Submission of the Civil Aviation Safety Authority
to the Senate Standing Committee
on Rural and Regional Affairs and Transport

Inquiry into Aviation Accident Investigations (Pel-Air)

Attachment B

Memorandum of Understanding between
the Bureau of Air Safety Investigation and the Civil Aviation Safety Authority
(May 1996)

Memorandum of Understanding between
The Australian Transport Safety Bureau and the Civil Aviation Safety Authority
(June 2001)

Memorandum of Understanding between
The Australian Transport Safety Bureau and the Civil Aviation Safety Authority
(December 2004)

Memorandum of Understanding

between the

Bureau of Air Safety Investigation

and the

Civil Aviation Safety Authority

MEMORANDUM OF UNDERSTANDING BETWEEN THE BUREAU OF AIR SAFETY INVESTIGATION AND THE CIVIL AVIATION SAFETY AUTHORITY

1.0 PURPOSE

1.10 The purpose of this Memorandum of Understanding (MoU) is to outline broadly the respective roles and responsibilities of, and the relationship between, the Bureau of Air Safety Investigation (BASI) and the Civil Aviation Safety Authority (CASA).

1.11 Under the existing legislative framework each organisation has a specific role within the current tripartite aviation safety structure. CASA is the aviation safety regulator. BASI is the safety investigator. Airservices Australia is the industry service provider.

1.12 While the officers of BASI and CASA must clearly understand their own and each other's mandate, a productive relationship aimed at maintaining the highest standards of air safety can only be achieved through individual and organisational co-operation.

1.13 Within the constraints of each organisation's mandate and independent role within the aviation system BASI and CASA are committed to a constructive relationship based on co-operation.

1.14 BASI and CASA agree that from time to time this MOU will have subsidiary agreements annexed to it covering specific subjects in more detail.

1.15 Particular areas covered in this memorandum are: reporting of occurrences; conduct of investigations; preparation of reports; generation of recommendations; and, release of information, including public relations aspects.

1.16 This is the first MoU between BASI and CASA. It replaces the MoU that previously existed between BASI and the Civil Aviation Authority.

2.0 PARTIES

2.10 The parties to this memorandum of understanding are the Director of Aviation Safety (CASA) and the Director of Air Safety Investigation (BASI).

2.20 Civil Aviation Safety Authority

2.21 CASA was established under the 1995 amendments to the *Civil Aviation Act 1988* and is responsible for the safety regulation of all Australian registered civil aircraft, for foreign registered aircraft in Australian territory and for the services provided by Airservices Australia and private rescue and fire fighting service operators. Its statutory functions include setting and maintaining civil aviation standards; administering the licensing of flight crew, maintenance staff and other relevant personnel; and securing compliance with safety standards.

2.22 CASA is obliged to perform its functions in a manner consistent with Australia's responsibilities under international agreements relating to safety of air navigation, in particular the 1944 Convention on International Civil Aviation (the Chicago Convention).

2.23 One of CASA's functions is to co-operate with BASI in relation to the investigation of aircraft accidents, serious incidents, incidents and safety deficiencies.

2.30 Bureau of Air Safety Investigation

2.31 BASI is a part of the Commonwealth Department of Transport and Regional Development. Under Part 2A of the *Air Navigation Act 1920* , it is responsible for the investigation of aircraft accidents, serious incidents, incidents and safety deficiencies within the aviation system.

2.32 BASI is obliged to perform its functions in accordance with Australia's obligations under Annex 13 to the Chicago Convention. For domestic application Part 2A of the Air Navigation Act incorporates the objectives, standards and recommended practices outlined in Annex 13. Part 2A of the Air Navigation Act also gives effect to Australia's international obligations under Annex 13.

2.33 In accordance with Annex 13, section 19CA of the Air Navigation Act states that the object of BASI investigations under the Air Navigation Act is to prevent the occurrence of aircraft accidents, serious incidents, incident and safety deficiencies. The purpose of a BASI investigation is not to apportion blame or liability in relation to such occurrences or safety deficiencies.

3.0 NOTIFICATION OF OCCURRENCES

3.10 When used in this MOU, the terms, *accidents, serious incidents, incidents* and *safety deficiency* have the same meaning as defined in the Air Navigation Act.

3.11 The Air Navigation Act specifies who is required to report air safety occurrences to BASI, when they are required to be reported, and what information should be reported. There is no obligation to report safety deficiencies.

3.12 Under the Air Navigation Act, all aircraft accidents, serious incidents and incidents must be reported to BASI.

3.13 Officers of CASA are required under section 19BA(2)(b) of the Air Navigation Act to report accidents and serious incidents that *they become **directly** aware of to the Director BASI as soon as is reasonably practicable and by the quickest means possible.*

3.14 With respect to incidents, section 19BC(2) of the Air Navigation Act requires that where an officer of CASA becomes ***directly** aware of the incident (he/she) must give the Director BASI notice in writing of the incident within 48 hours after the incident.*

3.15 The parties agree all initial notifications of accidents and serious incidents reported to BASI will be reported to CASA Central Office and the appropriate CASA District Office by BASI as soon as possible.

3.16 It is also agreed that a summary of all reported accidents, serious incidents and incidents will be provided to CASA by BASI on a weekly basis.

3.17 BASI officers will, in accordance with the Civil Aviation Regulations, report to CASA any major defects discovered during the course of an investigation.

4.0 NOTIFICATION OF INVESTIGATION STATUS

4.10 The parties agree that at the time of initial notification of accidents, serious incidents, and incidents, BASI will inform CASA whether or not BASI will investigate the occurrences.

4.11 Occurrences reported to BASI are initially assessed and allocated one of five categories. In general terms, the categorisation system indicates the degree of safety value BASI believes the investigation of the occurrence is likely to yield, and what resource levels will be put into the investigations. The following information is an explanation of the occurrence categorisation system:

Category 1
Occurrences classified as category 1 are the most serious occurrences. They are perceived to present a threat to public safety or are the subject of widespread public interest. In general, accidents involving international, interstate, and regional air carriers will fall into this category. A BASI investigation normally will involve a full on-site investigation directed at the collection and analysis of all relevant facts, the issue of recommendations and the production of a final report in the ICAO-style within about 12 months. All accidents to RPT aircraft over 5700 kg which involve a fatality, in-flight collision, on-board fire or explosion or an engine or propeller tear-away will be investigated as category 1 occurrences.

Category 2
This category is assigned to those occurrences where the facts, as revealed by reported circumstances or as revealed from a preliminary investigation, indicate a reasonable concern for public safety or the potential for formal recommendation action. In general, more serious accidents which may have widespread implications for safety and incidents with significant accident potential, particularly those occurrences involving commercial passenger carrying operations, will fall into this category.

The scope and detail of a category-2 investigation are similar to those for a category-1 investigation, differing only in the size, structure and organisation of the investigation team. The final ICAO-style report, including recommendations, should be completed in less than 10 months.

Category 2 encompasses charter and RPT operations and may include serious incidents such as critical or potential airmisses, explosive decompression as well as many other occurrences.

Category 3

In most cases this category is the minimum to be allocated to fatal accidents involving VH registered aircraft (except in the case of sport aviation where category 4 may be allocated). The depth of investigation will be determined with respect to the information received. For example, if examination of the site and the aircraft, together with interviews with those involved, allow the investigator to establish a sequence of events which does not identify deficiencies with a potential for safety action, then the investigation will be concluded at that point and, depending on the circumstances, may be downgraded to a Category 4 occurrence.

Category 4

This category applies to all occurrences where the facts, as revealed by the reported circumstance, suggest neither a concern for public safety nor a serious safety deficiency.

This category usually includes non-fatal accidents and to those occurrences where there is no need for formal recommendation action, but where the circumstances are sufficiently complex to require more detailed information from the pilot or operator. The investigation, which will not normally involve an on-site phase, concentrates on capturing data for long-term trend analysis or for identifying and disseminating a worthwhile safety lesson that does not warrant formal recommendation action.

This category is limited to those occurrences where the overall circumstances are not complicated and/or the occurrence, on its own, does not warrant safety action. Category 4 is the minimum level of investigation for an accidents involving Australia-registered aircraft.

Category 5
This category is reserved for incidents where the facts, as revealed by the circumstances, clearly indicate no need for safety action by BASI. The response is directed at capturing, normally by telephone at the time of notification, sufficient data to permit long term trend analysis. A report will be prepared only in special cases.

5.0 BASI AND CASA INVESTIGATIONS

5.10 BASI and CASA both have legal powers of investigation.

5.11 The parties agree the purpose of BASI and CASA investigations will be promoted and structured so that there is a clear publicly perceived difference between them.

5.12 The primary purpose of BASI investigations is to enhance aviation safety. BASI does not use the term "cause" in its conclusions and does not follow (and is not required to follow) the legal model of causality.

5.13 One of the key concepts underpinning BASI's approach to many of its investigations is that while air safety occurrences and safety deficiencies may be considered on a case by case basis, it often serves accident prevention purposes better if they are viewed broadly as indicators of the safety health of the aviation system. This approach is referred to as Systemic Investigation. In accordance with ICAO Annex 13 recommendations, BASI approaches most major investigations on a systemic basis.

5.14 Under section 19HB of the Air Navigation Act, the Director's (BASI) powers of investigation into any matters related to an aircraft occurrence take precedence over the investigation powers of all other Commonwealth agencies with the exception of the Australian Federal Police. For practical purposes, this means that BASI will have first access to, and initial control over, all evidence including witnesses.

5.15 The parties acknowledge that BASI's primary focus is the investigation of events and circumstances that are perceived to threaten the safety of fare paying passenger operations.

5.16 In accordance with paragraph 1.17 of the appendix to Annex 13 to the Chicago Convention, BASI may make formal comment on CASA organisational and management issues and their perceived relationship to an occurrence, safety deficiency or research topic.

5.17 In broad terms, the outcomes of BASI investigations will be restricted to identifying safety deficiencies and circumstances related to an occurrence or other safety issue. Investigation reports and research reports will reflect BASI's broad aims.

5.18 Although BASI's powers of investigation take precedence over CASA's powers, the parties acknowledge that CASA may also initiate investigations of occurrences where such investigations are necessary for the purpose of assessing regulatory compliance and/or for identifying aircraft defects. The parties agree CASA's investigations will, as far as is reasonably practicable, be undertaken so as not to impede any BASI investigation. Where it is perceived by BASI that CASA activities are impeding a BASI investigation BASI will advise CASA accordingly and CASA will take action to eliminate such impediments. Where there is a dispute about CASA's activities impeding a BASI investigation the matter will be referred to the Director of Aviation Safety CASA and the Director Air Safety Investigation BASI.

5.19 CASA investigation reports will reflect the regulatory compliance and enforcement aims of CASA and will not seek to publicly identify a cause or causal sequence of events leading to an accident, serious incident or incident.

5.20 Before commencing an investigation of a safety deficiency which directly involves the operations of CASA, BASI will consult with CASA and identify the perceived safety deficiency, the scope of the investigation and the potential for mutual co-operation on the project. The parties agree that such investigations are not intended to extend to independently auditing CASA management practices. Where there is any dispute about the purpose or conduct of such an investigation, the matter will be referred to the Director of Aviation Safety CASA and the Director Air Safety Investigation BASI.

5.21 Before starting a research project that directly involves the operations of CASA, BASI will consult with CASA and identify the topic, the scope of the research and the potential for mutual co-operation on the project.

5.22 The Parties agree that as far as is reasonably practicable, BASI will endeavour to ensure that its investigation functions do not impede CASA investigation functions.

6.0 COOPERATION DURING INVESTIGATIONS

6.10 The parties agree that BASI will consult with CASA officers as required in the course of an investigation, and may require information and documents from CASA and/or specialist technical participation in BASI investigations by CASA officers.

6.11 Under section 19CC of the Air Navigation Act, CASA officers are obliged to provide BASI officers with information and documents requested. BASI's legislation over-rides the restrictions of information release imposed under the Privacy Act (1988) and the Freedom of Information Act (1982). CASA will place a high priority on BASI requests for information, documents and specialist participation during the course of investigations.

6.12 BASI will not seek to participate in CASA regulatory investigations, but may request participation in or information from any defect investigation undertaken by CASA. The parties agree that any BASI officer participating in a CASA defect investigation will be under the direction of CASA investigators.

6.13 The parties agree that CASA officers participating in BASI investigations will be under the direction of BASI investigators and will be required to comply with part 2A of the Air Navigation Act . At the discretion of the BASI Investigator In Charge (IIC), CASA officers participating in a BASI investigation may not be given access to all evidence which falls within evidence described in Paragraph 5.12 of Annex 13 to the Chicago Convention.

