greater likelihood of such hazards being present. For example, the fact that a company has recently made changes to its organisational structure does not in itself imply a decrease in safety. In fact some changes may have been implemented to correct previously identified deficiencies. Nevertheless, the introduction of a new organisational structure does increase the likelihood that there could be disruptions to existing safety systems or see new, untested, systems introduced. For this reason, the STI is used not to identify specific problems but rather to prioritise companies for audits. In other words, companies that have relatively high STI scores should receive more frequent audits than other companies. CASA is currently progressing with the implementation of Mark 2 of the STI. However, this remains but one tool within a suite of safety management strategies used by CASA. In order to reduce the safety risks associated with flight operations and related ground operations, CASA is currently introducing a Safety Management Systems (SMS) approach for passenger carrying operations. The new regulations will mandate the implementation of a SMS and AOC holders will be transitioned to the new regulatory requirements through a case management process. Training sessions on SMS have already commenced and are attended by CASA officers and industry personnel. In addition, CASA's new surveillance procedures direct inspectors to conduct safety auditing using the systems approach. The main areas of significant change initiated recently include: ? thorough pre-audit preparation and consideration given to safety intelligence, audit objectives and targeted scooping; ? recording and reporting of findings; and ? follow-up and planning of subsequent action. The Authority's systems approach and application of risk management methods places greater emphasis on the notion of 'shared responsibility' between the regulator and operator for safe operations.
Issues raised in the recommendations relate to Civil Aviation Safety Regulation (CASR) Part 133, which is currently under review. Therefore, until the review is complete, CASA is unable to provide the ATSB with any substantial comment.

ATSB Response
Closed-Accepted
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Closed-Accepted
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Open
Open
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Partially Accepted
Open

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20040052	Further correspondence	12/05/2004	21/07/2004	70	Recommendation	Civil Aviation Safety Authority
R20040053	Initial Response	12/05/2004	14/07/2004	-	Recommendation	Civil Aviation Safety Authority
R20040053	Further correspondence	12/05/2004	21/07/2004	70	Recommendation	Civil Aviation Safety Authority
R20040054	Initial Response	29/03/2004	12/08/2004	-	Recommendation	Civil Aviation Safety Authority
R20040054	Further correspondence	29/03/2004	13/08/2004	137	Recommendation	Civil Aviation Safety Authority
R20040056	Initial Response	4/05/2004	29/06/2004	56	Recommendation	AirServices Australia
R20040057	Initial Response	4/05/2004	5/07/2004	62	Recommendation	Civil Aviation Safety Authority
R20040058	Initial Response	12/05/2004	14/07/2004	-	Recommendation	Civil Aviation Safety Authority
R20040058	Further correspondence	12/05/2004	26/05/2005	379	Recommendation	Civil Aviation Safety Authority
R20040062	Initial Response	7/06/2004	23/07/2004	-	Recommendation	AirServices Australia
R20040062	Further correspondence	7/06/2004	10/12/2004	186	Recommendation	AirServices Australia

Safety Finding
Helicopter Instrumentation and Night VFR Flying
Helicopter Instrumentation and Night VFR Flying
Helicopter Instrumentation and Night VFR Flying
Cadmium Plating of high-strength steel engine through-bolt nuts
Cadmium Plating of high-strength steel engine through-bolt nuts
OPS - Assessment of Collision Risk at GAAP Airports
OPS - See and Avoid Advisory Information for Pilots
Engine Emergency Power Lever Usage in the C208
Engine Emergency Power Lever Usage in the C208
Absence of Procedural Separation
Absence of Procedural Separation

Safety Issue
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring a standby attitude indicator, with an independent power source, in all helicopters operating flights under the NVFR in the Charter and Aerial Work category, excluding dual pilot training.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring an autopilot or stability augmentation system in all single pilot helicopter operating flight under the NVFR, in the Charter and Aerial Work category, excluding dual pilot training.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring an autopilot or stability augmentation system in all single pilot helicopter operating flight under the NVFR, in the Charter and Aerial Work category, excluding dual pilot training.
The ATSB recommends that the Civil Aviation Safety Authority review MAF Aviation Services Engineering Order 0071-001 E1 and the cadmium plating and baking process controls employed by the plating subcontractor to determine if the process and process controls prevent the occurrence of hydrogen-induced delayed cracking in high-strength steel engine through-bolt nuts.
The ATSB recommends that the Civil Aviation Safety Authority review MAF Aviation Services Engineering Order 0071-001 E1 and the cadmium plating and baking process controls employed by the plating subcontractor to determine if the process and process controls prevent the occurrence of hydrogen-induced delayed cracking in high-strength steel engine through-bolt nuts.
The Australian Transport Safety Bureau recommends that Airservices Australia estimate the overall midair collision risk at major general aviation airports (Archerfield, Bankstown, Jandakot, Moorabbin and Parafield) and compare these estimated risk levels with relevant acceptable risk criteria.
The Australian Transport Safety Bureau recommends that CASA develop formal advisory material for pilots, based on relevant research and publications, about collision risk management strategies. This formal guidance material should include, but not necessarily be limited to, information on visual scanning techniques, situations where visual scanning is most important, other techniques to increase the likelihood of detecting other aircraft, types of spectacles and sunglasses best suited for aviation tasks, and collision avoidance
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the safety benefit of mandating Cessna Alert Bulletin CAB01-15 with regard to the Emergency Power Lever on all Approved Single Engine Turbine Powered Aeroplane Australian registered C208 aircraft.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the safety benefit of mandating Cessna Alert Bulletin CAB01-15 with regard to the Emergency Power Lever on all Approved Single Engine Turbine Powered Aeroplane Australian registered C208 aircraft.
The Australian Transport Safety Bureau recommends that Airservices Australia review the effectiveness of its check and training program in the area of procedural control services.
The Australian Transport Safety Bureau recommends that Airservices Australia review the effectiveness of its check and training program in the area of procedural control services.

Organisation Response
As part of the consultation process associated with the development of Civil Aviation Safety Regulation (CASR) Part 133, CASA consulted with the Helicopter Association of Australia (HAA) and the general helicopter industry regarding the benefits of a standby attitude indicator. On the basis of these consultations, CASA has assessed the safety benefits of requiring a standby attitude indicator with an independent power source, and determined that greater emphasis should be placed on training pilots carrying out NVFR flight. CASA considers this to be a more effective approach than introducing a mandatory requirement for the fitment of a secondary attitude reference instrument. Therefore, CASA has taken steps in CASR Part 133 to strengthen recurrent training and checking and operator proficiency checks for pilots undertaking NVFR flights in helicopters engaged in air transport operations. It will also apply to those engaged in Emergency Medical Service (EMS), Search and Rescue (SAR) and Marine Pilot Transfer operations as well as any other aerial
Issues raised in the recommendations relate to Civil Aviation Safety Regulation (CASR) Part 133, which is currently under review. Therefore, until the review is complete, CASA is unable to provide the ATSB with any substantial comment.
CASA has reviewed the recommendation and believes that it will be addressed with the introduction of CASR Part 133. Included in CASR Part 133 is a general statement that provides practical and effective approach to this aspect of the safety of NVFR flight in rotorcraft. An extract from that Part is provided below for your information. 133.360 Instruments and equipment- General Subparagraph (2) For a night VFR flight by a rotorcraft involving flight over water beyond a distance from land at which a coastline would be visible at night in VMC at 500ft amsl, or over land areas where rotorcraft attitude cannot be maintained by adequate illumination of surface features or by reference to ground illumination of surface features or by reference to ground lighting or a visible discernible horizon, the operator must ensure that the rotorcraft: a) is equipped with an approved automatic pilot; or b) is equipped with an approved automatic stabilisation system; or c) carries a 2 pilot crew.
CASA will review MAF Aviation Services Engineering Order 0071-001 El and the cadmium plating and baking process controls employed by the plating subcontractor. The Authority undertakes to provide the Bureau with details of the review once completed.
CASA contacted MAF and reviewed Aviation Services Engineering Order 0071-001 E1 and the cadmium plating and baking process controls employed by the plating subcontractor. The following points provide a summary of that review. * The MAF Engineering Order (EO) has called up cadmium plating in accordance with the established standard QQ-P-416, now referred to as SAE-AMS-QQ-P 416. * MAF Interpretation of the QQ-P-416, resulted in it not requiring the stress relief treatment prior to plating (QQ-P-416 3.2.2) and was therefore not performed on the affected nuts. The MAF interpretation was based on these items not being new (ie. not newly manufactured as specified in QQ-P-416), hence not requiring the stress relief process. * The MAF EO required hydrogen embrittlement relief treatment in accordance with QQ-P-416 after plating, 150 KSI and above. * MAF amended the EQ and deleted the cadmium plating approval for the affected nut in March 2004 (post the failed incident). * MAF further amended the EO and required all parts listed in the EO be stress relieved prior to plating. Additionally, the Order also required hydrogen embrittlement relief after plating. * MAF has advised CASA that they now only use new nuts (P/N 652541) on the engines. * MAF does not consider the use and/or location of the standard hardware under consideration for cadmium plating. However, the organisation has evaluated the cadmium plating type, class, strength and process for each item under consideration for plating approval. CASA was unable to determine if performing the pre-plating stress relief process resulted in a failure on this occasion. The ATSB's report implies that the failure is more consistent with no hydrogen embrittlement treatment post plating, which was required by the MAF EQ. I am advised that during the forthcoming audit of MAF, CASA intends to discuss this issue further with the relevant MAF design persons. It should also be noted that an article on the aspects of cadmium plating and hydrogen-induced embrittlement is planned for the upcoming edition of Flight Safety
I refer to the ATSB investigation report into the May 2002 accident at Bankstown airport. Specifically, I refer to recommendation 20040056 and our considerations of this matter. While to the uninformed, the recommendation looks to be innocuous, it involves some fairly complex issues and can not be easily or quickly dealt with. The recommendation involves two separate issues, the estimate of the midair collision risk at the major GA airports, and the identification of acceptable risk criteria. Apart from simply plucking a number out of the air, the only way we can effectively estimate the midair collision risk is to develop a mathematical model that could be applied to the major GA airports. The model would have to be tailor made to cater to the specific environment, procedures and traffic mix found at those airports and would involve a number of assumptions and estimates. Collecting the data to input to a collision risk model of the type referred to above would also be difficult, as the recommendation does not distinguish between aircraft operations while the towers are manned (GAAP), and operations during the time the towers are closed (MBZ). We would have to undertake special out of hours aircraft activity monitoring and develop the model in such a way that it could cater to both types of operations. The matter of identifying appropriate acceptable risk criteria, is a slightly easier issue to deal with, but has one draw back. As you are aware, we do not currently accept the proposed CASA acceptable risk criteria as we believe it has particular technical problems. We could, and probably will develop our own acceptable risk criteria, however, this will leave us with a criteria that has little independence. We will discuss this matter further with CASA. From the internal discussions we have had so far, we have concluded that employing a consultant to undertake much of the work would be the most efficient way to proceed. However, we have also concluded that the process will take something in the order of six months and costs tens of thousands of dollars. With these resource issues in mind, we are wandering as to the worth of the final product. In spite of the time and money spent on pursuing this issue, the final product will be little more than a number that, provided we don't have any significant changes to any of the contributing variables may give us a reliable risk metric. The concern is that the process of estimating and validating the risk metric will consume a reasonably large amount of time and resource, while adding little or nothing to the safety of our operations. I can't help thinking the time and resources could be better used on other projects. We have not yet made a clear decision about our final response to the recommendation. However, we felt it was necessary to give you an undertaking that we are actively considering it.
CASA has published a number of articles relating to "See and Avoid". The most recent of these articles was published in the September/October 2003 edition of Flight Safety Australia, A copy of this edition is attached for your information. CASA will consider this recommendation in the new training standards currently being developed for Civil Aviation Safety Regulation (CASR) Part 61.
CASA has assessed the safety benefit of mandating Cessna Alert Bulletin CAB01-15 and has agreed to issue an Airworthiness Directive (AD), which will mandate the Cessna Bulletin.
The Civil Aviation Safety Authority issued Airworthiness Directive AD/CESSNA 208/18 Emergency Power Lever Shear Wire on 26 May 2005.
Currently Airservices can see no justification to support this recommendation if it is based on the single incident referred to in the brief. The individual involved was checked following the incident and returned to duty. It should also be noted, as referenced in the report, refresher training for all tower controllers has been provided in radio telephony in regard to visual separation which was an error in the incident.
I write in response to a letter from (name deleted) which was dated the 18th of August 2004. This letter indicated that our previous response to recommendation R20020062 was not accepted by the ATSB as it was believed that Airservices Australia had taken the literal interpretation of the recommendation and had focused on visual separation. The letter suggested on the basis of a list of incidents provided that Airservices Australia take a broader review of the effectiveness of Airservices Australia's check and training program in the area of procedural control services. Following receipt of this letter, (name and position deleted) undertook a review of the occurrences provided (see commentary provided at Appendix A). This review compliments the analysis completed for the Breakdown of Separation (BoS) Review which was conducted in 2003, and the post-implementation review of the associated BoS Recommendation project which also evaluated incidents from a controller performance stand point. In neither review did Airservices Australia identify unhealthy norms or systemic performance issues within the procedural Tower environments. These reviews conclude that Airport Services conducts performance checks in accordance with the requirements of the CATSOAM. The mandated CATSOAM checking regime is complimented by the Cross Unit Evaluations which are conducted on an annual basis within Airport Services. This program demands that a selected ATC from a like type tower (eg GAAP, regional, radar) evaluate the operations at another Tower. The Tower Manager and one other controller are checked by the visiting ATC to ensure that the standard of checking is maintained at the highest level. A full and comprehensive report is supplied after each of these station checks. Each year like type tower conferences are held [GAAP, Regional and RADAR] and all aspects of check and training are raised in the forum. As recognised in your letter, one of the most difficult aspects of Regional Tower Control is the concept of procedural separation and its application in the different classes of airspace and different categories of aircraft. The number of ATC's that fail to achieve rating standard in our regional ports is testimony to the importance of this concept being fully understood. The training for rating and subsequent checks to maintain ratings, is intensive and exhaustive, and we remain convinced that we do not have a systemic problem with our checking regime for procedural towers. Appendix A Hamilton Island 25/5/1999 No separation standard was applied. Argyle WA 19/3/2001 Not a Tower issue. Tamworth 27/6/2001 This is not a procedural separation issue for the tower as such. The aircraft was on a visual approach entering the circuit and failed to join final as instructed resulting in the aircraft flying through final. The controller was not required to apply a procedural standard as he was using visual separation at the time. This occurrence is a failure on the pilot in command to comply with procedures. Albury 8/7/2002 In this breakdown, the understanding of the procedural separation requirement is quite clear. The phraseology was poor. Mackay 16/11/2002 Separation Standard was not applied. Mackay 29/1/2004 Separation Standard was technically infringed as the ATC used TSAD to establish one aircraft OCTA. The ATC fully understood the procedural standard. Hamilton Is 17/7/04 A procedural standard had been established between the aircraft. Misunderstanding of circuit entry direction then led to a breakdown in separation.