6.14 BASI recognises that CASA officers have a responsibility to keep their superior officers informed of the progress of an investigation and to advise immediately of information or data which indicate a need to

take urgent safety related action. Nevertheless, CASA officers participating in BASI investigations will not release accident or incident related data or information to those not authorised by the Director BASI to receive it.

6.15 CASA may request formal participation status in any BASI investigation. However, while BASI encourages CASA to participate in BASI investigations, BASI will maintain its role as an independent investigative agency.

7.0 RELEASE OF INFORMATION

7.10 Subject to Section 19CU of the Air Navigation Act, which precludes the release of specified information without the authorisation of the Secretary of the Department of Transport an Regional Development. (or delegate), and Annex 13 to the Chicago Convention (as outlined in 9.40 below), BASI may provide information to affected parties, or to the public, during an investigation.

7.11 Ministerial Briefing. BASI will advise the Minister's office, and relevant members of the Department of Transport and Regional Development Executive of serious or high profile accidents or incidents. BASI will also provide relevant advance briefing to the Minister and the Executive whenever it makes recommendations (either interim or final); circulates final reports in relation to investigations of serious or high profile occurrences; or proposes to release a media statement.

7.12 Media Contacts. During the course of an occurrence investigation by BASI, the Bureau will be responsible for initial contact with the media and subsequent briefing on information regarding the investigation. The parties agree that CASA should initially refer media inquiries on the investigation to the contact officer nominated by BASI. However, CASA is at liberty to comment on matters arising from the investigation which relate to CASA actions.

7.13 Where a request is made under the *Freedom of Information Act 1982*, BASI may provide information on accident or incident investigations.

In accordance with section 19CU of the Air Navigation Act and paragraph 5.12 of Annex 13 to the Chicago Convention, information released will not include:

(a) statements taken from persons by the investigation authorities in the course of their investigation;

(b) communications between persons having been involved in the operation of the aircraft;

(c) medical or private information regarding person(s) involved in the accident or incident;

(d) cockpit voice recordings and transcripts from such recordings; and

(e) opinions expressed in the analysis of information, including Flight Recorder Information.

7.14 CASA acknowledges that information to which its officers may have access in the course of assisting with a BASI investigation is not to be used as evidence in administrative or legal enforcement proceedings. The parties acknowledge that if information provided by pilots or others to a BASI investigator was to be used for enforcement it could prejudice the availability of such information in future investigations.

7.15 Consistent with the provisions of paragraph 5.4.1 of Annex 13 to the Chicago Convention, BASI will take all reasonable steps to prevent details of all oral and documentary evidence coming within the descriptions set out in sub paragraphs (a) to (e) of paragraph 5.12 of Annex 13 to the Convention (collectively referred to as "relevant material") being disclosed by production of documents or by oral evidence in any proceedings. BASI's efforts in that regard will extend to relevant material provided by CASA officers to BASI investigators in the course of BASI investigations. On the basis that BASI complies with this commitment, CASA, to the extent that it is within its reasonable control, will not seek to gain access to such relevant material.

7.16 BASI acknowledges that enforcement action may follow a BASI investigation. Further, BASI acknowledges that CASA may have to take safety-related enforcement action during the course of an investigation which may pre-empt BASI recommendations.

8.0 OCCURRENCE INVESTIGATION REPORTS

8.10 The type and frequency of occurrence reports is directly related to the category classification system.

8.11 For category 1 and 2 occurrences BASI will provide an *initial notification*, a *preliminary factual report* released approximately 21 days after the occurrence, an *interim factual report* released approximately 60 days after the occurrence, an *interested party draft final report* and a *final report in the ICAO format specified in Annex 13 to the Chicago Convention.*

8.12 For category 3 occurrences BASI will provide an *initial notification,* a *preliminary factual report* released approximately 21 days after the occurrence, and a final *Air Safety Occurrence Report (ASOR).* BASI may also circulate an *interested party draft final report* for HIGH PROFILE Category 3 occurrences.

8.13 For category 4 occurrences BASI will provide an *initial notification* and a final *Occurrence Brief.*

8.14 For category 5 occurrences BASI will provide an *initial notification* and, on request, an *occurrence data base record.*

8.15 Public release data base records are available for all occurrences regardless of categorisation. The parties agree that these records will be provided to CASA on request.

9.0 SAFETY DEFICIENCY INVESTIGATION AND RESEARCH REPORTS

9.10 The parties agree that BASI will provide high profile safety deficiency investigation and research reports to CASA and other interested parties in accordance with BASI's normal interested party process. All other safety deficiency investigation and research reports will be provided to CASA as final public documents.

10.0 INTERESTED PARTY PROCESS

10.10 The parties agree that CASA will be included as an interested party in relation to all BASI investigations.

10.11 The parties agree that copies of draft final reports are provided to interested parties for comment only. CASA agrees that it will not make public any part of a draft final report it receives as an interested party.

10.12 The parties agree that in relation to the investigation of all Category 1 and 2 (and high profile category 3) occurrences BASI will provide CASA (as an interested party) with a draft of the final report, usually excluding any recommendations, for review and comment before final publication. The parties agree that CASA's comments will be provided to BASI within 28 days of the date of the covering letter accompanying the draft report.

10.13 Comments from all interested parties will be considered, and may be incorporated into the final report as BASI considers appropriate.

11.0 RECOMMENDATIONS AND SAFETY DEFICIENCIES

11.10 The parties agree that BASI may make formal written recommendations to CASA at any time during an investigation or research project. BASI recommendations will result from the identification by BASI of perceived safety deficiencies. Each written recommendation will be accompanied by a written statement of the associated safety deficiency and supporting information which led to the recommendation being made.

11.11 BASI recognises that it is CASA's responsibility to determine any specific remedial action required and that such action will often involve full consultation with members of the aviation community. Therefore, in making recommendations for action by CASA, the parties agree BASI will identify, as far as practicable, only general courses of action. However, where BASI believes it is appropriate, it will make specific recommendations.

11.13 The parties agree that written statements identifying safety deficiencies may be forwarded to CASA without any accompanying recommendation.

11.14 Interim Recommendations. The parties agree that recommendations by BASI that are made before an investigation or research project is finalised will be identified as "interim recommendations". The parties acknowledge that Interim recommendations may, of necessity, be based on incomplete factual information and analysis, and will usually only identify areas for closer consideration. Interim recommendations may be subject to revision as the investigation or research study progresses.

11.15 Final Recommendations. The parties agree that final recommendations will be made after interested party comments have been received on the draft version of the final report of an investigation or research project. (The draft report will not usually include recommendations.) BASI will draw CASA's attention to any final recommendations in a report when it provides CASA with the final report.

11.16 CASA Response. The parties agree that within 60 days (or such other time as is agreed between the parties) of the issue of either an interim or final recommendation, CASA will respond to BASI, in writing. The written response is to contain clear statements of acceptance, partial acceptance or rejection of the recommendation(s). The response should also contain information detailing the timetable and procedures for implementing the recommendation(s) or part thereof. CASA will provide a full explanation if it decides not to implement any recommendation or part of a recommendation, and will identify any alternative action proposed.

11.17 The CASA response is to also identify which part of the written response is intended for publication by BASI.

11.18 The parties agree that where consideration and implementation of recommendations are protracted, CASA will inform BASI of progress at regular intervals.

11.19 The parties agree that BASI will incorporate CASA's response to interim recommendations into the final report and that BASI will publish a summary of CASA's response to final recommendations in a subsequent issue of *"Asia Pacific AIR SAFETY"*.

12.0 BASI/CASA SAFETY MAGAZINES

12.10 The parties acknowledge that both BASI and CASA produce and distribute quarterly magazine type publications dealing with aviation safety issues. The parties acknowledge that it is desirable to keep the degree of overlap in the content of the publications to a minimum.

13.0 FLIGHT RECORDERS

13.10 The parties acknowledge that the responsibility for certain aircraft to carry certain types of Flight Recorders is a joint CASA/BASI responsibility.

13.11 Under the current arrangements certain aircraft are required by Civil Aviation Orders to carry a Flight Data Recorder (FDR) and a Cockpit Voice Recorder (CVR) or a recorder combining both FDR and CVR functions.

13.12 Under section 19HM(1) of the Air Navigation Act, the Director BASI may specify the technical standards for FDR and CVR equipment.

13.13 Under the Civil Aviation Regulations CASA has the legal power to grant operators temporary exemption from the requirement to carry both recorders. CASA has delegated this power to BASI who currently issue all such exemptions.

14.0 FORMAL CONTACT POINTS

12.10 In relation to the undertakings made in this Memorandum of Understanding, BASI will direct all notices or other correspondence to the Deputy Director CASA. CASA will direct its notices and correspondence to the Director of Air Safety Investigation BASI.

ROBERT LEE

JOHN E PIKE
~~LEROY A. KEITH~~

Director of Air Safety Investigation
BASI

A/Director of Aviation Safety
CASA

Date 24 MAY 1996

1 JUNE 1996

Submission of the Civil Aviation Safety Authority
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Attachment C

Memorandum of Understanding between
The Australian Transport Safety Bureau and the Civil Aviation Safety Authority
(February 2010)

Australian Government
Australian Transport Safety Bureau

Australian Government
Civil Aviation Safety Authority

Memorandum of Understanding between the Australian Transport Safety Bureau and the Civil Aviation Safety Authority

February 2010

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

AND

THE CIVIL AVIATION SAFETY AUTHORITY

1 THE ORGANISATIONS

Civil Aviation Safety Authority

1.1 The Civil Aviation Safety Authority (CASA) is an independent Commonwealth statutory authority. Under section 9 of the *Civil Aviation Act 1988* (the CA Act), CASA is responsible, amongst other things, for the safety regulation of civil air operations in Australian territory and the operation of Australian aircraft outside Australian territory, and more generally, for the promotion of high standards of aviation safety.

1.2 As specified in section 3A of the CA Act, the main object of the CA Act is to establish a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation, with a particular emphasis on preventing aviation accidents and incidents.

1.3 One of CASA's safety-related functions specified in subsection 9(3) of the CA Act is to cooperate with ATSB in relation to investigations under the *Transport Safety Investigation Act 2003* (TSI Act) that relate to aircraft.

Australian Transport Safety Bureau

1.4 The Australian Transport Safety Bureau (ATSB) is established under the TSI Act as an independent Commonwealth statutory agency. The ATSB is governed by a Chief Commissioner and two or more Commissioners. The ATSB is not subject to direction from anyone in relation to the performance of its functions or the exercise of its powers.

1.5 The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through:

a) investigation of transport accidents and other safety occurrences

b) safety data recording, analysis and research

c) fostering safety awareness, knowledge and action.

1.6 Under the TSI Act, it is not a function of the ATSB to:

a) apportion blame or provide a means for determining liability for transport safety matters

b) except as provided by the TSI Act, assist in court proceedings between parties

c) allow any adverse inference to be drawn from the fact that a person was involved in a transport safety matter.

1.7 One of the ATSB's functions is to cooperate with organisations such as CASA that have functions or powers relating to transport safety.

2 PURPOSE AND STATUS OF THIS MOU

2.1 With respect to each organisation's separate but complementary safety functions, this MoU through its provisions, addresses the following objectives:

a) maximisation of beneficial aviation safety outcomes

b) enhancement of public confidence in aviation safety

c) support for the adoption of systemic approaches to aviation safety

d) development of knowledge of the operations and the safety impact of each organisation's actions

e) promotion and conduct of ATSB independent no-blame safety investigations and CASA regulatory activities in a manner that assures a clear and publicly perceived distinction is drawn between each agency's complementary safety-related objectives, as well as CASA's specialised enforcement-related obligations

f) to the extent practicable, the avoidance of any impediments in the performance of each other's functions

g) acknowledgement of any errors and a commitment to seeking constant improvement

h) fostering strategic discussion between both organisations.

2.2 In pursuing the objectives outlined in 2.1, both organisations agree to give effect the following values:

a) cooperation

b) honesty

c) trust

d) mutual respect

e) openness

f) professionalism.

2.3 **Attachments A** and **B** form part of this MoU. Where there is an inconsistency between a clause in the body of the MoU and a clause in attachment A or B the clause in the body of the MoU takes precedence.

2.4 **Attachments C** and **D** do not form part of this MoU and are provided for guidance only. They may be updated at any time by the organisation responsible for the information.

2.5 The ATSB and CASA will seek to uphold the values of this MoU and fulfil their respective commitments. However, both organisations acknowledge that this MoU is not legally binding and that nothing in this MoU can legally restrict the statutory duties, discretions and powers of either organisation under relevant legislation.