ATSB Response
Closed-Accepted
Open
Closed-Accepted
Monitor
Closed-Accepted
Closed-Partially Accepted
Closed-Partially Accepted
Monitor
Closed-Accepted
Open
Closed-Partially Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20040063	Initial Response	7/06/2004	23/07/2004	-	Recommendation	AirServices Australia
R20040063	Further correspondence	7/06/2004	16/09/2005	466	Recommendation	AirServices Australia
R20040064	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040065	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040066	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040067	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040068	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040069	Initial Response	25/06/2004	23/08/2004	59	Recommendation	Civil Aviation Safety Authority
R20040074	Initial Response	25/10/2004	7/12/2004	43	Recommendation	Civil Aviation Safety Authority

Safety Finding
Absence of Procedural Separation
Absence of Procedural Separation
ENG-Operator Compliance with Turbine Engine Condition Monitoring
ENG- CASA Surveillance processes
ENG-CASA Inspector Guidelines
ENG-CASA Inspector Guidelines
OPS - CASA Formal Advisory Information - engine failures
OPS - Synthetic Training Devices
Raytheon B300 cabin door in-flight seperation

Safety Issue
The Australian Transport Safety Bureau recommends that Airservices Australia review the MATS amendment decision that removed the mandatory requirement to provide traffic information to aerodrome traffic.
The Australian Transport Safety Bureau recommends that Airservices Australia review the MATS amendment decision that removed the mandatory requirement to provide traffic information to aerodrome traffic.
The ATSB recommends that CASA conduct a national review of the level of operator compliance with the requirements of mandatory turbine engine condition monitoring programs, particularly for passenger carrying operations.
The ATSB recommends that CASA review its surveillance processes to ensure that, during future surveillance activities, priority is given to confirming operator compliance with the requirements of mandatory turbine engine condition monitoring programs, particularly for passenger carrying operations.
The ATSB recommends that CASA review its airworthiness surveillance processes and Certificate of Approval assessment processes to ensure that it provides adequate guidelines to assist CASA inspectors to identify priority areas for consideration during surveillance and approval activities, such as programs for compliance with the requirements of Airworthiness Directives.
The ATSB recommends that CASA review its airworthiness surveillance processes and Certificate of Approval assessment processes to ensure that it provides specific guidelines to assist CASA inspectors to assess whether a maintenance organisation has adequate personnel resources to conduct its required activities.
The ATSB recommends that CASA consider providing formal advisory material for operators and pilots, based on relevant research and publications, about managing engine failures and other emergencies during takeoff in multi-engine aircraft below 5,700 kg MTOW. This material should include the factors to be considered by operators when developing procedures for responding to such emergencies.
The ATSB recommends that CASA consider and evaluate options to improve the suitability of industry practices for training pilots to make appropriate decisions when responding to engine failures and other emergencies during critical phases of flight in multi-engine aircraft below 5,700 kg MTOW. This review should include an assessment of the suitability of utilising synthetic training devices for the purpose of training pilots to make decisions regarding emergencies.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise operators of Beechcraft King Air and Raytheon King Air aircraft of the potential safety deficiency of the cabin door warning system becoming prematurely earthed, resulting in a sense switch or switches no longer providing an electrical signal for its or their position. The recommendation was simultaneously issued as R20040075 to the US Federal Aviation Administration. ATSB comment: In response to ATSB Recommendation R20040074 issued on 25 October 2004, CASA issued AWB31-3 issue 1 on 10 February 2005 to address the sense switch problem.