3 MEETINGS, SAFETY EDUCATION AND TRAINING

3.1 Executive meetings

3.1.1 The Director of Aviation Safety (DAS) and/or Deputy Director Aviation Safety (DDAS) (CASA) and the Chief Commissioner (CC) and/or the Deputy Chief Executive Officer (DCEO) (ATSB) and/or their nominated representatives, will endeavour to meet regularly to discuss matters including but not limited to:

a) each organisation's strategic direction and corporate/operational plans

b) relevant operating protocols of each organisation and any associated necessary or desirable interaction between the two organisations

c) a review of each organisation's individual and joint research programs

d) ATSB identified Safety Issues and Safety Recommendations and CASA's responses to these

e) outcomes of CASA parallel investigations (Note: refer to 4.1 for definition of 'parallel investigations'

f) mutual staff training and development opportunities.

3.2 Operational meetings

3.2.1 The Manager of CASA's Accident Liaison & Investigation Unit (ALIU) and the Directors and relevant Team Leaders of ATSB and other agreed staff of both organisations, will endeavour to meet at least biannually to discuss matters including but not limited to:

a) ATSB identified Safety Issues and Safety Recommendations and CASA's responses to these

b) outcomes of CASA parallel investigations (Note: refer 4.1 for definition of parallel investigations)

c) issues related to existing and proposed legislation

d) trends and other developments bearing on aviation safety

e) research initiatives

f) training/seminar opportunities

g) annual review of the MoU.

3.3 Communication co-ordination and contact points

3.3.1 During the course of an ATSB investigation, ATSB research or the handling of REPCON reports, the ATSB will liaise in the first instance with the ALIU and thereafter in accordance with agreed protocols.

3.3.2 The formal communication of CASA's position in response to matters raised by the ATSB, for inclusion in an ATSB investigation report, will normally be made by the DAS or his or her designee.

3.3.3 The processes specified in 3.3.1 and 3.3.2 are not intended to impede communication between the CC (ATSB), DCEO (ATSB) and the DAS (CASA) or DDAS (CASA).

3.3.4 Subject to the foregoing, interagency contact points for routine communications are set out in Attachment D.

3.4 Safety education:

3.4.1 Before either the ATSB or CASA commences a safety education program, the organisations will endeavour to consult with each other to identify any opportunities for mutual cooperation.

3.4.2 Both organisations agree to cooperate with respect to provision of information for *Flight Safety Australia* magazine.

*Note: refer to **Attachment B**.*

3.5 Shared training opportunities:

3.5.1 The ATSB will advise CASA of its program of training for a calendar period when it becomes available. CASA, as soon as practicable, will advise the ATSB if there are any training opportunities in the program that it wishes to place CASA staff members on. To the extent that resources are available the ATSB will consider the capacity to accommodate the request and advise CASA.

3.5.2 CASA will advise the ATSB of its program of training (including new technologies, aircraft types etc) for a calendar period when it becomes available. The ATSB, as soon as practicable, will advise CASA if there are any training opportunities in the program that it wishes to place ATSB staff on. To the extent that resources are available, CASA will consider the capacity to accommodate the request and advise the ATSB.

3.5.3 CASA and the ATSB will endeavour to advise one another of any changes to their respective annual training schedules as soon as practicable.

4 COOPERATION IN RELATION TO INVESTIGATIONS

4.1 Parallel investigations:

4.1.1 The ATSB may undertake 'no-blame' safety investigations in accordance with the TSI Act and CASA may separately undertake investigations with a view to possible safety-related action pursuant to its functions under Section 9 and/or Part IIIA of the Civil Aviation Act.

4.1.2 As soon as reasonably practicable after either the ATSB decides to conduct an investigation, or CASA decides to conduct an investigation in relation to a matter that would be a reportable matter to the ATSB, each organisation will notify the other organisation.

4.1.3 If either organisation considers an investigation conducted by the other organisation is creating an unreasonable impediment to the performance of their functions, they will raise the matter with the other organisation.

4.1.4 With respect to its own investigation, each organisation will seek to gather evidence from original sources in the first instance and then, where practicable, on the basis of information provided by the other organisation.

4.2 Request for assistance or involvement:

4.2.1 CASA and the ATSB may request assistance from each other in the performance of their respective functions. Resources permitting, and after consideration of any internal policies and legal requirements, as well as any conflicts of interest, each organisation will seek to accommodate a request from the other.

4.2.2 Where assistance is provided, each party will normally bear its own costs. However, if the party providing assistance at the request of the other party does so primarily or exclusively for the benefit of the requesting party, some or all of the costs of the party providing that assistance may be borne by the party to whom that assistance is provided.

4.2.3 **Attachment A** to this MoU provides guidance where the assistance provided involves participation in an investigation or where one organisation seeks to be involved in the other organisation's investigation.

4.3 Physical evidence at accident sites

4.3.1 In order to facilitate cooperation and coordination in relation to evidence at the site of an investigation, each organisation agrees to the following:

a) The normal expectation is that CASA will not attend the site that the ATSB is attending. The onus will be on CASA to advise the ATSB without delay after notification of an accident if it has any need to attend and inspect the accident site. On occasions when CASA attends the accident site, the ATSB will make any physical evidence available for inspection to CASA and not move, take, dismantle, change or alter any such piece of evidence without providing CASA, where practicable and as authorised by the ATSB Investigator In Charge, with the opportunity to conduct a detailed inspection of it in situ.

b) The ATSB has priority with respect to removal and custody of evidence at an accident site. However, where CASA has a requirement to remove and/or retain evidence, the organisations will consult with each other with a view to the achievement of each organisation's objectives.

c) Each organisation will ensure that the removal and/or retention of evidence is conducted in accordance with appropriate chain-of-evidence protocols.

4.4 Disclosure of information relating to investigations

4.4.1 It is understood that the provision of all information will be subject to the legal obligations and policies applicable to both organisations.

4.4.2 CASA and the ATSB will consult with each other in the development of their policies and procedures regarding the disclosure and use of safety information, including the mechanisms for disclosure and protections to be applied to information received from the other agency.

4.4.3 If the ATSB requests information from CASA, such requests will normally be directed to and through the ALIU in the first instance. Thereafter, further and/or related communications may be directed to another relevant officer or group within CASA.

4.4.4 CASA agrees to assist the ATSB in relation to the provision of documents and other evidence or specialist participation concerning transport safety matters that the ATSB is investigating. Normally, the request will be made pursuant a Section 32 notice to ensure that information provided is protected as restricted information under Division 2 of Part 6 of the TSI Act. When a request for information is not directed to CASA by a Section 32 notice, CASA may request the issue of a notice to the Authority prior to the release of the requested information.

Note: CASA and the ATSB recognise and acknowledge their respective obligations under the Privacy Act 1988.

4.4.5 Unless otherwise agreed, a notice issued under Section 32 will allow CASA ten (10) Canberra business days to respond. CASA acknowledges that there

may be exceptional circumstances where shorter time frames may be required and will seek to cooperate in meeting those time frames.

4.4.6 CASA agrees that if a CASA Officer is known to have information that could assist the ATSB in the performance of its investigative functions, CASA will undertake to advise the ATSB of the existence of the information.

4.4.7 The ATSB recognises that CASA needs to be advised as soon as practicable where an investigation reveals information that indicates a need to take urgent safety-related action. In such cases, the ATSB will release such information to CASA, normally via the ALIU, who will disseminate the information in the most appropriate manner.

4.4.8 ATSB may disclose restricted information to CASA under section 61 of the TSI Act or authorise CASA's access to such information under section 62 of the TSI Act. If information is disclosed to CASA under section 61, and if CASA decides to take safety-related action on the basis, in whole or in part, of that information, CASA will advise the ATSB accordingly.

4.4.9 Where the ATSB, in consultation with CASA, agrees that the information released under section 62 discloses a need for CASA to take safety action, and CASA cannot obtain it from an alternative source in a timely fashion, the ATSB agrees to consider alternative means of releasing the information.

4.4.10 CASA agrees that, whenever it conducts a parallel investigation into a transport safety matter the ATSB is also investigating, CASA will, subject to any legal or other applicable requirements, provide the ATSB with a copy of the CASA investigation report or other compilation of relevant details as soon as it is practicable to do so

4.4.11 **Attachment C** to this MoU lists the types of restricted information that the ATSB may obtain during an investigation and the circumstances where that information may be considered for release. While acknowledging the need to protect sensitive, restricted and on-board recording (OBR) information, the occasional need for destructive testing, and the practical constraints in ensuring proof of chain of evidence, the guidance seeks to ensure that the investigations of both the ATSB and CASA can proceed in parallel.

5 OCCURRENCE NOTIFICATION AND INVESTIGATION REPORTS

5.1 Notification of Transport Safety Matters and provision of reports

5.1.1 Notification to ATSB:

CASA Officers, in fulfilling their reporting requirements for immediately reportable matters (IRMs) and routine reportable matters (RRMs) under the TSI Act should normally use the contacts identified in Attachment D.

5.1.2 Notification and reports to CASA:

a) The ATSB will notify the CASA Media Contact (Section Head Corporate Communications) or the Manager ALIU (if CASA Media Contact is not contactable) of an IRM as soon as reasonably practicable.

b) CASA will be provided with copies of all ATSB notifications. However, CASA understands that the ATSB will de-identify reports by removing information identifying individuals including:

i. name(s);

ii. address(es);

iii. contact details; and

iv. ARN(s).

c) The information in 5.1.2 (b) will be provided to CASA automatically by the ATSB in the form of a daily report and weekly report as appropriate.

d) In addition to providing the initial notification, where the ATSB conducts an investigation, reports released to CASA will include:

i. preliminary factual reports released approximately 30 days after the occurrence (if issued);

ii. interim factual reports, released approximately every six months after the release of the preliminary factual report until the draft report is ready for release to Directly Involved Parties (DIPs) (if issued);

iii. draft reports; and

iv. final reports.

e) **Attachment D** contains the relevant contact points.

5.2 Directly Involved Party process

5.2.1 CASA will be deemed to be a Directly Involved Party (DIP) in relation to all ATSB aviation investigations. In the case of a Level 4 investigation, there may be no DIP response required by CASA. However, if CASA does wish to respond, it must respond within the notified time frames outlined in 5.2.3.

5.2.2 The ATSB will provide a copy of the Draft report to CASA and other DIPs for the purpose of making a submission to the ATSB on the report or to address any factual inaccuracies or analytical or safety issue incongruities identified in the report's findings. CASA is encouraged to make comment and where possible CASA is expected to support any comments with relevant evidence.

5.2.3 Unless otherwise agreed, all submissions from CASA as a DIP are expected to be made in writing within 28 days of the date of the ATSB's covering letter.

5.2.4 Submissions from CASA will be considered by the ATSB and, where considered appropriate, the ATSB report will be amended accordingly.

5.2.5 Where the ATSB seeks to publish a CASA submission in whole or in part, the ATSB will consult with CASA before doing so.

5.2.6 The ATSB acknowledges that nothing prevents CASA from commenting publicly on the final version of the report.

5.2.7 The ATSB will normally provide CASA with a copy of the final report eight Canberra working days prior to the date on which that report is to be publicly released.

5.3 Safety action

5.3.1 The ATSB understands actions may be taken by CASA in response to safety issues during the course of an ATSB or CASA investigation, and the ATSB will include this information in the investigation report to the extent it is practicable to do so. The ATSB encourages safety action that obviates the need to make safety recommendations.

5.3.2 In order to ensure that any safety action is properly acknowledged by the ATSB, CASA will advise the ATSB of any safety action taken or intended to be taken by CASA.

5.3.3 In making recommendations for safety action by CASA, the ATSB will clearly and explicitly identify the safety issue(s) involved. The ATSB will consult with CASA prior to a recommendation being made.

5.3.4 CASA response to safety recommendations- In accordance with section 25A of the TSI Act, CASA will respond to the ATSB in writing within 90 days of the date on which the report is published, and include in that response the information required under section 25A. The CASA response should clearly identify which part of the written response is intended for publication on the ATSB website and/or in the final report.

5.3.5 Where consideration and implementation by CASA of an ATSB recommendation is or may be protracted, CASA will inform the ATSB of progress at regular intervals as agreed between the organisations.

5.3.6 CASA and the ATSB will seek to ensure that information posted about the status of ATSB recommendations on their respective websites is consistent.

Note: This may be achieved via a link on the CASA website to the ATSB website.

6 COOPERATING IN THE CONDUCT OF RESEARCH AND DATA ANALYSIS AND SHARING SAFETY-RELATED INFORMATION

6.1 Before either the ATSB or CASA commences general research, data analysis or related investigations, the organisations will endeavour to consult with each other to identify the opportunity for input and mutual cooperation.

6.2 General research and data analysis reports will be provided to CASA in accordance with the ATSB's normal DIP process or as otherwise agreed between the organisations (having regard to applicable requirements and constraints).

6.3 CASA and ATSB will explore ways to access and make constructive use of the safety-related data each organisation collects.

6.4 Where appropriate and practicable, CASA and the ATSB will enter into discrete arrangements for sharing and providing reciprocal access to data and other safety-related information. Such arrangements may be included as appendices to this MoU.

7 CONFIDENTIAL REPORTING SCHEMES

7.1 The Air Navigation (Confidential Reporting) Regulations 2006 establish an aviation confidential reporting scheme (REPCON) which allows any person who has an aviation safety concern to report it to the ATSB confidentially. Under the REPCON scheme, personal information will not be disclosed unless permission is granted by the individual concerned. Only de-identified information will be used for safety action.

7.2 The ATSB will forward relevant de-identified REPCON information to CASA.

7.3 As soon as practicable, but within 28 days or as otherwise agreed, CASA will advise the ATSB of its response to any safety concerns raised in relation to information provided to CASA pursuant to 7.1 above. CASA's written response

will indicate whether CASA considers the matter a valid safety concern and, if so, any proposed safety action CASA intends to take on the matter.

7.4 It is recognised that, due to the de-identification necessary to protect the identity of the reporter or a person referred to in a confidential report, there may be cases when CASA has a limited capacity to offer a view on the matter or to take any targeted safety action. In such cases, CASA may seek to discuss the matter further with the ATSB to determine whether additional information can be made available to CASA.

7.5 CASA may use information supplied in a REPCON report in *Flight Safety Australia* magazine or other appropriate educational and safety promotion materials.

8 BRIEFING AND CONTACT WITH THE MEDIA

8.1 **Executive briefing** – In addition to any advice about such matters the ATSB may provide to the Minister and/or the Department of Infrastructure, Transport, Regional Development and Local Government, the ATSB will advise CASA of serious and high profile aviation accidents and other aviation-related safety occurrences.

8.2 The ATSB will advise CASA whenever it makes recommendations, circulates final reports in relation to investigations of serious and high profile occurrences or proposes to release a significant media statement in relation to any matter related to aviation safety.

8.3 CASA will endeavour to inform the ATSB and provide advance briefings before it makes any comments pertaining to any serious or high profile transport safety matters the ATSB is known to be investigating.

Contact with the media – All media inquiries received by the ATSB in relation to regulatory matters, including CASA investigations, should be referred to CASA. Likewise, all media inquiries received by CASA relating to the initiation or conduct of ATSB investigations should be referred to the ATSB. CASA is, however, at liberty to comment on such matters arising from its own parallel investigations or, if there is a particular reason to comment on an occurrence, CASA will make it clear that the ATSB is undertaking an independent investigation which should not be prejudiced by any comment CASA may make.

9 DURATION, VARIATIONS & DISPUTE RESOLUTION

9.1 This MoU will remain in effect for three years from the date of its execution.

9.2 This MOU may be extended, varied or terminated by exchange of letters between the ATSB and CASA.

9.3 In the event that any disagreements or disputes arise in respect to any of the provisions of this MoU, the dispute/disagreement will initially be referred to the Director, Aviation Safety Investigation (ATSB) and the Manager ALIU (CASA). Should a mutually satisfactory resolution not be forthcoming, the issue will be referred to the DAS (CASA) and CC (ATSB) for resolution. If unresolved at that level, the matter should be raised jointly by the DAS (CASA) and the CC (ATSB) with the Secretary of Department of Infrastructure, Transport, Regional Development and Local Government.

Dated at Canberra this Ninth day of February 2010

JOHN FRANCIS McCORMICK
Director of Aviation Safety
Civil Aviation Safety Authority

MARTIN NICHOLAS DOLAN
Chief Commissioner
Australian Transport Safety Bureau

ATTACHMENT A - Participation in investigations

1. Participation in investigations will be co-ordinated through the Manager ALIU, CASA and the Director Aviation Safety Investigations, ATSB.
2. The Organisations may agree that a CASA officer may act as an observer or an external investigator for the purposes of an ATSB safety investigation under the direction of the Investigator In Charge (IIC). The CASA Officer will be required to sign an agreement acknowledging his or her obligations and duties, appropriate to the level of their involvement in a transport safety investigation.
3. The CASA Officer will be given access to evidence to the extent necessary to enable the IIC to effectively complete the investigation.
4. The ATSB will not normally seek to participate in CASA regulatory investigations, but may request participation in, or information from, any investigation undertaken by CASA. ATSB Officers who participate in a CASA investigation must comply with any lawful direction given to them by the CASA Officer-in-charge of the investigation.

Safety equipment for on-site

5. If CASA Officers attend an ATSB controlled accident site, they must ensure they meet the ATSB minimum training, occupational health and safety, and personal protective equipment requirements.
6. Where the ATSB has requested that a CASA officer attend an accident site to assist in an ATSB investigation, the ATSB will provide the CASA Officer with any required disposable protective equipment (i.e. overalls, face masks, gloves and safety glasses).

ATTACHMENT B – ATSB supplements in *Flight Safety Australia* magazine

PURPOSE

1. This attachment sets out the arrangements agreed between CASA and the ATSB regarding the inclusion of the ATSB material in *Flight Safety Australia* magazine.

BACKGROUND

2. *Flight Safety Australia* is a magazine produced every two months by CASA for the purposes of safety education and promotion. It is generally distributed six times a year to all Australian aviation licence holders, other interested readers in Australia and overseas subscribers.

3. CASA has published editorial material provided by the ATSB in *Flight Safety Australia*, in the form of an ATSB supplement.

AGREED ARRANGEMENTS

4. The ATSB will supply an eight-page ATSB Supplement to be included in Flight Safety Australia for the duration of the MoU. Where the ATSB seeks to temporarily or permanently increase this page allocation, the ATSB may negotiate this request with CASA.

5. CASA will publish the ATSB Supplement in the edition of *Flight Safety Australia* for which it was supplied, at no cost to the ATSB.

6. The editorial content of the ATSB Supplement is a matter for the ATSB. Consequently, ATSB takes full responsibility for the content of the ATSB Supplement, except to the extent that there is any substantive difference between the Supplement as supplied to CASA and the Supplement as published in *Flight Safety Australia*.

7. CASA may comment on the ATSB Supplement, including on editorial matters such as format, style, and language, and substantive matters such as factual content and opinion. The ATSB will consider these comments as provided in good faith.

8. If any material in the ATSB Supplement supplied to CASA is critical of CASA or the system of aviation safety regulation, CASA may request the ATSB to include in the ATSB Supplement a statement by CASA in response to that criticism. If such a statement is not agreed for publishing in the ATSB Supplement, CASA reserves the right to comment elsewhere within *Flight Safety Australia*. CASA will advise the ATSB of any such comment prior to its publication.

Design and provision of ATSB supplement

9. ATSB will supply the ATSB Supplement as an In-Design document, or in a format agreed by both organisations. The ATSB will ensure the Supplement reflects the format and style of *Flight Safety Australia's* design while retaining its distinct identity that reflects the ATSB's role as separate from and complementary to CASA.

10. The ATSB will provide the pre-designed ATSB Supplement at a time that meets the production deadlines for *Flight Safety Australia* advised by CASA, for the forthcoming year.

11. The ATSB may elect to not provide the ATSB Supplement for an edition, but must advise the Editor, *Flight Safety Australia* of non-inclusion one week prior to the advertising booking date applicable for that issue.

Non publication of an edition of Flight Safety Australia

12. Should CASA decide not to publish, or to delay the publication of, an edition of *Flight Safety Australia*, for any reason, CASA will advise ATSB of the decision as soon as practicable.

ATSB editorial representative for Flight Safety Australia editorial advisory group

13. The ATSB may nominate an editorial representative to liaise with the editor, *Flight Safety Australia* on a regular basis.

14. The ATSB's editorial representative, or a nominee of ATSB's editorial representative, and the Editor, *Flight Safety Australia* will take part in regular meetings for the duration of this Memorandum, unless otherwise agreed.

Provision of other material in Flight Safety Australia which does not appear in the ATSB Supplement

15. CASA may, from time to time, seek to publish articles in *Flight Safety Australia* which relate to investigations and research undertaken by ATSB. The ATSB undertakes to co-operate with CASA or writers nominated by CASA, in drafting and checking such articles, provided ATSB personnel are available to do so. The ATSB's inability to provide personnel for such purposes will not prevent CASA from publishing the article.

16. The ATSB will send to CASA a bi-monthly notification of its accident list for inclusion in *Flight Safety Australia*.

17. The ATSB will send to CASA a list of most recently published investigation reports for inclusion in *Flight Safety Australia*.

18. The ATSB may seek to publish material, including articles and advertisements, in *Flight Safety Australia* outside of the ATSB Supplement. In such cases, CASA and ATSB will enter into the normal contractual arrangements (including fees) for publication of that material.

Income from Flight Safety Australia

19. All advertising and subscription revenue derived from *Flight Safety Australia* is retained by CASA.

ATTACHMENT C - Restricted information categories

Subject to the applicable provisions of the *Transportation Safety Investigation Act 2003* (TSI Act), the following guidelines apply to the release of various types of Restricted Information by the ATSB:

(a) Statements (whether oral or in writing) obtained from persons by a Commissioner, staff member or consultant in the course of an investigation (including any record of such a statement) under the TSI Act

- Statements will not be released to CASA or to any other organisations seeking access because of the importance the ATSB places on encouraging the free flow of this information for safety purposes on the basis that it will be protected.
- Subject to any concerns raised by witnesses, the ATSB will seek to provide CASA with a list of all witnesses that have been interviewed by the ATSB during the course of the ATSB investigation.

(b) Information recorded by a Commissioner, staff member or consultant in the course of an investigation under the TSI Act

- This category of restricted information will most often contain personal information, opinions and analysis and will not generally be released. However, where it represents simple factual information, for example, a wreckage plot, such information would be considered for release after it has been verified by the ATSB. The Chief Commissioner would need to be convinced on a case-by-case basis that the circumstances warranted the release of any other type of restricted information recorded by a staff member.

(c) Communications with persons involved in the operation of a transport vehicle that was or is the subject of an investigation under the TSI Act

- This category of restricted information does not include OBR information. It would normally cover recordings such as Air Traffic Control and AVDATA tapes. The ATSB will advise CASA to obtain this evidence from the original source.
- Where advised in writing that it is not possible to obtain this evidence from the original source, including relevant justification, the ATSB will reconsider the request from CASA.

(d) Medical or private information regarding persons (including deceased persons) involved in a transport safety matter that is or has been investigated under the TSI Act

- Other than advised elsewhere in Attachment C, the ATSB will advise CASA to obtain other medical and private information from the original source.

(e) In relation to a transport vehicle that is or was the subject of an investigation under the TSI Act – information recorded for the purpose of directing or monitoring the progress of a vehicle from one place to another or information recorded in relation to the operation of the vehicle

- This category of restricted information includes a variety of recorded information such as radar plots and flight recordings.
- The ATSB will advise CASA to obtain this information from the original source.
- Where advised in writing that it is not possible to obtain this evidence from the original source, including relevant justification, the ATSB will reconsider the request from CASA.

(f) Records of any analysis of information or evidential material acquired in the course of an investigation (including opinions expressed in that analysis)

- This category of restricted information would include analysis carried out by ATSB personnel as well as external personnel assisting the ATSB either under contract or by other agreed arrangements, for example, technical analysis of components or human factors analysis.
- The Chief Commissioner would need to be convinced on a case by case basis that the circumstances warranted the release of this type of restricted information. It is likely that if the information is released to CASA it will be in the form of a section 25 report to ensure that the information cannot be used in any other legal forums.

(g) Information contained in a document that is produced to the ATSB under paragraph 32(1)(b) of the TSI Act.

- This category of restricted information has been obtained under compulsion powers where self-incrimination is not an excuse for not providing the information. Consequently, it attracts self-incrimination immunity and, as such, will not be released to CASA but may be obtained from the original source.

(h) Information contained in a document that is produced to the ATSB under paragraph 36(3)(a) or 4(a)

- This category of restricted information has been obtained under compulsion powers where self-incrimination is not an excuse for not providing the information. Consequently, it attracts self-incrimination immunity and, as such, will not be released to CASA but may be obtained from the original source.