Organisation Response
This is agreed A MATS amendment process has been initiated regarding the mandatory requirement to provide traffic information to aerodrome traffic. The current instruction is in contravention of the CASR Part 172 Manual of Standards (MOS) and is being rectified. This difference between the MATS and the Part 172 MOS was due the MATS being amended and updated between the development and the implementation of the MOS.
On 1 September 2005, Airservices Australia amended the Manual of Air Traffic Service to completely remove the previously amended section 4.5.2.3 relating to the provision of aerodrome traffic information. On 16 September 2005, the Civil Aviation Safety Regulation Part 172 Manual of Standards was amended, after agreement between CASA and Airservices Australia, to state: When aircraft are operating visually as aerodrome traffic ATC must issue 1 or more of the following: (a) clearances designed to maintain separation (b) sequencing instructions (c) relevant traffic information
Audit elements covering turbine engine condition monitoring programs (ECMP) are already included in the 2004/05 surveillance program of airlines, and are reflected in the Control Group Inspectors (CGI) Handbook. Furthermore, I am advised that after 2004/05, Airline Operations Branch will also add this element to the audit list in its Regulatory Oversight System trial and will be scoped according to risk. I understand that the CASA's General Aviation Operations Branch has engine trend monitoring as an element for aircraft maintenance audits. However, it is not intended that this will be an element of particular focus.
Please refer to CASA's response to recommendation R20040064.
Legislation relating to the approval of a maintenance facility is outlined in Civil Aviation Regulation (CAR) (1988) 30. 1. A person engaged, or intending to engage, in any stage of design, distribution or maintenance of aircraft, aircraft components or aircraft materials, or in the training of candidates for, or in the conducting of, the examinations referred to in paragraph 31 (4) (e) may apply to CASA for a certificate of approval in respect of those activities. 2. An application must be in writing and must: (a) set out the following: (i) a statement of the activities to be covered by the certificate; (H) the address of the main place (if any) at which the applicant proposes to carry out those activities; (Hi) the number of appropriately qualified or experienced persons employed by the applicant who will be involved in carrying out those activities; and (b) have with it evidence of: (i) the relevant qualifications and experience of the applicant and the applicant's employees; and (H) the facilities and equipment available to the applicant for the carrying out of the activities; and (Hi) the arrangements made to ensure the applicant has, and will continue to receive, information necessary for the carrying out of those activities; and (iv) a system of quality control that satisfies the requirements of subregulation (20); and (c) if maintenance of class A aircraft is an activity to be covered by the certificate -have with it a copy of the procedures manual, in which the system of quality control procedures must be set out, that the applicant proposes to use if the certificate of approval is granted. When an application is made the following criteria is required to be addressed to satisfy the requirements of paragraph (20) of CAR 30: (20) In deciding whether it is satisfied as mentioned in subregulation (2A), CASA must have regard to: (a) the relevant qualifications and experience of the applicant and the applicant's employees; and (b) the facilities and equipment available to the applicant for the carrying out of those activities; and (c) the arrangements made to ensure the applicant has, and will continue to receive, the information necessary for the carrying out of those activities; and (d) the applicant's system of quality control; and (e) if the applicant is required by paragraph (2) (c) to have a procedures manual- the applicant's procedures manual. In order to comply with this legislation, CASA inspectors are required to utilise the Certificate of Approval Procedures Manual. The current process requires that applicants make an initial application to the CASA Service Centre, who will co-ordinate the application process, before forwarding the application to the appropriate Area Office for assessment. It is at this point that detailed assessment of the organisations procedures, facilities, equipment, technical data and qualified personnel is performed. The COA Procedures Manual Assessment Procedures states that: "Discretionary powers are provided under CAR 30(28) and these should be fully utilised by the Inspector to achieve and maintain a high standard of quality and competence among new applicants. The aim of the assessment is to ensure that the applicant achieves the highest practical standard within the regulatory framework... Standards generally tend to erode, rather than improve, after approval is granted. The principal aim when assessing applications should be to ensure that the applicant achieves the highest possible standard before approval is granted. A firm but tactful insistence on the required standard for the facilities, equipment, technical data and qualified personnel should be applied. The purpose of the assessment is to ensure that the applicant's facilities, including mobile facilities, equipment and resources are suitable for carrying out those activities to which the application relates." Section 3.1.2 of the COA Procedures Manual.outlines the scope of the assessment process and requires the inspector to: .Obtain and review any CASA records relating to the applicant's history .Peruse documents submitted .Become aware of any mandatory requirements applicable to the applicant's activities .Perform an assessment of the applicant's: 0 Facilities and resources 0 Data and documentation 0 Tools and equipment 0 Premises 0 System of certification, .Interview appropriate persons, and: Also consider the applicant organisation's airworthiness control and the ability to: .Implement the requirements of Airworthiness Directives, modifications and special inspections .Schedule maintenance tasks .Report service difficulties .Authorise personnel for maintenance, training and certification tasks .Review technical instructions .Carry out all repairs and modifications to approved specifications .Control contractors. Clearly, the COA Procedures Manual requires the assessing inspector to apply discretionary powers to ensure that the highest standards are applied when performing an assessment for initial issue of a Certificate of Approval. Although no specific requirements appears to exist with regard to assessing whether an organisation has adequate personnel, the assessing inspector is required to apply his discretionary powers. The periodic inspections performed by Compliance staff are used to assess such matters on an ongoing basis, and are reported on a six monthly cycle using the Safety Trend Indicator (STI) form. Similarly, no process seems to be evident in identifying priority areas in entry control. Rather, all areas are required to be at the highest standard prior to approval. The assessing inspector is required to consider the applicant airworthiness control and consider his ability to implement the requirements of Airworthiness Directives, modifications and special inspections. The entry control process procedures are written to ensure that the assessing inspector uses his discretionary powers to ensure compliance at the highest possible level from the time of certificate issue. CASA then relies on regular surveillance and compliance action to ensure that these standards are maintained. Additionally the legislation firmly places the responsibility of ensuring that maintenance, including Airworthiness Directives, on the Certificate of Registration (CoR) holder. The Licenced Aircraft Maintenance Engineer (LAME) or Certificate of Approval (CoA) holder is responsible for ensuring that the maintenance is correctly performed and certified. C In addition to the information provided above, I am advised that Chapters 4.11 and 5.2 of the Surveillance Procedures Manual (SPM), provides guidance to staff on identifying priority areas when scoping surveillance tasks. Furthermore, the CASA Airline Operations Branch has drafted guidance material for inspectors that allows them to identify priority areas from audit findings in the form of the CGI Handbook. Additionally, Compliance
In addition to the information provided in CASA's response to recommendation R20040066, it should be noted that civil aviation legislation does not prescribe how many staff any organisation should employ within their organisation. The number of personnel each organisation should have is the responsibility of the certificate holder and dependent upon the individual management experience, type of work, processes involved, and the certification required. To make a successful determination as to whether an organisation has adequate personnel resources (both in terms of competency and numbers), CASA relies primarily on the experience of the Inspector who conducts the audit and audit findings. Inspectors have extensive experience in a number of organisations and are therefore the most qualified to determine whether an organisation has adequate staff.
CASA has reviewed this recommendation and considers it to be unrealistic given the large number of aircraft types involved and the sometimes unique characteristics and procedures associated with each type of aircraft. Plus There are a number of publications currently available dealing with multi-engine training and the factors to be considered by operators when developing procedures for responding to emergencies. In addition, operators are required to produce appropriate procedures manuals that are reviewed by
The training syllabus for the initial issue of a multi-engine aeroplane endorsement is currently published by CASA in Civil Aviation Advisory Publication (CAAP) 5.23-1. It describes in detail the course of flight and ground training, which candidates seeking their first multi-engine endorsement (rating) should undertake. The syllabus is also applicable to subsequent endorsements and provides the knowledge and training requirements that detail appropriate decision making procedures to be employed by pilots when responding to engine failures and other emergencies in multi-engine aircraft. For training in decision-making procedures, it is considered necessary to replicate as accurately as possible, the situation where an emergency could take place. In Australia, synthetic training devices for this class of aircraft are typically generic in nature and are seen as a useful aid in the training of emergency procedures. However, due to the lack of realism, it is considered that they fail to simulate the environment sufficiently to be of benefit in this type of human factors training. It should also be noted that there is a substantial cost involved in the acquisition and operation of synthetic training devices. Assessment of human factors is currently included in all pilot licence theory examinations and an assessment is made during flight testing. With the implementation of Civil Aviation Safety Regulation (CASR) Part 61, CAS A will incorporate human factors training in the Manual of Standards (MOS) for all flight crew licences. Additionally, aspects of human factors are embedded within the MOS as 'Manage Flight' elements and provide for an assessment of the decision-making process and behaviour that must be achieved for the issue of a qualification.
CASA has drafted an Airworthiness Bulletin (AWB) to be sent to all operators of the aircraft highlighting the issue of proximity of the switch and its contact with the airframe. The AWB is currently awaiting approval and CASA undertakes to inform the ATSB when the AWB is released. ATSB Comment: On 10 February 2005 CASA issued AWB31-3 issue 1 to address the sense switch problem.

ATSB Response
Monitor
Closed-Not Accepted
Closed-Not Accepted
Closed-Partially Accepted
Closed-Not Accepted
Closed-Not Accepted
Closed-Not Accepted
Closed-Partially Accepted
Closed-Accepted

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20040091	Initial Response	13/01/2005	15/03/2005	-	Recommendation	Civil Aviation Safety Authority
R20040091	Further correspondence	13/01/2005	26/03/2008	1168	Recommendation	Civil Aviation Safety Authority
R20040097	Initial Response	21/01/2005	19/05/2005	-	Recommendation	Civil Aviation Safety Authority
R20040097	Further correspondence	21/01/2005	19/03/2008	1153	Recommendation	Civil Aviation Safety Authority
R20050002	Initial Response	15/03/2005	29/08/2005	-	Recommendation	Civil Aviation Safety Authority
R20050002	Further correspondence	15/03/2005	10/10/2007	939	Recommendation	Civil Aviation Safety Authority
R20050004	Initial Response	17/03/2005	18/07/2005	123	Recommendation	Civil Aviation Safety Authority
R20050010	Further correspondence	6/02/2006	29/05/2006	-	Recommendation	AirServices Australia
R20050010	Initial Response	6/02/2006	20/07/2006	-	Recommendation	AirServices Australia
R20050010	Further correspondence	6/02/2006	8/12/2006	305	Recommendation	AirServices Australia

Safety Finding
OPS/HF - Assessment of cardiac event risk
OPS/HF - Assessment of cardiac event risk
Danger Zone Marking and Accident Investigation Hazards with Aircraft Rocket Assisted Parachute Systems
Danger Zone Marking and Accident Investigation Hazards with Aircraft Rocket Assisted Parachute Systems
Helicopter EMS operations
Helicopter EMS operations
CS - The use of overwing slides during brake fire evacuations
Application of separation in procedural air traffic control towers
Application of separation in procedural air traffic control towers
Application of separation in procedural air traffic control towers

Safety Issue
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the medical certification standards to consider the potential increased significance of diastolic blood pressure to the risk of a cardiac event in applicants for an aviation medical certificate.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the medical certification standards to consider the potential increased significance of diastolic blood pressure to the risk of a cardiac event in applicants for an aviation medical certificate.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority publish guidance alerting all personnel who would normally attend an accident site to the dangers associated with aircraft equipped with rocket-assisted recovery parachute systems.
The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority publish guidance alerting all personnel who would normally attend an accident site to the dangers associated with aircraft equipped with rocket-assisted recovery parachute systems.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review it's operators classification and/or it's minimum safety standards required for helicopter Emergency Medical Services operations. This review should consider increasing; (1) the minimum pilot qualifications, experience and recency requirements, (2) operational procedures and (3) minimum equipment for conduct of such operations at night. During consultation during the directly involved parties process regarding issues related to this recommendation, CASA indicated that it would act to: * Review the requirements for helicopter EMS operations to include consideration for two pilots, or a stability augmentation and/or autopilot system * Review the special operational and environmental circumstances of helicopter EMS services, particularly with regard to pilot qualifications, training and recency including instrument flight competency * Review the pilot recency requirements for helicopter EMS operations to ensure that operator check and training processes are focused on the EMS environment. The Australian Transport Safety Bureau is continuing to monitor CASA's progress concerning these issues.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review it's operators classification and/or it's minimum safety standards required for helicopter Emergency Medical Services operations. This review should consider increasing; (1) the minimum pilot qualifications, experience and recency requirements, (2) operational procedures and (3) minimum equipment for conduct of such operations at night. During consultation during the directly involved parties process regarding issues related to this recommendation, CASA indicated that it would act to: * Review the requirements for helicopter EMS operations to include consideration for two pilots, or a stability augmentation and/or autopilot system * Review the special operational and environmental circumstances of helicopter EMS services, particularly with regard to pilot qualifications, training and recency including instrument flight competency * Review the pilot recency requirements for helicopter EMS operations to ensure that operator check and training processes are focused on the EMS environment. The Australian Transport Safety Bureau is continuing to monitor CASA's progress concerning these issues.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Bureau, review the adequacy of operator procedures for the deployment of over-wing slides during known brake fire situations. This review should take into consideration the visual cues used and potential risk to passengers of evacuating within close proximity of a fire zone
The Australian Transport Safety Bureau recommends that Airservices Australia review MATS 4.5.2.2 to ensure that separation between aircraft, established `by the use of visual observation of aircraft position and projected flight paths', is more clearly defined and consistently applied.
The Australian Transport Safety Bureau recommends that Airservices Australia review MATS 4.5.2.2 to ensure that separation between aircraft, established `by the use of visual observation of aircraft position and projected flight paths', is more clearly defined and consistently applied.
The Australian Transport Safety Bureau recommends that Airservices Australia review MATS 4.5.2.2 to ensure that separation between aircraft, established `by the use of visual observation of aircraft position and projected flight paths', is more clearly defined and consistently applied.