(i) Information contained in a report made under a voluntary reporting scheme

- Voluntary reporting schemes are not currently established under section 20A of the TSI Act. Refer to the confidentiality arrangements that apply to voluntary reporting schemes administered by the ATSB in relevant legislation.

(j) Information obtained or generated by the ATSB in the course of considering a report made under a voluntary reporting scheme

- Voluntary reporting schemes are not currently established under section 20A of the TSI Act. Refer to the confidentiality arrangements that apply to voluntary reporting schemes administered by the ATSB in relevant legislation.

(k) Records of analysis of information contained in a report made under a voluntary reporting scheme (including opinions expressed by a person in that analysis)

- Voluntary reporting schemes are not currently established under section 20A of the TSI Act. Refer to the confidentiality arrangements that apply to voluntary reporting schemes administered by the ATSB in relevant legislation.

ATTACHMENT D: Contact points

Investigations

ATSB: Team Leader for investigation advised by ATSB

CASA: Manager Accident Liaison & Investigation Unit

Research and Data Analysis

ATSB: Team Leader – Research, Investigations and Analysis

CASA: Manager Safety Performance Analysis – Safety Analysis and Education

Data Requests

ATSB: Team Leader – Notifications and Confidential Reporting

CASA: Manager Accident Liaison & Investigation Unit

Confidential Reporting

ATSB: Team Leader – Notifications and Confidential Reporting

CASA: Manager Accident Liaison & Investigation Unit

Safety Education

ATSB: Team Leader – Research Investigations and Analysis

CASA: Manager Safety Education - Safety Analysis and Education.

Training

ATSB: Manager – Personnel Services

CASA: Manager Learning and Development - Safety Analysis and Education.

Submission of the Civil Aviation Safety Authority
to the Senate Standing Committee
on Rural and Regional Affairs and Transport

Inquiry into Aviation Accident Investigations (Pel-Air)

Attachment D

CASA Accident Liaison and Investigation Unit
Accident Investigation Report 09/3 Israel Aircraft Industries Westwind VH-NGA
Operated by Pel-Air Aviation Pty Ltd - Norfolk Island – 18 November 2009
(21 July 2010)

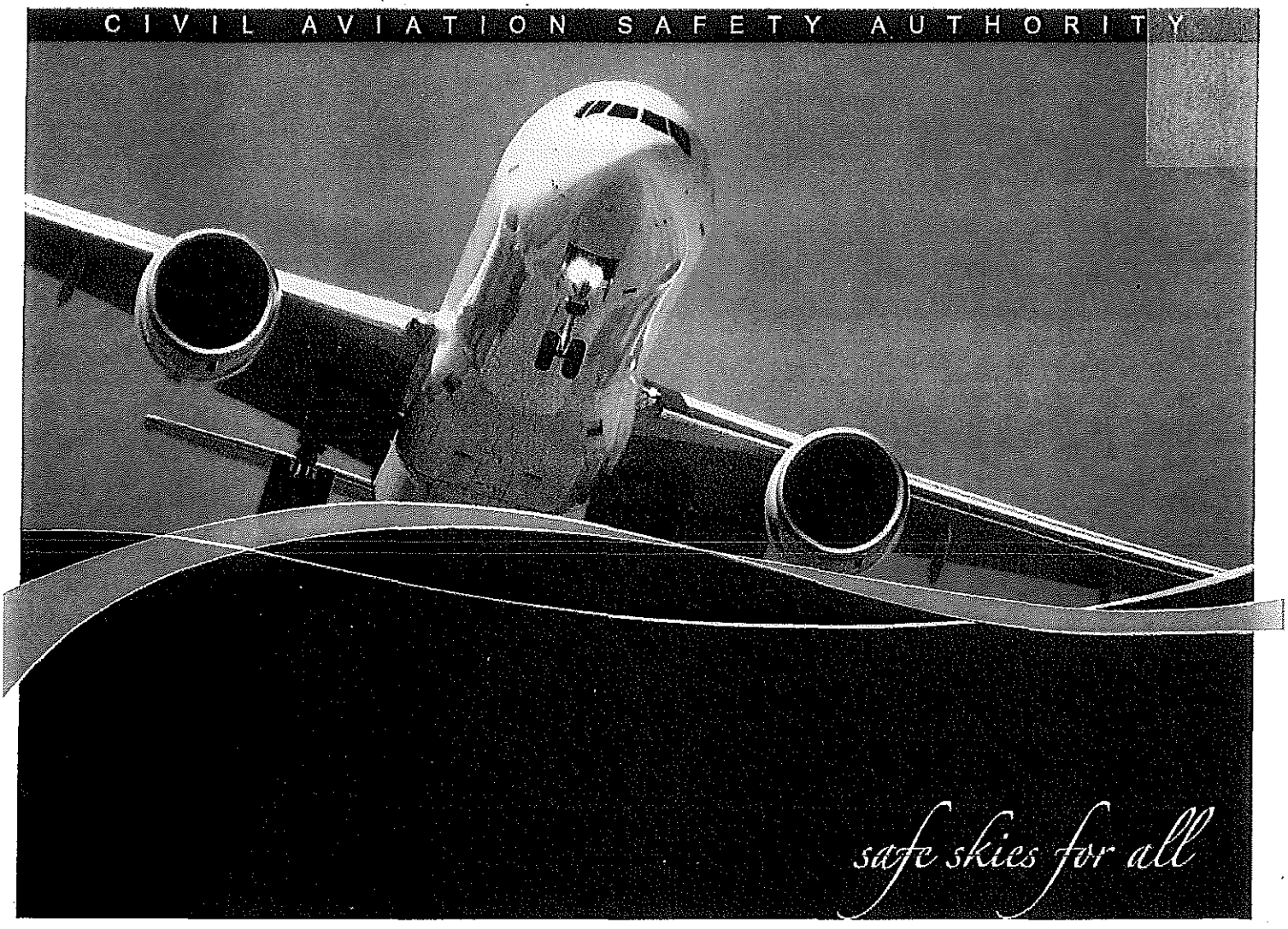
Australian Government
Civil Aviation Safety Authority
www.casa.gov.au

CASA

Accident Liaison and Investigation Unit
Accident Investigation Report 09/3
Israeli Aircraft Industry Westwind

VH-NGA

Operated by Pel-Air Aviation Pty Limited
Norfolk Island 18 November 2009



Westwind Series 1 Showing Door and Window Exit same as Series 2 VH-NGA

AIRCRAFT ACCIDENT REPORT No. 09/3

Aircraft Type, Serial Number and Registration:	Westwind Series 2 Serial No:387 VH-NGA
Number and Type of Engines:	Twin Turbine-Garrett AiResearch-TFE-731-3-IG Turbofan.
Year of Manufacturer:	1983
Date and Time:	18/11/2009 – 22:00 Local
Location:	Norfolk Island Latitude: S29° 02.6 Longitude: E167°56.3
Type of Flight:	Aerial Work - Ambulance flight
Persons on Board:	Crew: 4 Passengers:2-Patient and partner
Injuries:	Crew: Captain –Nil Co Pilot has rib injuries. Passengers: Nil
Nature of Damage:	Aircraft ditched in sea, currently lies in 47 meters of water. Total loss.
Pilot-in-Command's Licence	Airline Transport Pilot Licence (ATPL) ARN: 519777.
Pilot-in-Command's Age	33 years
Pilot-in-Command's Total Flying Experience:	Approx 4520 Hrs (750 on type)
Information Sources:	CASA field investigation
Investigators :	Mr R White Mr John Barr Mr Len Veger Mr Ben Cook Mr Glenn Jones

*** All times in this report are in UTC except where noted**

Glossary of abbreviations used in this report:

AUSFIC Australian Flight Information Centre
AGL Above Ground Level
ALIU Accident Liaison and Investigation Unit
AMSL above mean sea level
ATA actual time of arrival
ATC air traffic control
ATPL Airline Transport Pilot Licence
ATS air traffic services
ATSB Australian Transport Safety Bureau
CASA Civil Aviation Safety Authority
CAR Civil Aviation Regulation(s)
CEO Chief Executive Officer
CVR Cockpit Voice Recorder
DME Distance Measuring Equipment
DPNR Depressurised Point of No Return
EET estimated elapsed time
ETA estimated time of arrival
ETD estimated time of departure
FAID fatigue analysis interdyne
FDR Flight Data Recorder
FL flight level
ft foot or feet
FRMS fatigue risk management system
GPS Global Positioning System
HF high frequency
HPa hectopascals
IAS indicated airspeed
IFLS individual fatigue likelihood score
IFR instrument flight rules
ILS instrument landing system
kg kilogram(s)
lb pound(s)
LRC Long Range Cruise
MDA Minimum Decision Altitude
nm nautical miles
PAPI Precision approach path indication (lights)
PNR point of no return
RVSM Reduced Vertical Separation Minima
TAS true airspeed
TAF Terminal Area Forecast
TOD top of descent
UTC Coordinated Universal Time
UNICOM Local non air traffic communications service providing information to pilots

VHF very high frequency
VOR VHF omni-directional radio range
YSNF Norfolk Island Airport

ACCIDENT INVOLVING VH-NGA ON 18/11/2009 at NORFOLK ISLAND

Abstract

This report relates to an Israel Industry Westwind aircraft operated by Pel-Air which was involved in an accident at Norfolk Island airport at about 22:00 hours local on Sunday 18 November 2009. The aircraft registered as VH-NGA was being used for an Aerial Work operation transferring a patient, her partner and medical team from Apia in Samoa to Melbourne in Australia via Norfolk Island for a refuelling stop. The task originated on 17 November when the aircraft departed Sydney for Apia Samoa via Norfolk Island. There were four crew on board, consisting of two pilots a Doctor and a Nurse. This flight was classified as Aerial Work, being an Ambulance Function as per the company Air Operators Certificate; the patient's partner accompanied her on the return flight to Australia. The aircraft was flown from Apia to Norfolk where it encountered weather which precluded a successful approach and landing on to the runway. After four attempts to land the aircraft fuel supply was nearly exhausted and the Captain elected to ditch the aircraft into the sea approximately 6 kilometres off the West coast of the Island. The ditching was carried out in darkness with very low cloud, rain and mist, preventing any visual reference to the surface of the sea. All six persons on board survived and were rescued by boat and taken to Norfolk Island.

Synopsis

The Accident was notified to the Australian Transport Safety Bureau (ATSB) who in turn notified the Civil Aviation Safety Authority (CASA) on Wednesday 18 November. The ATSB decided to conduct an investigation. The CASA Manager Accident Liaison and Investigation Unit (ALIU) was tasked with conducting a parallel investigation for CASA purposes. An investigation into the circumstances of the accident was commenced the next day. CASA informed the ATSB of the investigation in accordance with sub section 4.1.2 of the joint MOU.

1.0 Factual Information

1.1 History of the flight

VH-NGA was on an Aerial Work patient transfer flight from Apia to Norfolk Island. The flight departed Apia International Airport at about 0545UTC 18 November 2009. Route distance was 1455nm. The Captain submitted a verbal flight plan to the AUSFIC Brisbane briefing office which indicated the route would be via reporting points KILAN, APASI, DUNAK and DOLSI.

The estimated flight time to Norfolk Island submitted to Brisbane briefing was 3 hours and 30 minutes.

The following history is constructed from a transcript of the taped conversations between the aircraft and ATC centres in Auckland and Fiji together with voice communication tapes from the Unicom operator on Norfolk Island.

The aircraft departed Apia at 0545 UTC with 4 crew and 2 passengers on board.

0600 UTC the aircraft was initially cleared to climb to FL 310.

0620 UTC the aircraft was cleared to climb to FL 350.

0628 UTC the aircraft was instructed to descend to FL 270. VH-NGA advised Auckland Air Ground that a descent to FL 270 would pose fuel problems for the flight.

NOTE: *VH-NGA was not RVSM approved.*

0630 UTC the aircraft advised they were capable of climbing to FL 390 if available.

0633 UTC Auckland Air Ground ATC cleared VH-NGA to climb to FL 390.

0637 UTC the aircraft reported position at KILAN at time 0636 UTC passing FL 350 estimating APASI at time 0706 UTC.

0644 UTC the aircraft advised they were maintaining FL 390. Auckland advised the aircraft to contact NADI at APASI.

0711 UTC the aircraft contacted NADI ATC.

0716 UTC the aircraft provided a position report to NADI for APASI at 0709 UTC and estimated DUNAK at 0736 UTC at flight level 390.

0737 UTC the aircraft reported DUNAK at 0736 UTC and estimated DOLSI at 0838 UTC at flight level 390.

0756 UTC the aircraft requests an updated METAR for Norfolk.

0801 UTC NADI ATC provides the aircraft with the METAR for YSNF issued at 0630 ZULU. This was then updated with an Auto SPECI for Norfolk issued at 0800 ZULU. Wind 290 at 08 Knots cloud overcast (OVC) at one thousand one hundred ft AGL, 21°C and the dew point was 19°C and QNH Norfolk 1012.

0803 UTC an amended TAF for YSNF was issued. This TAF placed an alternate on YSNF due BKN cloud at 1000ft AGL.

NOTE: *The current weather forecasts for aerodromes en route such as Nadi, Fua'Amota, Noumea did not require weather alternates.*

0841UTC the aircraft reported their DOLSI position at 0839 UTC, and advised an estimate YSNF of 0956 UTC.

0904 UTC the aircraft requested the 0900 UTC METAR for YSNF. Auckland Air Ground provided the aircraft with a Special weather report. The SPECI confirmed the weather in

the 0803 UTC amended TAF, and reported Scattered (SCT) cloud at 500ft and Broken (BKN) cloud at 1100ft and overcast at 1500ft. The wind was 270 at 07 Knots visibility 7000 metres. The temperature was 20°C and the dew point was 19°C. The SPECI confirmed the alternate requirement for YSNF. The alternate minima for YSNF from the YSNF Aerodrome Chart for Cat C aircraft is 1169 ft AGL and 6.0km visibility. The aircraft captain acknowledged receipt of the information.

The straight in approach landing minima where the actual QNH is known is listed for the Minimum Decision Altitude for the following runways:-

VOR Runway 11 MDA (H) 750 feet AMSL (429 AGL) and 3.0 Kilometres

VOR Runway 29 MDA (H) 850 feet AMSL (484 AGL) and 3.5 Kilometres

Cloud cover to be no more than 4 octas

NOTE: *Instructions in the operator's operations manual requires crew to add 500ft and 2km to the most restrictive circling minima at the destination for calculating Alternate Minima for International Operations.*

NOTE: *0904 UTC The aircraft was 3hrs 19 minutes since departure NSFA. Using company fuel planning figures the aircraft would have burnt approximately 5108lbs to this point, leaving 2222lbs remaining from the original 7330lbs. 2222lbs minus reserves gave a flight fuel remaining of 1622 lbs. Noumea (Tontouta) was 430nm, using LRC at FL 390 the aircraft required 1230lbs of flight fuel for a diversion to Noumea. Noumea would remain in range as a diversion alternative with fixed reserves intact for the next 7 minutes or until 0911 UTC.*

0916UTC Auckland Air Ground requested VH-NGA's TOD (top of descent) time for YSNF. The aircraft responded with TOD time of 0940UTC.

0928UTC the aircraft called the Unicom Operator on Norfolk Island using VHF radio advising that they were about 162 nm or 20 minutes from the airport. Norfolk Island Unicom provided an updated weather report, indicating deteriorating weather conditions to well below landing minima.

NOTE: *Subsequently during the approach to Norfolk the Captain sought regular weather updates from Norfolk Unicom and asked if these were from the "robot" (automatic) reporting station. The Captain asked the Unicom operator to go out on to the runway to asses the conditions to supplement the official weather report. The Unicom operator confirmed the deteriorating conditions.*

0932 UTC Auckland Air Ground using HF radio cleared VH-NGA to commence descent to YSNF when ready and to report passing FL 240. Auckland also offered the latest SPECI weather to the aircraft. The SPECI confirmed the weather at YSNF had continued to deteriorate since the 0904 UTC report. The wind was 200 at 07 Knots and the cloud and visibility were now well below the approach minima and the VOR MDA. The reported cloud was BKN at 200ft, BKN at 600 ft, and OVC at 1100 ft and visibility

4500 meters. From an operational aspect, the SPECI at 0932 UTC rendered YSNF unsuitable as a destination.

NOTE: *0932 UTC was 3hrs 47 minutes since departure from YSFA. Using company fuel planning figures the aircraft would have burnt approximately 5668lbs to this point, leaving 1662lbs remaining from the original 7330lbs. 1662lbs minus reserves gives a flight fuel remaining of 1062 lbs. Noumea was 410nm, using LRC at FL 390 the aircraft required 1260lbs of flight fuel for a diversion to Noumea. Using company planning figures the aircraft would need to burn 200lb of the fixed reserve to fly to Noumea.*

0946 UTC the aircraft reported passing FL240, and advised they would report on the ground.

1004 UTC the aircraft conducted a missed approach from a landing attempt using the instrument approach (VOR/DME) to Runway 29. At that time it was dark and raining with low cloud and the crew were not able to sight the airport at the missed approach point depicted on the chart. This approach and missed approach was conducted by the Co-pilot.

1013 UTC the Captain assumed control of the aircraft and conducted a second instrument approach for runway 29. The crew were unable to sight the runway and a missed approach was carried out.

1019 UTC the Captain repositioned the aircraft for a runway 11 instrument approach; this approach permitted the aircraft to descent 100 foot lower than the runway 29 approach. The crew did not sight the runway and reported that they were going to have to ditch the aircraft in the sea as they were running out of fuel. The Co-pilot contacted the Unicom operator and advised that they would make one more attempt before ditching.

1025 UTC the Captain conducted a missed approach from runway 29. He had repositioned the aircraft for another approach to Runway 29 and despite flying below the MDA the crew did not sight the runway. The Captain then flew the aircraft out to sea to the West and he levelled the aircraft to position for the ditching. The Captain reported that he selected full flap, gear up and slowed the aircraft on instruments to 100 knots airspeed whilst the Co-pilot read out the radio altimeter height as they approached the water. The aircraft lights were switched on, however the crew never sighted the sea surface and the aircraft ditched in the sea at approximately 1026 UTC.

NOTE: *The actual flight time from Apia to Norfolk was approximately 255 minutes (4 hours 15 minutes).*

1.2 Injuries to persons

The Co-pilot sustained bruising to the chest and cracked ribs.

The flight Nurse sustained minor bruising to the legs.

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	0	0	0
Minor/None	1	1	

1.3 Damage to aircraft

The forward door was damaged in the impact sequence and could not be opened. The forward fuselage was cracked in the impact sequence just forward of the wing attachment points. The aircraft sank in about 47 metres of water. Underwater footage, taken from a remotely operated underwater camera of the aircraft revealed that the forward cabin had separated from the main structure just forward of the wing attachment area.

1.4 Other Damage

Nil

1.5 Personnel information

1.5.1 Captain

The Pilot in Command, Captain Dominic James, ARN: 519777, holds an Airline Transport Pilot Licence (ATPL) issued on the 11/10/2002 and a Class 1 medical certificate valid to 23/01/2010, vision correction required. He held a valid command instrument rating and was issued with a command endorsement for the Westwind in July 2007. He had joined Pel-Air in 2005 and the company training records indicate that he flew first as a co-pilot on the Westwind. He was checked to line as a Captain on the Westwind during November 2008.

1.5.2 Licence

The Captain's licensing records indicate that he had some difficulty in passing examinations in order to complete his ATPL licence between 1997 and 1998. The records show that he subsequently passed the subjects at one sitting in 1999.

1.5.3 Training Records

His training records held by the operator indicated he had a number of deficiencies recorded during check flights and had failed a captain's check to line assessment flight on 28/6/2008. He was then required to carry out further flights under supervision before being checked and authorised as a captain on the Westwind aircraft. Areas of difficulty during check flights were listed as:-

Flight planning

Asymmetric flight

Flap failure recognition.

1.5.4 Flight Sydney to Norfolk

CASA obtained a recording of the conversation between the aircraft and Auckland ATC. This revealed that during the flight from Sydney to Norfolk Island and prior to top of descent the Captain received a weather report generated from the automatic weather station at Norfolk Island, which indicated that the weather at Norfolk was broken cloud at 500 feet and overcast cloud at 800 feet. This placed Norfolk Island below landing minima; however a comment from the Auckland air traffic controller indicated that the weather at Norfolk was reported to be better than the automatic report from the weather station.

The flight plan indicated that an alternate had been planned for and this was Noumea (Tontouta). Full fuel had been loaded in Sydney and this was sufficient to fly to Norfolk and conduct an approach and then divert to Noumea. The Captain elected to continue to Norfolk and made a successful landing. The weather he observed on the ground at Norfolk was better than that reported by the automatic weather report. During his arrival the next day approaching Norfolk he asked the Unicom operator to go out to the runway to observe the actual weather rather than believe what the "Robot" weather station was reporting.

1.5.5 Interview

As part of the accident investigation, the Captain was interviewed and questioned on aspects of the flight, including flight planning, enroute weather information and contingency planning.

1.5.6 Fatigue

The Captain was questioned with regard to fatigue calculations during preparation and the rest arrangements in Apia. The Captain said words to the effect that he was aware that the company conducted an in-house Fatigue Analysis Interdyne (FAID) calculation and the aircraft commander was told the score and if it was OK to commence the flight. A rest period in Apia of about 10 hours was expected and this raised no issues with the FAID score.

However he said words to the effect "When we arrived in Apia there was a car (mini bus) waiting. There was some confusion about our arrival so we decided to refuel later.

We went to the hotel which is at the end of the runway. When we arrived the rooms weren't ready so we all sat round in the sun. When I went to the room it was bright even with the curtains drawn. I tried to sleep but was disturbed by room service and a phone call. I slept for about four hours in total. I had set the alarm on the phone to give me half an hour to do the flight planning."

1.5.7 Flight Planning

The Captain did not report that he felt fatigued when he awoke nor when he commenced flight planning which was carried out on the his cellular phone in the lobby of the hotel. He reported that the internet service was inoperable in Apia so he could not access his computer for flight information. He had no maps or charts as these had been left in the aircraft so when he telephoned the Brisbane ATC briefing office, in the absence of any detailed information, he attempted to reverse his outbound flight plan.

When questioned about what contingencies he took into account during fuel planning he said words to the effect, "The flight from Norfolk to Apia was about three hours and we had a tail wind. I knew we would have a head wind on the way back to Norfolk so I estimated a three and a half hour flight. I calculated full wing fuel would be sufficient. You suffer a performance penalty the more fuel you carry. With less fuel you can climb to high altitude quicker and this gives better access to the upper level airspace. There is the added cost carrying extra fuel which is cheaper in Sydney".

During flight preparation at Apia the Captain supervised the refuelling of the aircraft and elected to refuel the fuselage and wing tanks, leaving the tip tanks empty. This was the first time that he had done this and the company fuel records showed that on previous flights from Apia to Norfolk conducted by the Captain he had left Apia with full fuel. When questioned with regards to fuel planning on this occasion the Captain explained that carrying full fuel meant that there was a performance penalty and he had found from previous experience that if he were able to climb to high altitude quickly then he was more likely to request and be granted a flight level of 39000 feet. On one previous occasion ATC had kept him at a lower altitude and this adversely affected the engine fuel consumption figures. The aircraft was not RVSM approved and access to upper level airspace is dependant on traffic and is at ATC discretion.

When questioned about the company procedures for calculating possible diversion to an alternate enroute he said words to the effect, "This is in the operations manual; there is a rolling calculation which is written down. The manual supplies some formulas for the calculations and other information of a basic nature. I did the calculations - not every half hour but at regular intervals all the time".

1.5.8 In flight decision making

When asked to describe the weather update he obtained from Auckland and what influence it had on his decision to continue on to Norfolk Island the Captain said words to the effect, "I asked for the weather from Auckland which is available just past the hour and half hour. We had the latest weather one hour out from Norfolk. I can't remember the details but I knew we would have some work to get in. The previous night the automatic weather report was not that good but when we got there you could see stars. One of the aerodrome staff at Norfolk told me that the automatic weather station overstates the level of cloud cover. I got weather reports at least three times. I can't remember at what point I obtained the weather for Norfolk, or at what point I made my decision to commit to a landing at Norfolk".

When asked about the final decision point for a diversion or to continue on with the flight from Apia to Norfolk the Captain said words to the effect, "I did the fuel calculation process, can't tell you the exact point, I was talking to Nadi and getting information. There was another aircraft around a Galaxy I think. I don't recall getting weather from Nadi. Our enroute ground speed was fluctuating and our ground speed reduced I knew the weather was available five minutes past the hour and obtained that, but did not make a decision on a diversion at that point. I assessed the weather all the time. I don't know what the last diversion point was. I didn't make a decision on that but I did get the weather at least three times. The fact that I obtained the weather at any given point in time does not necessarily mean that I was making any decisions regarding the need to divert or not – regularly obtaining the weather is part of my regular routine when I fly".