Organisation Response
CASA has been applying a cardio risk screening tool for almost ten years, which is based on internationally recognised research and provides an appropriate balance in assessing risk factors. There are a range of diagnostic tools that provide an indicative measure of possible cardiac events including body mass index and other factors. While there are risks associated with all screening methods, these need to be balanced against the false positive results found in the screening procedures. The Authority will ensure that its medial [sic] certification assessment process remains consistent with current medical best practice and will continue to monitor research into the medical significance of diastolic blood pressure to the risk of a cardiac event. CASA is also in the process of establishing a review of the literature relating to this subject. The results of the review will determine whether CASA changes its current screening tool. ATSB Note: As at 26 March 2008, no further advice had been received from CASA on their review and any consequent changes to its screening tool. The ATSB reclassifies the recommendation as Closed - Partially Accepted
ATSB Note: As at 26 March 2008, no further advice had been received from CASA on their review and any consequent changes to its screening tool. The ATSB reclassifies the recommendation as Closed - Partially Accepted
The following response was received from the Civil Aviation Safety Authority on 19 May 2005: Thank you for providing the Civil Aviation Safety Authority (CASA) with a copy of Air Safety Recommendation R20040097 in relation to light aircraft rocket-assisted recovery parachute systems. In response to recommendation R20040097, I am advised that in addition to its earlier advice, CASA is currently reviewing the ATSB's recommendation to publish guidance material on this issue. However, I understand that a project involving a number of areas within CASA would need to be undertaken before a commitment to produce any guidance material can be provided. Additionally, I am advised that due to the number of activities currently being undertaken by CASA, work on this project may not commence until July 2005. In the interim, it should be noted that CASA's aerodrome inspectors have communicated their concerns regarding these devices to aerodrome operators who are able to bring this issue to the attention of their Aerodrome Emergency Committee. Safety information from BRS Inc, one of the manufacturer's of the recovery parachute systems, was also provided to operators for their consideration. I am advised that CASA also passed information on to the Aerodrome Rescue and Fire-Fighting Service (ARFFS), who I understand have now included material dedicated to these devices in their training manual.
The following response was received from the Civil Aviation Safety Authority on 8 September 2006: I refer to your e-mail dated 27 July 2006 requesting an update on the response by the Civil Aviation Safety Authority (CASA) to the Australian Transport Safety Bureau's (ATSB) Air Safety Recommendation R20040097 in relation to light aircraft rocket assisted parachute recovery systems. I apologise for the delay in responding. CASA is considering the issues relating to appropriate warning markings on aircraft carrying this type of equipment, especially in the absence of an agreed international standard. A decision has yet to be made as to whether advising the aviation community of the potential hazards should be done through a Civil Aviation Advisory Publication of through drawing their attention to safety resources produced by the manufacturer. In considering these issues CASA must also take into account the fact that it has a limited regulatory role after accidents and has already taken a number of steps to alert Aerodrome Rescue and Fire Fighting Services of this problem, as advised in CASA's letter to the ATSB of 19 May 2005. ATSB Comment: The response was initially classified as Monitor. On 20 March 2008, the ATSB re-classified the response as Closed - Partially Accepted.
CASA has reviewed its previous advice in relation to this matter [provided with the directly involved parties comments to draft occurrence report 200304282] and I am advised that the Authority has no additional comment to provide in response to recommendation R20050002. However, it should be noted that resources to review this action will be allocated in accordance with CASA's reviewed priorities. For your information, a copy of CASA's initial advice is recorded below. CASA advice CASA will: * Review the requirements for helicopter EMS operations to include consideration for two pilots, or a stability augmentation and/or autopilot system; * Review the special operational and environmental circumstances of helicopter EMS services, particularly with regard to pilot qualifications, training and recency including instrument flight competency; and * Review the pilot recency requirements for helicopter EMS operations to ensure that operator check and training processes are focused on the EMS environment.
The following updates the actions previously advised in response to the recommendation: Dot point 1: The proposed review of EMS operation crewing and aircraft equipment requirements will take place as part of the re-instated project to finalise Civil Aviation Safety Regulation (CASR) Part 133. As you may be aware, the regulatory review aspects of CASR Part 133 have, under instruction from the CASA CEO [deleted], been on hold for some time. However I can now advise that this project is scheduled to recommence in October 2007, and that this subject matter will be incorporated in the consideration of CASR 1998 Part 133.T.3. Dot point 2: CASA has been considering these issues (particularly the special operational and environmental circumstances associated with EMS operations) for some time now as part of the review processes for the introduction of Night Vision Goggles (NVG) into Australian helicopter night operations. As a result of this review we have incorporated helicopter EMS operations as a Permitted NVG Operation in the new NVG Civil Aviation Order (CAO) 82.6. This CAO (which is now in effect) empowers appropriately equipped, trained and approved EMS AOC holders to use NVG on their night EMS primary and secondary response taskings. Both CASA and the industry consider this to be a major safety initiative and we will be monitoring its effect over the next twelve months by way of a formal research process. Dot point 3: EMS pilot qualifications, training and recency requirements will be included in the CASR Part 133 project consultation and review processes, however I can also advise the (as part of its normal surveillance processes) CASA will continue to review these matters in current operations as well. Additionally I can advise that pilot qualification, training and recency requirements were also reviewed by both CASA and the industry as part of the consultation processes associated with the previously mentioned NVG implementation project, and that the industry subject matter experts at these meetings included several representatives from AOC holders who conduct EMS operations in both VFR and IFR situations at diverse operational locations. Summary: Overall our surveillance indicate a general trend of maturation in the EMS operators within the Australian operational environment with new contracts being let, more advanced helicopters being purchased, and many former single engine turbine operations now also including multi engine/IFR aircraft in their fleet. We also note operators tending to use their single engine aircraft for day operations, or as a stand by aircraft to cover unserviceability, rather than as the primary response aircraft, and whilst this is not the case in all circumstances, it does show an enhanced awareness of these matters is also occurring within EMS operators in general.
CASA considers that the company procedures and actions of the crew in this accident to be appropriate. It is universal practice that crew check for fire outside before deploying slides. This was not only carried out, but in the case of L3 the crewmember asked a passenger to check the lower section of the slide before the crew member initiated evacuation instructions. Given that there was no control by crew members of passengers once evacuated, until the crew members themselves evacuated, there would in fact be nothing to prevent passengers evacuated from a forward or aft slide entering the landing gear area. Many operators, both within Australia and internationally, provide the Pilot in Command (PIC) with two options to facilitate the rapid removal of passengers, Such options allow the PIC to consider the degree of urgency required in evacuating passengers from the aircraft, while accepting that, during an evacuation, personal injuries may occur in the rapid use of evacuation slides. Option one, the `Precautionary Disembarkation,' provides for a more orderly rapid evacuation of passengers in situations such as bomb threats. In these circumstances, passengers are required to be removed from the aircraft quickly although in a somewhat orderly way, to minimize risk of personal injury. The Precautionary Disembarkation also allows the PIC to nominate, if necessary, which slides/stairs/aerobridge to use, depending upon the specific situation/emergency, The second option relates to full scale evacuations whereby all available doors/escapes slides are to be used with the only priority being passengers and crew leaving the aircraft as quickly as possible. This overriding priority has been re-enforced as a result of numerous aircraft accidents where passengers have survived the impact, only to be overcome by smoke and fumes. Further, integral to cabin crew evacuation procedures and training, is the requirement for each crewmember to conduct an outdoor inspection of their respective exit prior to opening. This inspection will determine if there are any hazards, for example fire/excessive smoke/water or obstructions. Should such a hazard exist, the exit may remain closed and passengers will be re-directed to a useable doorlslide. In this particular accident, assuming the cabin crew at the over-wing exit followed their procedures as required and checked outside conditions prior to opening the over-wing doors, they may well have determined that it was safe to operate these exits and evacuate passengers down the off-wing slides. Had the gear fire been more intensive and smoke and/or flames were evident, then the crew would not have opened these exits, and instead, re-directed passengers to exits clear of the wings, The Pilot in Command, once the evacuation order is given, relies entirely on the judgment of the cabin crew at their specific doors as to the usability or otherwise of that exit. Additionally, if the PIC has determined that an evacuation is necessary, he/she has also concluded that the time available to get all onboard off the aircraft is the overriding critical factor. Based on the available information, it would
Airservices Australia advised that a working paper discussing visual separation procedures had been developed.Airservices will advise any subsequent action in relation to Manual of Air Traffic Services amendments.
Airservices Australia is reviewing MATS 4.5.2.2.
Airservices Australia advised that a Manual of Air Traffic Services (MATS)/Aeronautical Information Publication (AIP) request for change (RFC) had been issued 2 December 2006. The rules in MATS regarding visual separation can be misinterpreted and in some circumstances separation is not assured. The intention of the RFC is to: - clarify the application of visual separation and specifically the use of projected flight paths - restructure the visual separation rules to differentiate visual separation by the pilot and the controller - clarify when traffic information needs to be passed - include the use of surveillance systems in identifying aircraft prior to the application of visual separation. The change is planned to be implemented 15 March 2007.

ATSB Response
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Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20050011	Initial Response	6/02/2006	20/07/2006	164	Recommendation	AirServices Australia
R20050013	Initial Response	23/12/2005	23/02/2006	-	Recommendation	Civil Aviation Safety Authority
R20050013	Further correspondence	23/12/2005	5/07/2006	194	Recommendation	Civil Aviation Safety Authority
R20050014	Initial Response	23/12/2005	6/03/2006	73	Recommendation	Civil Aviation Safety Authority
R20060002	Initial Response	20/01/2006	6/04/2006	76	Recommendation	Civil Aviation Safety Authority
R20060003	Initial Response	20/01/2006	6/04/2006	-	Recommendation	Civil Aviation Safety Authority
R20060003	Further correspondence	20/01/2006	16/08/2006	208	Recommendation	Civil Aviation Safety Authority
R20060004	Initial Response	2/02/2006	11/05/2006	-	Recommendation	Civil Aviation Safety Authority
R20060004	Further correspondence	2/02/2006	17/07/2007	-	Recommendation	Civil Aviation Safety Authority
R20060004	Further correspondence	2/02/2006	10/09/2007	-	Recommendation	Civil Aviation Safety Authority
R20060004	Further correspondence	2/02/2006	20/12/2007	686	Recommendation	Civil Aviation Safety Authority
R20060008	Initial Response	8/03/2006	16/08/2006	161	Recommendation	Civil Aviation Safety Authority
R20060010	Initial Response	1/05/2006	31/05/2006	30	Recommendation	Civil Aviation Safety Authority
R20060013	Initial Response	1/05/2006	16/08/2006	107	Recommendation	Civil Aviation Safety Authority
R20060018	Initial Response	3/10/2006	8/12/2006	66	Recommendation	AirServices Australia
R20060019	Initial Response	16/12/2006	26/03/2007	100	Recommendation	Civil Aviation Safety Authority