The questions at interview with the Captain of the aircraft were framed with his decision making ability in mind. The Captain was queried about the point on the flight where he received the weather reports which showed that the destination weather had deteriorated below alternate minima and the procedure detailed in the operations manual requiring in-flight fuel checks. The Captain was also asked about the last divert time point which is also covered in the operations manual, and the decisions he made in relation to the last divert point. The Captain did not relate the two together and was not able to articulate that a decision was required to be made in relation to the deteriorating weather at destination and the last chance to divert to an enroute alternate aerodrome.

1.5.9 Co-pilot

The Co-Pilot, Zoe Louise Cupit, ARN583132, holds a Commercial Pilots Licence issued on 07/09/2004, and a Class 1 medical certificate valid to 8/4/2010, vision correction required. She held a valid command instrument rating and was issued with a command endorsement for the Westwind in January 2008.She has flown the Westwind aircraft for approximately 650 hours.

1.5.10 Licence

The Co-pilots records were assessed and there is nothing to indicate any difficulties in obtaining her Commercial pilots licence.

1.5.11 Training Records

The company training records show that during command training she was assessed as not yet ready for command and was checked to line flying as a first officer in Mach 2009. It was recommended that she conduct flying in command under supervision (ICUS) where possible before a return to command training was resumed.

As part of the investigation, the Co-pilot was interviewed and questioned on aspects of the flight, including flight planning enroute weather information and contingency planning.

She explained that she could not remember much about these aspects of the flight, possibly due to being dazed during the accident sequence, she does recall that the operator has detailed procedures in the operations manual and she is familiar with those although she believes particular aspects of the flight are related to captain's responsibilities.

She confirmed that she was the pilot flying on the flight from Apia to Norfolk and that she flew the fist approach to Runway 29 on arrival at Norfolk Island.

1.6 Aircraft information

The aircraft was manufactured in 1983 by Israel Aircraft Industries in accordance with the FAA Type Certificate Data Sheet No A2SW. It was first registered in Australia on 25 January 1989. An Airworthiness Certificate in the Transport category was issued 6 March 1989.

The aircraft was subject to regular maintenance and had a maintenance check on 6 November 2009 at 21,516 airframe hours. A Maintenance Release Certificate was issued at that time and was valid at the time of the accident. The total hours for the aircraft at the time of the accident were approximately 21,528 and maintenance was not considered to be an issue in the accident.

1.7 Meteorological information

It is a fundamental duty of the pilot in command of an aircraft to appropriately plan his intended flight after making a careful study of all relevant information appropriate to the intended operation – see CAR 239. For Instrument Flight Rules (IFR) flights and all flights away from the vicinity of an aerodrome, the pilot must at a minimum have regard to current weather reports and forecasts for the route to be flown and the aerodromes to be used.
Aerodrome Forecasts are generally accessed through Airservices Australia (Airservices) in the form of a Terminal Area Forecast (TAF) for the destination aerodrome (and any applicable alternate). Route forecasts are also generally sourced from Airservices in the form of an Area Forecast (ARFOR) covering the route to be flown.

The Captain had obtained a TAF weather forecast prior to departure from Apia. This showed that Norfolk Island weather was above the required minima for a landing at the time the aircraft planned to arrive in Norfolk. The trend showed that the weather at Norfolk would deteriorate but not until 5 hours past the flight expected arrival time.

Other weather information which was relevant to the flight, was a forecast known as route sector winds and temperature, detailing the strength of the prevailing high level winds along the route to be flown. Such a forecast is essential to determining the fuel requirements for flight. Information regarding the prevailing winds is also available from Airservices in the form of a table which sets out the direction and speed of the winds at different altitudes along the route to be flown. This information was not requested by the Captain.

During the flight planning process the internet was not working in Apia, the Captain phoned his flight notification through to the AUSFIC Brisbane briefing office at 0430 UTC on 18 November 2009. The transcript of the taped conversation obtained during the investigation revealed that the Captain was not fully prepared to communicate his flight plan details to the briefing officer. It was evident without the assistance of the Airservices computerised National Aeronautical Information Processing System (NAIPS) the Captain did not appear to possess the knowledge or have an appreciation of the requirements for International flight planning as evidenced by his conversation with the AUSFIC Brisbane briefing officer.

The briefing officer had a difficult time in extracting the minimum flight planning information from the Captain. On coaxing from the briefing officer the Captain asked for the TAF for Norfolk Island. That was the only operational information the Captain requested from the briefing. The Captain did not request any significant weather / route winds or weather for possible alternates for the route. The transcript demonstrates that the only weather information which the Captain sourced prior to the flight to Norfolk Island on 18 November 2009, was the TAF for Norfolk Island Aerodrome.

This TAF was incomplete as the Captain did not attempt to obtain either the trend details or the temperatures and QNH although this information was offered by the briefing officer. These are also critical aspects of a TAF because they allow the pilot to gain an appreciation of the expected trend in the weather (i.e. deteriorating or improving) and to determine whether there is a likelihood of encountering fog or other significant weather phenomena upon arrival at the destination.

The Airservices briefing officer could have provided essential weather data over the phone, such as an AFOR, or Route Sector Winds, or the Captain could have arranged for the AFOR and Route Sector Winds to have been faxed to him at the hotel where he was staying in Samoa. This was not done.

The valid TAF for Norfolk Island at the time of departure from Apia did not require an alternate for weather purposes. The captain at interview stated that he calculated that full wing tank fuel would be sufficient for the flight.

1.8 Aids to navigation

The aircraft was navigated by dual Apollo 2101 GPS units, dual VOR, ADF and DME.

1.9 Communications

Good HF communications were established with ATC at Auckland Oceanic Control. Communications were also established using HF radio with ATC in Fiji. Once in range VHF radio communications were established with Norfolk Island Unicom.

1.10 Aerodrome information

Norfolk Island Airport is located at S20.02.6 E167 56.3. The main runway 11/29 is 1950 meters, and the secondary runway 04/22 is 1435 meters. Both runways are sealed. The aerodrome is equipped with VOR, NPA and RNAV/GNSS approaches for the 11/29 runway. Runway 11/29 is equipped with the following lights- MIRL, REIL, PAPI. Runway 04 is equipped with VOR and RNAV/GNSS approaches and is equipped with the following lights- RL, REIL, PAPI-R and approach lightning. Runway 22 is equipped with VOR and RNAV/GNSS approaches with RL lightning.

1.11 Flight recorders

The aircraft was fitted with a cockpit voice recorder (CVR) and a flight data recorder (FDR). Due to the depth of the water in which the wreckage lays the ATSB have elected not to recover the FDR and CVR.

1.12 Wreckage and impact information

The aircraft is located at position 250°T at 5km from Norfolk aerodrome. The ditching was carried out in darkness with very low cloud and mist preventing any visual reference to the surface of the sea. The ditching was carried out using on board instruments for reference .The Captain brought the aircraft to within 50 feet of the sea surface using the radio altimeter for guidance; he then slowed the aircraft as much as possible by raising the nose. The crew reported that there were three impacts as the aircraft made contact with the sea, the first quite severe involving a vertical component and a lateral deceleration component. The second and third contacts were relatively slow and the aircraft settled on the sea surface with an initial slight nose down attitude.

1.14 Fire

There was no fire

1.15 Survival aspects

1.15.1 Seating arrangements and safety equipment

The aircraft seating configuration included the Captain's seat on the port side and Co-pilots seat on the starboard side, these were separated from the cabin by a bulkhead and door, a passenger seat was located just aft of the main exit door on the port side where the patients partner was seated, the Doctors seat was located just aft of the port emergency exit. The patient was located on a stretcher adjacent the starboard emergency exit and the nurse was seated behind the stretcher on the rear cabin bulkhead seat. There were life jackets for all on board and spare life jackets were carried. There were two life rafts located in the aircraft cabin.

1.15.2 Impact sequence

The Captain reported three impacts with the sea during the landing sequence. When the aircraft stopped it was in a slight nose down attitude and water had filled the cabin to knee height. He reported that he checked the co pilot who appeared to him to be OK and made his way aft to the port exit. He reported that although this was partially submerged it opened easily and he observed the Doctor opening the starboard exit at which point the Captain elected to exit through the now open port exit, which was becoming submerged under water.

The Doctor attending the patient advised that the aircraft made two significant impacts with the water before coming to rest. The Doctor said they were given approximately 90 seconds notice by the crew of their intention to ditch the aircraft. This was disputed by

the Co-pilot who believed that the Doctor was advised of the intention to ditch the aircraft after the second go around attempt was made.

The Doctor was able to prepare the cabin for ditching, he advised the patient's partner and nurse to put their life jackets on and to adopt the brace position. The Doctor had insufficient time to prepare the patient apart from ensuring her harnesses were secure. He was also able to relocate the life rafts near the emergency exits. He was able to brace himself using the portable oxygen rack stowed in front of him. Once the aircraft came to rest in the sea it began filling rapidly with water. He recalled the Captain was out of the cockpit quickly and made his way to the port emergency exit. He observed the Captain open the port exit and swim out to the sea surface. The port exit was now under water at this time so the Doctor elected to exit the aircraft via the starboard side which he opened and discarded. The Doctor assisted the patient through the emergency exit, followed by the nurse who had assisted in unbuckling the patient's stretcher straps. The Doctor reported that he was not injured however the nurse sustained soft tissue bruising to her legs. Neither of the two life rafts was deployed from the aircraft.

The Doctor reported that three people were able to don life vests and the group congregated on the sea surface near the sinking aircraft. There was an estimated seven foot sea swell but no foam on the crests of the waves indicting fairly light wind conditions. After about an hour and forty minutes the survivors were rescued from the water by a boat sent out from Norfolk Island to search for them. The survivors were taken by the boat to Norfolk Island and transferred to shore by crane due to the prevailing sea conditions. They were then taken to hospital where their injuries were assessed, all had survived with either no or minor injury apart from the Co-pilot who sustained cracked ribs and bruised sternum.

The Co-pilot reported that prior to the ditching she turned on the emergency cabin lights and briefed the Doctor that they were running out of fuel and were going to have to ditch the aircraft. She then concentrated on helping the Captain prepare for ditching and read out the radio altimeter heights as the aircraft descended towards the sea. During the impact sequence she was stunned by a blow to the chest from the control yoke, this caused severe pain and bruising to her chest. She recalls being dazed by the blow and when she came to her senses the cabin was in darkness. She was still strapped in her seat by the full harness and the cabin was full of water to chest height. She unbuckled her harness without difficulty and made her way aft to the main door. She could not open this and the water level was nearly at her head height. At this point she felt for the roof panel overhead and made her way aft under water to the first window. Her progress was restricted by cabin baggage floating submerged in the cabin roof area. She found the first window and continued aft until she found the open port window exit which was completely underwater. She swam through the exit and surfaced alongside the doctor who was wearing a life jacket. He rendered assistance to the Co-pilot who had not been able to don a life jacket. Three people were wearing life jackets the Doctor the Nurse and the patients partner. The crew reported that they were unable to don their life jackets as they were preoccupied with ditching the aircraft.

1.16 Tests and research

Nil

1.17 Organisational and management information

The flight was conducted by Pel-Air Aviation Pty Limited. At the time of the accident Pel-Air held Air Operator Certificate number 1-1VAV2-03. This was issued on the 05 June 2009 and was valid to 30 June 2012. The AOC authorised the holder to conduct Regular Public Transport, Charter and Aerial Work operations. The Company was headed by the CEO as Director and nominated senior person. The company employed a chief pilot and a number of pilots. The company is overseen by the Bankstown office as part of CASA Operations and was last audited by the Bankstown office staff during February 2009.

Following the accident the Bankstown office conducted a special audit of the Pel-Air Air Operator Certificate coincident with the aircraft accident investigation and a number of issues relevant to the accident were identified. These are as follows:-

1.17.1 Fuel Policy and Practice

- Inadequate fuel policy for Westwind operations.
- Pilots use their own planning tools and there is no control exercised by Pel-Air Aviation Pty Limited to ensure the fuel figures entered are valid.
- No policy exists to ensure that flight and fuel planning is cross-checked to detect errors.
- No alternate requirements specified for remote area and Remote Island operations.
- The Operations Manual specifies 30 minute fuel checks – this appears to be largely ignored by operating crew.
- Criteria to obtain weather updates not specified in Operations Manual.
- Practice of obtaining weather varies among pilots and does not appear to be conducted at appropriate times to support decision making.
- No consideration of loss of pressurisation and an engine failure.