Safety Finding
Application of separation in procedural air traffic control towers
Fuel probe high impedance wiring chafing
Fuel probe high impedance wiring chafing
BK 117 Maintenance Manual Discrepancy
Procedures relating to instrument approaches for aircraft engaged in scheduled air transport operations
Procedures relating to instrument approaches for aircraft engaged in scheduled air transport operations
Procedures relating to instrument approaches for aircraft engaged in scheduled air transport operations
ENG Flight Recorders
ENG Flight Recorders
ENG Flight Recorders
ENG Flight Recorders
OPS - Terrain Awareness Warning Systems - Turbine Powered Aircraft
Recommendations - Collision with terrain - Mt Hotham, Vic - 8 July 2005
Recommendations - Collision with terrain - Mt Hotham, Vic - 8 July 2005
ATS - Provision of aerodrome traffic information
OPS - GNSS / RNAV Safety Survey

Safety Issue
The Australian Transport Safety Bureau recommends that Airservices Australia ensure that controllers are aware of the importance of the separation assurance provisions of MATS 4.1.1.4, particularly in the application of procedural separation.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority alert operators and review the continuing airworthiness of all Australian registered Fairchild Industries SA227 model aircraft, or other aircraft model types using fuel immersed capacitance-type fuel sensors (probes), with specific regard to possible high impedance wire chafing within the fuel tank.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority alert operators and review the continuing airworthiness of all Australian registered Fairchild Industries SA227 model aircraft, or other aircraft model types using fuel immersed capacitance-type fuel sensors (probes), with specific regard to possible high impedance wire chafing within the fuel tank.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority alert Australian operators of Kawasaki BK117 B-2 helicopter to the discrepancy with respect to the procedure for adjusting the collective pitch settings in the maintenance manual.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review and clarify the legal requirements concerning the qualifications for two-crew (pilot) operation during the conduct of instrument approaches in air transport operations. The review should assess the safety benefit arising from ensuring that when an instrument approach is conducted in an aircraft required to be operated by a two-person flight crew, both flight crew members are qualified to conduct the type of approach being carried out.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of current legislation and regulation and: * to assess the safety benefit that could be achieved from the fitment of a serviceable autopilot to all aircraft currently on the Australian civil aircraft register, engaged on scheduled air transport operations * with a view to ensuring that all aircraft placed on the Australian civil aircraft register after a specified date and intended to be engaged on scheduled air transport operations are equipped with a serviceable autopilot.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the adequacy of current legislation and regulation and: * to assess the safety benefit that could be achieved from the fitment of a serviceable autopilot to all aircraft currently on the Australian civil aircraft register, engaged on scheduled air transport operations * with a view to ensuring that all aircraft placed on the Australian civil aircraft register after a specified date and intended to be engaged on scheduled air transport operations are equipped with a serviceable autopilot.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority (CASA), review the requirements for the carriage of on-board recording devices in Australian registered aircraft as a consequence of technological developments.
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The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority (CASA), review the requirements for the carriage of on-board recording devices in Australian registered aircraft as a consequence of technological developments.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the requirements for Terrain Awareness Warning Systems for Australian registered turbine-powered aircraft below 5,700 kgs, against international standards such as ICAO Annex 6 and regulations such as FAR 91.223, with the aim of reducing the potential for CFIT accidents. The Civil Aviation Safety Authority should also consider the requirements for Terrain Awareness Warning Systems for Australian registered turbine-powered helicopters against the background of the US NTSB recommendation for the fitment to turbine-powered helicopters certificated to carry six or more passenger seats.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority publish educational material, to promote greater awareness of the flat light phenomenon for pilots operating in susceptible areas.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review its surveillance methods, which may include cooperation with Airservices Australia for the detection of patterns of unsafe practices and non-compliance with regulatory requirements.
The Australian Transport Safety Bureau recommends that Airservices Australia review guidance material and training for aerodrome controllers relating to the provision of relevant traffic information, to enhance pilot situational awareness.
Pilot workload was perceived as being higher, and reported losses of situational awareness were reported as more common, for the area navigation global navigation satellite system (RNAV (GNSS)) approach than all other approaches except the non-directional beacon (NDB) approach, which involved similar workload and situational awareness levels. This was especially a concern for pilots operating Category A and Category B aircraft. The Australian Transport Safety Bureau (ATSB) recommends that the Civil Aviation Safety Authority (CASA) conduct or commission further research into pilot workload and losses of situational awareness associated with RNAV (GNSS) approaches and advise the ATSB of its findings.

Organisation Response
As a result of issues previously identified by Airservices Australia just prior to this recommendation, a number of systemic controls were introduced to ensure that controllers are aware of the importance of the separation assurance provisions of MATS 4.1.1.4. These measures included amendment to MATS 4.1.1.4 to reflect the full intent of Separation Assurance, the development and delivery of a refresher training module on separation assurance, and the inclusion of separation assurance criteria in Performance Assessment Reports. There is no recent evidence of the existence of an ongoing systemic issue.
Following an investigation into the occurrence, and a review of the ATSB recommendation, CASA supplied the results of that investigation and review to the ATSB. A summary of those findings are included below: `Interim Decision Following the preliminary review of data available the decision was made not to ground the Australian fleet on the following basis: * No Previous history of defects/incidents over a significant time. * The FQIS [fuel quantity indicating system] is a low power system, current limited [0.2 amperes according to the manufacturer, which was equal to 3.2 watts] to minimise the possibility of a spark of sufficient energy to ignite the fuel being allowed to form in the event of a short circuit. * The abrasion and arcing had occurred at some time, the evidence indicated that it occurred at very low power but there was no indication whether it was an old event, recent or ongoing. * The down time for operators would be significant in that all ten probes would have to be removed (inspection in situ is not possible). Reinstallation would require resealing (and associated cure time) and possible recalibration of the fuel system. Estimated total down time would be 48 hours. Conclusion Considering the age of the aircraft and the uncertain maintenance regime that existed for the majority of its operational life causal factors that may have contributed to this defect are numerous, as an example: * Orientation of the probe in the fuel tank and the subsequent susceptibility to wire deflection due to fuel surge during refuelling or aircraft manoeuvring. * Deflection of wiring during the aircraft incident. * Operation of the aircraft in a high vibration condition eg out of balance propeller, extended ground taxi. * Resonant airframe vibration. There is no indication as to whether this is an old defect, recent failure or a continuing issue. No evidence exists that would indicate a fleet trend. From the data available, I agree with the finding of the TC [type certificate] holder in that this is an isolated incident. Whilst the potential for fire is always present when an ignition source and a volatile fuel are brought together, there is minimal risk that the arcing that occurred could cause a fire in the aircraft considering the low power and the high flash point of the Jet A1 fuel in use. Recommendation An Airworthiness Bulletin is to be issued recommending greater scrutiny of the FQIS, particularly the fuel quantity probes, during scheduled and unscheduled maintenance. Operators will be encouraged to report any anomalies found in an attempt to identify possible trends. This would include verification of
As a result of further communications with the Civil Aviation Safety Authority (CASA) on the issue following notification of another fuel probe from a different aircraft displaying the same anomaly, CASA conducted a review to further examine the issue. It provided the Bureau with an extensive report detailing the review. The conclusion of the report stated: 'Following the review CASA maintains that: 1. CASA's original findings are valid. 2. The risk of fuel tank explosions due to electrical shorting of the fuel probes in the SA227 is negligible. 3. The Metroliner SA227 is not covered by SFAR [Special Federal Aviation Regulation] 88 or recent amendments to FAR [Federal Aviation Regulation] 25 issued by the FAA [US Federal Aviation Administration]. 4. The SDR [Service Difficulty Report] records on this defect needs to be reviewed in light of conflicting anecdotal evidence to the contrary.' The review also included proposed actions to revise Airworthiness Bulletin 28-1 to better represent fuel related hazards and to develop and publish additional educational
On 22 December 2006, CASA wrote to all Kawasaki BK117 B-2 owners and operators and recommended that pending advice from the manufacturer, Australian operators of the BK 117 B-2 should: > reduce expose to conditions of high density altitude and atmospheric turbulence, especially if the aircraft is at high-gross weight; and > if such conditions are encountered, reduce airspeed and torque settings while hand flying the aircraft with SAS mode engaged. In addition to this advice, CASA provided owners and operators with an overview of the incident involving VH-IME, which occurred on 7 December 2005 (occurrence 200506614). The Authority's correspondence also noted that according to the ATSB report, Kawasaki Heavy Industries would amend the BK 117 B-2 maintenance manual.
The Civil Aviation Safety Authority advised the ATSB on 3 April 2006 that it has amended Civil Aviation Order 40.2.1, Instrument Ratings, to clarify the requirement for all instrument rating holders to hold an endorsement for any navigation aid being used to navigate an aircraft (including instrument approaches of which they are a crew member. The amendment does, however, provide an exemption for co-pilot crew members who do not hold an endorsement but have received equivalent training and demonstrated proficiency in the use of the navigation aid while participating in an operator's cyclic training and proficiency programme. The amendment became effective on 25 March 2006.
The Civil Aviation Safety Authority advised the ATSB on 3 April 2006 that it is currently reviewing Civil Aviation Order (CAO) 20.18 and examining the history of changes as they relate to the fitment of autopilot equipment. Additionally, a review of international legislation (JAR, FAA, Transport Canada and NZ) is being undertaken in order to determine whether or not Australia's requirements are out of step with best practice.CASA is also working to identify the 'population' of RPT Operators and aircraft that are affected, by this recommendation, looking particularly at which of those aircraft are NOT fitted with an autopilot that satisfies CAO 20.18 Para 4.1A.
CASA has conducted a preliminary review of Civil Aviation Order (CAO) 20.18 and examined the history of changes as they relate to fitment of autopilot equipment. The relevant current provisions in CAO 20.18 have existed since about 1960 and are consistent with current provisions of the US Federal Aviation Administration (FAA) and the European Joint Aviation Authorities (JAA). A review of CASA data to identify the 'population' of RPT Operators and aircraft that are affected revealed a total of 52 aircraft, 80% of which are the Metro SA227. Some feedback indicates that the standard autopilot approved for this aircraft type is widely known within the aviation industry to be unreliable old technology and expensive. This may account for the fact that few Metro SA227 aircraft are fitted with autopilots. All Australian aircraft operating in high capacity regular public transport operations have approved autopilots fitted. CASA will consult industry through the Standards Consultative Committee (SCC) before deriving a conclusion on the matter. Furthermore, CASA has extracted relevant Crew Resource Management/training and Human Factors material out of draft Civil Aviation Safety Regulation Part 121A and is developing a Civil Aviation Advisory Publication. This material is currently with CASA senior
The Civil Aviation Safety Authority will analyse the cost benefit of the recommendation regarding the carriage of on-board recording devices to this type of operation.
On the issue of on board recording devices, this is a cost and maintenance burden with existing equipment. Low cost/new technology units are not currently available. CASA will continue to monitor this.
In reference to ATSB Recommendation R20060004 (issued following the Benalla accident) page 34 of the draft report [relating to 200502662]: The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority (CASA) review the requirements r the carriage of on-board recording devices in Australian registered aircraft as a consequence of technical developments. As you are aware, on 11May 2006 CASA advised of an intention to conduct a cost/benefit analysis of the recommendation regarding the carriage of on-board recording devices to this type of operation. I understand that CASA has previously investigated this matter and, based on the equipment available at the time, could not justify mandating carriage of recording devices on low capacity aircraft. However, given other priorities, this has not yet been confirmed by way of a cost/benefit analysis. I have now directed that a cost/benefit analysis be undertaken. I expect to have a result before the end of the year and will forward the results to
I refer to the letter dated 11 October 2007 from the Deputy Director, Information and Investigations to General Manager, Corporate Relations[CASA], enclosing an advance copy of amended Transport Safety Investigation Report on the fatal accident involving a Piper PA-31-350 aircraft registered VH?PYN, which occurred near Condobolin, New South Wales on 2 December 2006. The draft Cost Benefit Analysis for on-board recording devices will be completed by the end of this week [21 Dec 2007]. Consideration of this is to be completed and CASA will write to you again by the end of January 2008.
CASA accepts the recommendation and will take the following action: CASA will consider various aspects in relation to the fitment of Terrain Awareness Warning Systems for Australian registered turbine-powered aircraft below 5700 kgs, including: cost benefit analysis of costs to industry; how fitment would improve safety in this class of aircraft; CASA policy on fare paying passengers; impact on freight operators; training in the use of the equipment; and the lead time required prior to fitment.
The May/June issue of the Civil Aviation Safety Authority's Flight Safety Australia included an article on the accident that noted the flat light phenomena.
CASA has recently completed a review of its surveillance methods, particularly in the General Aviation environment. This has resulted in some changes to planning methodology, some modifications to surveillance activities and increased use of risk based methodology. Procedures are also being established to improve the communication channels between CASA and Airservices Australia, to facilitate the provision between the organisations of relevant information.
Airservices Australia advised that a Manual of Air Traffic Services (MATS)/Aeronautical Information Publication (AIP) request for change (RFC) had been issued 2 December 2006. The rules in MATS regarding visual separation can be misinterpreted and in some circumstances separation is not assured. The intention of the RFC is to: - clarify the application of visual separation and specifically the use of projected flight paths - restructure the visual separation rules to differentiate visual separation by the pilot and the controller - clarify when traffic information needs to be passed - include the use of surveillance systems in identifying aircraft prior to the application of visual separation. The change is planned to be implemented 15 March 2007.
06/03/2007 In respect of recommendation R20060019, CASA will have the findings of the report considered by the Australian Strategic Air Traffic Management Group (ASTRA), consult with regulators overseas and review research findings from other studies (particularly a recent one by Leeds University in the UK). It would be helpful, however if the ATSB would provide further clarification on the additional research that it recommends be undertaken into pilot workload (especially given the low response rate and limited available data cited in the present study). 26/03/2007 In regard to R20060019, CASA will continue to monitor developments in this area, particularly in the United Kingdom. To this end, CASA will be meeting staff of the UK CAA shortly to discuss recent work done by them on RNAV (GNSS) approaches. The issues raised in your report have also been raised at the recent ICAO Navigation Systems Panel. At the present time, however, it is unlikely that CASA will be in a position to commission specific research, either from universities

ATSB Response
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Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
R20060021	Initial Response	16/12/2006	27/05/2007	162	Recommendation	AirServices Australia
R20060023	Initial Response	16/12/2006	30/11/2007	349	Recommendation	AirServices Australia
R20060024	Initial Response	16/12/2006	6/03/2007	80	Recommendation	Civil Aviation Safety Authority
R20070013	Initial Response	3/08/2007	11/02/2010	923	Safety Recommendation	Civil Aviation Safety Authority
R20070014	Initial Response	3/08/2007	23/09/2008	417	Safety Recommendation	Civil Aviation Safety Authority
R20070024	Initial Response	9/10/2007	29/01/2008	112	Recommendation	Civil Aviation Safety Authority
R20070025	Initial Response	22/10/2007	22/12/2007	61	Recommendation	Civil Aviation Safety Authority
R20070026	Initial Response	22/10/2007	21/12/2007	60	Recommendation	AirServices Australia
R20070030	Initial Response	30/10/2007	13/03/2008	135	Recommendation	Civil Aviation Safety Authority
R20070031	Initial Response	30/10/2007	13/03/2008	135	Recommendation	Civil Aviation Safety Authority
R20070032	Initial Response	30/10/2007	13/03/2008	135	Recommendation	Civil Aviation Safety Authority
SAN20000278	Initial Response	27/02/2001	23/03/2001	24	Safety Advisory Notice	Civil Aviation Safety Authority

Safety Finding
OPS - GNSS / RNAV Safety Survey
OPS - GNSS / RNAV Safety Survey
OPS - GNSS / RNAV Safety Survey
Reg requirements - defined low-flying areas
Low-flying guidance
ENG-EDD events in P&W PT-6 engines
ATC/OPS In flight provision of weather information.
ATC/OPS In flight provision of weather information.
Safety issues related to the operation of Sports Parachuting Aircraft
Safety issues related to the operation of Sports Parachuting Aircraft
Safety issues related to the operation of Sports Parachuting Aircraft
DME-700 Overheating/ Smoke in the Cockpit

Safety Issue
The 21.5% of Australian area navigation global navigation satellite system (RNAV (GNSS)) approaches with short and irregular segment distances, and/or multiple minimum segment altitude steps (necessary for approaches in the vicinity of high terrain) were identified by pilots as a major concern for many pilots. The Australian Transport Safety Bureau (ATSB) recommends that Airservices Australia review the approach design of the 21.5% of RNAV (GNSS) approaches that involve some deviations from the optimum design parameters (segments less than 5 NM and/or multiple steps within segments) to determine whether designs closer to the optimum approach profile could be developed, within the ICAO Pans-Ops limitations, and advise the ATSB of its findings.
Late notice of clearance by air traffic control to conduct an RNAV (GNSS) approach was identified as the most common difficult external condition to operate an RNAV (GNSS) approach, especially from high capacity airliner pilots. The Australian Transport Safety Bureau (ATSB) recommends that Airservices Australia, in conjunction with the Civil Aviation Safety Authority (CASA), examine opportunities to improve training and/or procedures for air traffic controller to help ensure timely approach clearances and advise the ATSB of its findings.
Late notice of clearance by air traffic control to conduct an RNAV (GNSS) approach was identified as the most common difficult external condition to operate an RNAV (GNSS) approach, especially from high capacity airliner pilots. The Australian Transport Safety Bureau (ATSB) recommends that the Civil Aviation Safety Authority (CASA), in conjunction with Airservices Australia, examine opportunities to improve training and/or procedures for pilots to help ensure timely approach clearances and advise the ATSB of its findings.
R20070013 The requirements of Civil Aviation Regulation (CAR) 157 and the operators Approval to conduct Low Flying Instrument did not include any requirement to specifically define the area in which the low flying was carried out. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
R20070014 There was no permanent, widely-available source of contemporary low-flying knowledge and information for access by student and qualified pilots, operators, or by bodies and agencies contemplating or engaged in contracting for the supply of low-level aerial services. The ATSB recommends that the Civil Aviation Safety Authority should address this safety issue.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider the benefits of requiring the fitment of AGB chip detectors on all Australian registered Cessna 208 aircraft used in commercial passenger operations.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in consultation with Airservices Australia, review the requirements for the dissemination of SIGMET information with a view to minimising differences between air traffic control procedures contained in the Aeronautical Information Publication and those contained in ICAO Doc.4444 and ICAO Doc.7030.
The Australian Transport Safety Bureau recommends that Airservices Australia, in consultation with the Civil Aviation Safety Authority, review the requirements for the dissemination of SIGMET information with a view to minimising differences between air traffic control procedures contained in the Aeronautical Information Publication and those contained in ICAO Doc.4444 and ICAO Doc.7030.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review Civil Aviation Advisory Publication (CAAP) 42B-1(0) and Airworthiness Bulletin AWB 02-003 Issue 2, in order to clearly define the required inspection intervals affecting Private category aircraft airframe items.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority advise all self-administered sports parachuting organisations (other than the Australian Parachute Federation) to include instructions in their Training Operations Manual, or equivalent, to define when tandem parachutists should be harnessed together, with a view to optimising the likelihood of parachutists successfully exiting an aircraft in the event of an aircraft emergency, including when below the safe release point.
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority direct that non-Australian Parachute Federation sports parachuting organisations conduct a review of their aircraft in order to identify and mitigate potential aircraft equipment-related crash survivability issues.
The Australian Transport Safety Bureau suggests the Civil Aviation Safety Authority take appropriate action to mandate compliance with Service Bulletins DME 700-34-10, 17, 23, 34, and 35.

Organisation Response
Regarding RNAV (GNSS) procedures in general, Airservices conducted an internal assessment of procedures in 2006 and has set up a review programme, starting this Spring, to look at those aerodromes with offset approaches and higher than optimum descent gradients to see what could be achieved more toward the optimum, especially as the RNAV (GNSS) criteria has recently changed with the latest amendment to PANS-OPS, 15 March 07. In addition to this review, Airservices will consult with CASA to explore whether the parameters procedure designers use (including segment lengths) can be further optimised and to consider pilot workload aspects of the design.
Response text from Airservices Australia received 08 Mar 2007 Airservices will liaise with CASA to determine how early the clearance for RNAV (GNSS) approaches needs to given and adjust training and/or procedures for air traffic controllers accordingly. ATSB Response Closed-accepted. Response text from Airservices Australia received 30 Nov 2007 Airservices canvassed several airlines to establish how early the clearance for RNAV (GNSS) approaches needs to given. Consequently, a notice to air traffic controllers was developed for educational purposes. This notice provided the following information for air traffic controllers. In circumstances that necessitate ATC nomination of an RNAV (GNSS) approach, early approach expectation should be provided to pilots. The preferred minimum notice is five minutes prior to top of descent. This information was also brought to the attention of the Airservices training college for the purpose of updating the basic training material. In addition, CASA were consulted on this process.
Response Text: In respect of recommendations 20060023 and 20060024, CASA is happy to work with Airservices Australia on these issues. However, CASA would appreciate further information on the type of training enhancements envisaged by the recommendations, given that 86% of those responding described the training as adequate, with 14% who described it as inadequate citing lack of practice as the cause of any problems. ATSB: CASA noted the findings of the surveyed pilot population to the questions about training for the RNAV (GNSS) approach endorsement. However, the ATSB's intention with this recommendation was to draw attention to one of the other findings, that some airline pilots identified late clearances by air traffic control (ATC) to make an RNAV (GNSS) approach caused additional time pressures during a busy phase of flight, partially due to the extensive preparation airline pilots conduct prior to these approaches. Accordingly, we made recommendation 20060023 (directed to Airservices Australia) and 20060024 (directed to CASA), asking both agencies to consider what additional training or education opportunities might exist to ensure both pilots and controllers were aware of the respective workloads of the other, so that requests for, or clearances for, an RNAV (GNSS) approach could be advised in a timely manner. Hence, CASA might like to consider what information could be provided to Airservices Australia to assist them alert air traffic controllers to the difficulties that might be imposed by late advice of an RNAV (GNSS) approach clearance. Similarly, CASA might consider what information could be provided to aircrew, particularly in relation to ATC responsibilities and workloads, that would better prepare them for the possibility of a clearance for this type of approach being issued later than desired. Further Response 26 March 2007: In respect of Recommendation 20060024, while operational practices and procedures for the provision of air traffic control are the responsibility of Airservices Australia, CASA does undertake operational surveillance of heir application. The issues of clearance delivery or changes are well known to both organisations and will continue to be reviewed. CASA well understands the value of pilot education and awareness and will continue to undertake such education with
In its response to the draft investigation report, CASA advised that low-flying approvals are given after consideration of suitable procedures in an operator's operations manual. Those procedures relate to the relevant operational task on the operator's air operator's certificate. In addition, CASA advised that, in accordance with CAO 82.0, Appendix 1, Sub-section 2.1 a Chief Pilot is required to have control of all operational matters affecting the safety of an operator's flying operations.
In its response to the draft report, CASA indicated that, in Fiscal Year 07/08, it would examine the development of pilot educational material that was specific to the conduct of low-level operations. That material would address the pilot responsibilities and threat and error management-type issues affecting the conduct of low-level operations. In addition, CASA advised that its Flight Safety Australia editorial group would consider publishing the resources available to pilots that could be expected to assist in the location of powerlines that were recorded or mapped by the various electricity authorities.
CASA responded to this proposed safety recommendation (Recommendation O) in the ATSB draft report by stating: The proposed mandatory maintenance instruction is aimed at capturing an EDD event before an engine IFSD occurs due to bearing failure. If the EDD events are captured through starter-generator shaft inspection and follow-on maintenance actions are carried out before engine failure, fitment of accessory gearbox (AGB) chip detector indication system in the cockpit may prove to be of marginal benefit, if any. The time between chip detector indication and the actual failure is known to be a few minutes. CASA maintenance instructions are an interim measure until engine or starter manufacturers assume the responsibility and address the core problem from a design point of view. CASA does not believe that the fitment of [an] AGB chip detector indication system in the cockpit will bring the safety benefits anticipated by ATSB recommendation O [R20070024]. CASA will, however, continue monitoring the effectiveness of mandatory maintenance instructions. ATSB comment: The ATSB does not accept CASA's suggestion that accessory gearbox chip detector systems are of marginal benefit. As indicated in this investigation, the accessory gear-box chip detector warning system fitted to the incident aircraft was instrumental in providing a prior warning of impending engine failure, allowing the pilot time to select a safe place to land. As such, the ATSB now formally issues the safety recommendation as R20070024. CASA subsequently responded on 29 Jan 2008: CASA's position on this issue remains unchanged, and CASA adopts its response to Recommendation O as its response to formal Recommendation R20070024.
e same recommendation was issued to Airservices Australia as R20070026. On 21/12/2007, Airservices Australia responded to the recommendation and the ATSB classified it as Closed - Accepted (see /publications/recommendations/2007/R20070026.aspx). Based on that response the ATSB classifies R20070025 as Closed - Accepted.
The following information provides an update on actions taken to address the above Safety Recommendation. Airservices' activity is occurring both internationally and domestically on this matter. We have corresponded with the Australian representative on APANPIRG and the ICAO office in Bangkok to begin research into the origin and practicality of applying the Doc 7030 two hour dissemination requirement. This research will look at possible alignment with Europe and North America. These regions do not currently specify a difference to Doc 4444 in this area. Domestically, Airservices is working with CASA with regard to the SIGMET requirement. Within Airservices we are also examining the technical and practical feasibility of identifying aircraft operating, or planning to operate in the Australian FIR, that are two hours away from a SIGMET area. In addition we are considering what also could be done to enable two hour dissemination. Depending on the outcome of these activities, Airservices will develop an appropriate roll out
CASA has no objection to the safety issue at 4.2.2 in the draft report and the recommendation. CASA is aware that this is an area that requires clarification and will pursue this further now that the final report has been released.
CASA wrote the Australian Skydiving Association on 11 December 2007 requesting that the organisation action this recommendation.
CASA wrote the Australian Skydiving Association on 11 December 2007 requesting that the organisation action this recommendation.
I have reviewed Occurrence Report 200003857, forwarded under your BO/200003857 dated 2 February 2001. The occurrence involved B767 VH-OGC, from Singapore on 6 September 2000, and occurred due to an internal failure of a DME which resulted in diversion of the aircraft to Djakarta. A copy of the related ATSB Safety Advisory Notice, SAN20000278 was requested, and forwarded to us on 9th March 2000. The SAN provides detail of the event and a related event, and corrective action developed by the equipment manufacturer. This response can be considered to also provide a response to SAN20000278. The faulty equipment is subject to TSO-C66b, requiring that all materials must be self-extinguishing. Also, the aircraft MMEL allows continued operation while one DME system is unserviceable. Rockwell Collins produced Service Bulletin (SB) DME-700-34-35 dated 18 Dec 2000 to prevent recurrences. The SB notes that other SBs must be installed prior to or in conjunction with SB DME-34-35. Rockwell Collins highly recommend that the modification be accomplished at the next shop visit. Boeing used All Operator letter L30-01-003/AOL/CAB dated 10 January 2001 to advise MD-11 operators of this SB. The views of the FAA and their response to SAN20000279 are not known at this time. Qantas is proceeding with incorporation of SB DME 700-34-35 in all affected equipment. The motivation for incorporation of the SB is partly commercial, to reduce the possibility of future diversions of large aircraft. Ansett reviewed the SB, and decided on the basis of information in the SB that incorporation of the SB was not justified. SAN20000278 proposes that a potential unsafe situation exists because the smoke and fumes that result from the equipment failure may mask other failures and predispose technical crew to complacency concerning smoke and fumes in the cockpit. The events resulted in a perceptible smoke or burning smell in the aircraft cockpit. However, the strong aversion of all aircrew to all forms of smoke or fumes in aircraft is such that this incident, which in itself was not detrimental to aircraft safety, would not deter aircrew from taking appropriate action if other smoke or fumes are detected. CASA therefore proposes to disseminate SAN20000278 after the embargo on public distribution lapses, and recommend that operators incorporate SB DME 700-34-35. Should the FAA, with greater knowledge of the aircraft, subsequently require mandatory action, CASA would consider taking further action.

ATSB Response
Closed-Accepted
Closed-Accepted
Closed-Accepted
The ATSB acknowledges the regulatory requirements affecting an operator's low-flying and other operations. However, the safety issue highlighted the potential under existing Approval to conduct Low Flying Instruments for unnecessary exposure to low-level hazards, such as powerlines, when outside the specific area in which an operational task was intended to be carried out. The ATSB action to issue a safety recommendation reflects an effort to minimise the unnecessary exposure of an aircraft and crew to low-level hazards, including powerlines, in an attempt to reduce the risk of a wirestrike.
The ATSB notes CASA's efforts to enhance pilot's understanding of the hazards affecting the conduct of low-level operations. However, the intended CASA action specifically targets pilots. It does not address the provision of a widely-available source of contemporary low-flying knowledge and information that can be accessed by bodies and agencies that might be contemplating the conduct of low-level operations. In addition, a magazine article is not considered to be a permanent source of information, could not be expected to be distributed to all prospective aerial campaign managers, and would not represent an information source that was able to be efficiently amended and configuration managed to ensure the availability of reliable, up-to-date information and guidance. The ATSB action to issue a safety recommendation is an attempt to make available for general use permanent and widely available guidance material for application by pilots, operators and prospective low-level aerial campaign managers.
Closed-Not Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Closed-Accepted
Response Not Required

Investigation	Assessed Safety Risk	Investigation Completed	Safety Issue Closed	Days between issuing and closure of safety issue	Safety Issue Addressed By	Organisation
SAN20010046	Initial Response	27/03/2001	1/05/2001	35	Safety Advisory Notice	Civil Aviation Safety Authority
SAN20010223	Initial Response	24/10/2001	12/12/2001	49	Safety Advisory Notice	Civil Aviation Safety Authority
SAN20010245	Initial Response	15/04/2002	14/05/2002	29	Safety Advisory Notice	Civil Aviation Safety Authority
SAN20020035	Initial Response	15/04/2002	14/05/2002	29	Safety Advisory Notice	Civil Aviation Safety Authority
SAN20040043	Initial Response	18/03/2004	28/05/2004	71	Safety Advisory Notice	Civil Aviation Safety Authority
SAN20040044	Initial Response	18/03/2004	28/05/2004	71	Safety Advisory Notice	Civil Aviation Safety Authority

Safety Finding
ENG-Piston Engine Component life in Commercial Operations
ENG - CESSNA PILOT SEAT STOPS
HF - Sleep inertia and wake up effects on pilot performance
HF - Sleep inertia and wake up effects on pilot performance
OPS - Risk managment and Surveillance Methodologies
OPS - Risk managment and Surveillance Methodologies

Safety Issue
The Civil Aviation Safety Authority should note the safety deficiency identified during this investigation and consider introducing methods to identify and record time in service of piston engine cylinder heads particularly for those cylinder heads utilised in passenger carrying operations.
The Civil Aviation Safety Authority note the safety deficiency identified in this report relating to single-engine Cessna aircraft seat stops and, as a matter of some urgency, alert aircraft owners, aircraft maintenance engineers and pilots to the potentially dangerous consequences of using other than the specified seat stops and to the importance of correctly locating those seat stops and ensuring that the seat pin securely engages a locating hole on the rail.
The Australian Transport Safety Bureau suggests that the Civil Aviation Safety Authority alert all aviation industry operators to the possibility of sleep inertia impairing performance, particularly that of flight and maintenance crews.
The Australian Transport Safety Bureau suggests that the Civil Aviation Safety Authority ensure that operators have strategies in place to mitigate the effects of sleep inertia as part of their fatigue management systems.
The ATSB suggests that CASA, through its industry publications, inform operators and pilots of Cherokee Six aircraft that a fuel selector control visual indication might not ensure selection of the intended fuel tank. In that case, actual fuel tank selection may be incorrect or partial, and result in the possibility for inconsistent engine fuel supply. Pilots should confirm correct visual fuel tank selection by detent feel.
The ATSB suggests that CASA, through its industry publications, should inform operators that a pilot's induction program should reflect the risks inherent in the proposed operation, and take account of the pilot's competencies, recency and proficiency relative to those risks.

Organisation Response

I refer to your Safety Advisory Notice SAN20010046 resulting from Air Safety Occurrence Report 199804715, forwarded under your BO/199804715 dated 27th March 2001. SAN20010046 states: The Civil Aviation Safety Authority should note the safety deficiency identified during this investigation and consider introducing methods to identify and record time in service of piston engine cylinder heads particularly for those utilised in passenger carrying operations. The essential corollary of recording cylinder life is that some maintenance action is placed on the cylinders. The problem of heat-induced fatigue in engine cylinders is acknowledged. The comment in the ATSB report by the engine manufacturer, Teledyne Continental Motors, that; past two engine overhaul cycles it is difficult to project future life, indicates that a safe replacement life is about two overhaul cycles. This would likely result in the replacement of cylinders at every second overhaul. As the cost of new cylinders greatly exceeds the cost of reconditioned/overhauled cylinders, the cost of implementing the proposal would be very high. If the proposal were limited to passenger carrying operations only, the cost would not be reduced significantly. VH-XAJ was conducting charter operations and most aircraft are available for charter operations. The Bureau of Transport Economics report Cost of Civil Aviation Accidents and Incidents, October 1998, estimates that the cost to society of each major injury is about $545,000 and the cost of each minor injury $205,000. The two incidents between start of 1990 and end 1999 that resulted in five serious and two minor personal injuries would therefore cost society about $3,135,000. It is estimated that the cost of implementing the proposal would be about 10 times the cost of the injuries avoided. There would also be a number of practical issues that make it difficult to implement the recommendation, including the number of engines overhauled/repaired overseas, where the organisation performing the work is often the engine manufacturer working to the requirements of the local regulatory authority. New engines would have a similar problem. A unique Australian requirement would not be easy to implement during overseas manufacture/maintenance and would be a substantial and unknown impost after the engines arrived in Australia. Implementing the SAN for cylinders currently in service would require cylinder installation and time-in-service to be recorded. Aircraft maintenance release records, aircraft logbooks, engine logbooks and component release documents would assist the development of the new record. However, establishing the record trail would often be costly, and may not be successful, resulting in situations where cylinder changes are required because the history of existing cylinders could not be determined. A number of older aircraft are fitted with engines that do not have replacement cylinders available. To life these cylinders would limit continued operation of these aircraft, adding to the cost of implementing SAN20010046. The aircraft subject to ASOR 199804715, VH-XAJ was shown in the A TSB report to be in a condition conducive to engine overheating. The engine baffles were in poor condition. The six point CHT indication system was unserviceable, the single point CHT pick-up was incorrectly installed and the CHT gauge was unreliable. These aspects may lead to cylinder failure before any reasonable cylinder replacement life. The recommendation is therefore considered to have technical merit, but it is difficult to justify on economic grounds. Furthermore, had the recommendation already been implemented, it may not
I refer to your letter of 18 October 2001 enclosing a copy of draft Aviation Occurrence Brief 200104684, concerning an accident involving Cessna 172 VH-ECT. CASA has the following comments on the report. CASA conducted a desktop audit following the accident in order to determine if there had been any regulatory breaches leading up to the accident. All documentation available to the inspectors concerning the aircraft, flying school and the particular flight appeared to be in order. Following the accident brief of VH-ECT being released on the ATSB website, CASA inspectors contacted local maintenance organisations to make them aware of the possible use of non-approved methods to secure Cessna 100/200 series seat stops. AD/Cessna/170/53/Amdt2 Issue 13/88 concerns the seat adjustment mechanism in Cessna 172 aircraft. There is a Cessna modification kit available to enable the rear stops to be moved rearwards to provide easier rear access to the aircraft. Maintenance organisations have reported that there has been evidence of the rear stops being unofficially relocated aft. It appears that the maintenance organisations are in the habit of reversing such unofficial relocations, but are not in the habit of reporting the practice to help prevent its recurrence. No problems with the forward stops were reported. CASA undertakes to provide further publicity on the problems and consequences of using other than serviceable, specified seat stops on these types of aircraft. Thank you for bringing this matter to the attention of the Authority. ATSB Note: CASA published an article "Not so Merry Go-around" in Nov-Dec 2001 edition of Flight Safety Australia.
CASA is currently preparing an Industry Information Pack to provide guidance in developing Fatigue Management Systems. CASA will take the above Safety Advisory Notices relating to sleep inertia into consideration when finalising this pack and assessing operator-proposed Fatigue Management Systems. CASA also intends to prepare an article on this topic for publication in the Flight Safety Magazine.
CASA is currently preparing an Industry Information Pack to provide guidance in developing Fatigue Management Systems. CASA will take the above Safety Advisory Notices relating to sleep inertia into consideration when finalising this pack and assessing operator-proposed Fatigue Management Systems. CASA also intends to prepare an article on this topic for publication in the Flight Safety Magazine.
The issue will be addressed during the year with articles in Flight Safety Australia (FSA) regarding fuel management practices. However, the opportunity also exists for the ATSB to write something on this matter in their section of FSA.
Within Civil Aviation Order (CAO) 82.3 there is a "check-to-line" requirement for Regular Public Transport (RPT) operations. The Order requires that all tests and checks required by the operator's approved Training and Checking Manual, must have been completed before the pilot can operate as a member of the crew. Furthermore, a check pilot must certify the pilot as being competent. An operators Training and Checking Manual is approved by CASA and therefore requires the Training and Checking organisation to reflect the risks inherent in the proposed operation, and take account of the pilot's competencies, recency and proficiency relative to those risks. Charter and aerial work operators however, do not generally have a Training and Checking Organisation (although some are required to, under Civil Aviation Regulation 217). Therefore, there is no legislated pilot induction program. However, Civil Aviation Advisory Publication (CAAP) 215 does have a recommendation for inclusion of a section in Part A of the Operations Manual (section 2.4) titled "Induction and Training requirements (unless contained in part C)". Part C is the Training and Checking Manual. CASA certainly encourages operators through our safety publications of the items noted in the recommendation. Importantly, CASA considers that this recommendation will be addressed with the introduction of Part 121 B, where training and checking will be a requirement for all transport operations.

ATSB Response
Response Not Required
Response Not Required
Response Not Required
Response Not Required
Response Not Required
Response Not Required
Response Not Required

SENATE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Inquiry into aviation accident investigations

Questions Taken on Notice –Civil Aviation Safety Authority from Public Hearing – Wednesday, 21 November 2012

Written Questions on Notice- Senator Xenophon

1. The following statement is made on page 35 of the final ATSB report:

   Five different operators were interviewed and provided relevant sections of their operations manuals for review. Those manuals generally reflected the requirements of CAAP 234-1 but also had individual operational requirements appended. However, they either had no guidance, or did not provide consistent guidance on the process to be used when deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island.

   At the 22 October hearing Mr McCormick stated:

   In the particular case of remote island operations, there are six other operators conducting aeromedical evacuation flights. After the Pel-Air ditching we audited those six. We went and looked to see what they were doing. ***None of those had an issue****. Norfolk Island has been flown to for many years, by Pel-Air as well in various iteration, without there being an issue. But it is a tricky place to fly to, I think we all agree"*

   (a) How does CASA reconcile Mr McCormick's statement with the statement in the report?

   (b) Who were the six operators audited by CASA

Australian Government

Civil Aviation Safety Authority

OFFICE OF THE DIRECTOR OF AVIATION SAFETY

1 February 2013

Senator the Hon Bill Heffernan
Chair
Senate Rural and Regional Affairs
and Transport References Committee
Parliament House
CANBERRA ACT 2600

Dear Senator Heffernan

Request for clarification of evidence

I refer to Ms Lauren Carnevale's email dated 21 December 2012 forwarding a question from Senator Xenophon seeking clarification of evidence I gave at the public hearing of the Senate Rural and Regional Affairs and Transport References Committee Inquiry into aviation accident investigations (Pel-Air) on 22 October 2012.

My answer to this question is attached. However, in the course of preparing that response, it has come to my attention that there may have been some misunderstanding in relation to my use of the term 'audit' in the relevant portion of my testimony.

At the 22 October hearing I stated:

> *In the particular case of remote island operations, there are six other operators conducting aeromedical evacuation flights. After the Pel-Air ditching we audited those six...*

My use of the term 'audit' was based on advice, provided to me at the time, that the relevant practices and documentation of each of the operators in question had been examined, with a view to the issues under discussion. Whilst the advice I was given was framed in terms indicating that 'audits' had been carried out, as reflected in my testimony, these were not full organisational audits of the kind CASA routinely carries out on all operators; nor were they correspondingly developed 'special audits' of the kind CASA undertakes on an ad hoc basis from time to time.

Rather, they involved a focused examination of the relevant manuals of operators engaged in aero-medical activities of the kind in which the Pel-Air aircraft was involved, instigated in light of the issues highlighted by the Pel-Air accident, and intended to ascertain whether there were any relevant issues or potential problems with those operations meriting further investigation and/or action on CASA's part.

CASA's examination of the subject operators' documents was appropriate in the circumstances. If my use of the word 'audit' inadvertently gave the Committee to understand that these examinations constituted formal conventional operational audits (routine or special), however, that was not the case.

I apologise for any confusion this may have caused.

Yours sincerely

John F. McCormick
Director of Aviation Safety

SENATE RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Inquiry into aviation accident investigations

Questions Taken on Notice -Civil Aviation Safety Authority from Public Hearing - Wednesday, 21 November 2012

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1. The following statement is made on page 35 of the final ATSB report:
Five different operators were interviewed and provided relevant sections of their operations manuals for review. Those manuals generally reflected the requirements of CAAP 234-1 but also had individual operational requirements appended. However, they either had no guidance, or did not provide consistent guidance on the process to be used when deciding whether to continue to a destination in circumstances similar to those affecting the flight to Norfolk Island.

At the 22 October hearing Mr McCormick stated:
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(a) How does CASA reconcile Mr McCormick's statement with the statement in the report?
(b) Who were the six operators audited by CASA.

Answer:
(a–b)
CASA considers there is no inconsistency in the statement in the ATSB report and Mr McCormick's evidence at the 22 October 2012 hearing. The ATSB report indicated that the operations manuals they examined generally reflected the material in the relevant Civil Aviation Advisory Publication (CAAP). CASA's examination of similar material from operators also found these documents were consistent with the CAAP and no regulatory issues were found.

The ATSB report found that, as a minor safety issue, the available guidance on fuel planning and on seeking and applying enroute weather updates was too general and increased the risk of inconsistent in-flight fuel management and decisions to divert. The issue had been discussed with CASA, where it was argued that the decision-making training undertaken by pilots is sufficient and that more detailed guidance may interfere with their decision-making process, considering all the variables that may apply in a dynamic environment. Whilst not amounting to what might normally be characterised as a full organisational audit, CASA conducted ad hoc examinations of relevant operations manuals to determine if there were any systemic issues of concern. Manuals examined included those of the Royal Flying Doctor Service (western and south-eastern regions), Business Aviation Solutions, Pacific Flight Services, Aerorescue and Careflight.