1.17.2 Operational Control

- No operational decision-making tools provided to support crew in balancing aviation versus medical risks.
- Once tasked, the pilots operate autonomously and make all decisions on behalf of the AOC. The AOC exercises little, if any, control over the operation once a task commences.
- The company does not provide domestic charts or publications to pilots and does not ensure that the pilots maintain a complete and current set.
- In many cases inadequate flight preparation time is provided. (Normally pilots are notified two hours prior to departure regardless of when the company becomes aware of the task).

- Failure to maintain required flight records and no apparent checking by the company.
- Pilots use their own planning tools and there is no control exercised by Pel-Air Aviation Pty Limited to ensure the data entered is valid.

1.17.3 Training

- Inadequate CAO 20.11 training (life raft refresher and emergency exit training deficient).
- Inadequate documentation of training programs.
- No formal training for international operations.
- Inadequate training records for pilot endorsement and progression.
- Inadequate records of remedial training.
- Endorsement training is the minimum required (five hours) and relies on regular operations to consolidate training.
- No mentoring program for First Officer to Command.
- Deficiencies in training records identified.

1.17.4 Fatigue Management

- Over-reliance on FAID as the primary fatigue decision making tool.
- Inadequate adherence to FRMS policy and procedures.
- Excessive periods of 24/7 standby.
- Lack of FRMS policy regarding fatigue management for multiple time zone changes.
- Fatigue hazard identification, risk analysis, risk controls and mitigation strategies not up- to-date and documented. (Advice provided during the FRMS review indicates that Pel-Air Aviation Pty Limited considers the ad hoc aero-medical operations to be its highest fatigue risk and yet there is no recent documented evidence to confirm these risks are being actively managed).

1.17.5 Drug and Alcohol Management

- Failure to ensure that drug and alcohol testing is conducted after an accident or serious incident.

These issues have resulted in requests for corrective action being directed to the company and management plans to address, these have been implemented.

1.18 Additional information

1.18.1 Chief Pilot Interview

The company chief pilot was interviewed the day after the accident. He explained that the company operations manual contained a number of procedures to be followed by company pilots when carrying out their flying duties.

Operations manual sections of interest to the investigation were the procedures listed at:-

(a) Para 9.11.1(b) – fuel planning

(b) Para 9.11.5 – calculation of last diversion time

(c) Para 8.5.2.2(b) – last possible diversion point weather check

(d) Para 1.2.8 – responsibility of pilot in command.

1.18.2 Fatigue Management

The chief pilot also noted that the company operates an FRMS. This program examines a number of factors and gives a score which predicts whether any particular flight will produce levels of fatigue which would not be acceptable for the crew to continue to fly.

The crew on the accident flight were assessed as fit to fly using the predicted and planned flight and duty times and planned rest periods during the stop in Apia.

The planned roster had FAID scores for the captain and first officer of the accident flight as follow:

17 November 2009, Depart 22:00, Arrive 06:30, Daily Hours 8.5, FAID score 27.9

18 November 2009, Depart 14:00, Arrive 03:30, Daily Hours 13.5, FAID score 50.7

All times are in relation to the time in Sydney

There was no evidence to support any updates to the FAID score based on actual sleep or use of the IFLS. Even with these updates the companies use of a sore of 75 to determine if a pilot is fit to fly is not appropriate as scores need to be determined based on closer examination of the roster patterns themselves i.e. regular RPT during the day is not the same type of operation as ad hoc medivac operations and scores should be varied according to task complexity, workload (physical and cognitive) and risk.

Coincident with the accident Investigation and as part of the Special Purpose Audit of Pel-air the FRMS was evaluated with the following result:-.

- A problem with Rex/Pel Air's use of the FRMS and FAID was that no one had a sufficient understanding of FAID, in particular the limitations and assumptions used within the algorithm. Hence, there was not a good understanding of the forecast sleep by the model in determining the fatigue score, an option which is available on some versions of FAID.
- Other systems based evidence supports the finding that the Pel Air FRMS had a heavy reliance on FAID prior to the accident and that FAID scores became the primary means for making a 'fly/no fly' decision. There was evidence to support direct violations of the FRMS processes and policies (as per the FRMS report), which further suggests that work arounds were the norm to achieve operational needs to the detriment of fatigue management.

1.18.3 Fuel Planning

It is a regulatory requirement for the pilot in command of an aircraft to ensure that a flight does not commence unless he has taken reasonable steps to ensure that the aircraft carries sufficient fuel and oil to enable the proposed flight to be undertaken safely. *(Subregulations 233(1)(d) and 234 of the Civil Aviation regulations 1988)*

An appreciation of the strength and direction of the prevailing high level winds along the proposed route is critical to fuel planning, since the duration of a flight can vary significantly if it is conducted into a strong headwind, or tailwind.

In the absence of any information about the strength and direction of the prevailing winds expected en-route, any estimate of the expected duration of the intended flight becomes little more than an imprecise science. An accurate determination of flight time is critical in circumstances where the expected duration of the flight is one of the key factors taken into account in calculating the required fuel load.

The transcript of the conversation between the Captain and the Brisbane briefing officer prior to commencing the flight from Apia revealed that the Captain estimated the flight time to Norfolk to be 3 hours and 30 minutes. The distance between Apia and Norfolk Island is 1455 nautical miles. When this is divided by 3 hours and 30 minutes this give a ground speed of 416 nautical miles per hour (Knots). This equates to the normal true cruise airspeed of the Westwind aircraft and indicates that the estimated flight time given to the Brisbane briefing office made no allowance for wind considerations. . Information obtained by CASA from the Bureau of Metrology indicted that upper level wind speeds expected along part of the route to be flown were between 80 to 90 knots from a Westerly direction at 39000 feet.

The transcript of the conversation with Auckland ATC reveal the times at the reporting points enroute, from this information it was possible to estimate the ground speed of the aircraft and this indicates that the actual wind speed experienced at the aircraft cruise altitude of 39000 feet varied as the flight progressed and for the latter part of the flight were in the region of 70-80knots headwind. The net result is a cruise mean headwind component of 60 knots Apia to Norfolk.The time taken to fly from Apia to Norfolk was 4 hours and 15 minutes which significantly increased the fuel required to safely complete the flight.

Fuel planning must ensure that sufficient fuel is up-lifted to cater for any event which may be encountered en-route to the destination, including loss of pressurisation or loss of an engine combined with a pressurisation malfunction either event resulting in the aircraft having to descend to 10,000 feet, which would result in significantly higher fuel usage.

The captain must also consider a forced diversion due to unexpected circumstances that could have arisen for many reasons other than 'destination weather'. e.g. a vehicle breaking down on the runway at Norfolk, the failure of the lighting system or aids to navigation and landing. For the flight to comply with CAR 234(3)(c)(i) the pilot would have to consider these circumstances and carry enough fuel to divert to an alternative aerodrome if one of the forced diversion scenarios presented. These calculations appear not to have been considered.

The Captain was also required to take into account the fuel planning requirements set out in the Pel-Air Operations Manual (OM) in determining how much fuel would be require in order to conduct the flight from Samoa to Norfolk Island.

In accordance with paragraph 9.11.2 of Part A the OM, prior to take-off the Captain was required to calculate a critical point between two suitable aerodromes, being a point from which it would take the same time to fly to each aerodrome. In the case of the planned flight between Samoa and Norfolk Island, the suitable aerodromes varied as the flight progressed along its route; these being initially either Tonga or Nadi and finally Tontouta (Noumea).

The above calculations would have provided the Captain with the knowledge of which airport was closest in terms of flight time at any point during the progress of the flight. This information is critical for determining a course of action in the event of an emergency situation such as engine failure, destination aerodrome closure due to weather etc. Once the above calculations are complete, the flight crew are then required to ensure that sufficient fuel is uplifted to meet the worst case scenario which may be encountered during flight.

The Westwind W1124 aircraft type is equipped with tip tanks, wing tanks and fuselage tanks. The Captain elected to fill only the wing tanks and fuselage tanks providing some 7300 pounds of fuel for his intended flight. This figure was 1500 pounds of fuel less than the total fuel uplift capacity of the aircraft which is 8800 pounds. There were no weight and balance limitations associated with the intended flight and even carrying full fuel the aircraft would have been below its maximum all up weight limit.

Scenarios for consideration during this flight are the loss of pressurisation with two engines running and the loss of an engine during flight complicated by loss of pressurisation, either event requiring descent to 10000 feet altitude at the critical point, which was 50 nm past reporting point Dolsi, between Nadi and Norfolk Island (Tonga, Apia and Tontouta at this time are out of range).

Using the data available to the Captain at the time of planning the flight, CASA has calculated that insufficient fuel was carried to cover the worst case scenario. In other words, there were critical points throughout the flight which placed the aircraft at such a distance from the departure point, the intended destination and any enroute aerodromes that, if the aircraft had suffered a depressurisation with two engines running or an engine failure coupled with a depressurisation, the aircraft would not have had adequate fuel to reach any aerodrome with the required reserves intact.

In accordance with paragraph 9.11.3 of Part A of the OM, the Captain was also required to calculate a point of no return (PNR) which is a point along the route at which the aircraft can return to its departure point or suitable alternate aerodrome and arrive with statutory fuel reserves intact, or once past this point, must continue on to its destination. This information is used by the flight crew to determine an appropriate course of action in the event of an emergency which requires instant decision as to whether it is possible to return to point of departure, or to continue on to destination, or a suitable alternate.

Statutory reserves of fuel for the Westwind aircraft are:

(a) a fixed fuel reserve equal to 30 minutes at the fuel usage rate of 1200 pounds per hour. (30 minutes @ 1200 pounds per hour) 600 pounds;
(b) a variable reserve of 10% of total flight fuel (Operations Manual requirement).

Based on information available from the ATC transcripts, the PNR based on a diversion to Nadi, was reached at 0846 (43 nm past reporting point Dolsi). At this time the Captain had the option of diverting to Nadi or continuation to Norfolk Island. Once the flight continued past this point, the option of a diversion which would have allowed a landing at Nadi with statutory reserves of fuel intact was lost. For decision making purposes at that stage, once past this PNR, the only option available for a landing with reserves of fuel intact was the destination as both Noumea and Tonga were at that time out of range.

A weather report for Norfolk Island, passed to the aircraft by Nadi at 0801 indicated that the destination now required an alternate aerodrome due to overcast cloud base at 1100 feet, which was below the applicable minima at which an alternate aerodrome is required for flight planning purposes. However, no diversion appears to have been considered by the crew and the flight continued on to its intended destination past the PNR based on a diversion to Nadi. The 0801 weather report also showed a difference of 2 degrees (21/19) between the current temperature and the dew point.

Part A of the operations manual at Paragraph 9.11.5 requires that where a successful approach and landing at a planned destination appears marginal because of weather or any other reason, the pilot in command must determine the last time at which the aircraft can be diverted to an alternate aerodrome. Once this point is reached if the situation at the destination aerodrome remains unchanged, the flight must then divert. The latest divert point must be calculated so as to allow the aircraft to land at the selected alternate aerodrome with the fixed fuel reserve intact.

1.18.4 Weather updates received in-flight

The Captain received an in-flight weather report at 0801 which indicated that the weather at Norfolk Island had deteriorated below the minimum conditions which required the holding of an alternate aerodrome. The weather report indicated only a very small difference of 2 degrees between the current temperature and the dew point (21/19).

At 0904, Auckland provided the flight with an updated weather report for Norfolk Island. This report again indicated that an alternate aerodrome was required. The weather report showed that the separation between the current temperature and the dew point was now 1 degree (20/19). This weather report also showed that visibility had decreased from 10 kms to 7 kms.

At this time from calculations based on the ATC transcripts, CASA has determined that the Captain could have diverted the aircraft to Noumea (and landed with fixed reserves of fuel intact) given the then remaining on board fuel. However, diversion was not commenced and at 0911 the latest divert time for Noumea was reached and passed. At 0932 a further weather report for Norfolk Island was passed to the flight indicating further deterioration in the weather at Norfolk Island. This report noted severe deterioration at Norfolk Island and indicated significant cloud below the approach minimum .Based on this report the aerodrome was not available for landing.

This last weather report was received prior to top of descent at approximately 125 nautical miles from Norfolk Island, and fuel remaining at that time was not sufficient to divert to any other airport and arrive with fixed reserves intact.

However, even at this point in the flight a diversion to Noumea was still possible, although the aircraft would have landed with less than fixed reserves of fuel intact. Diversion to Noumea would have required a flight time of approximately 65 minutes which would have resulted in arrival Noumea with less than fixed reserves; only 200lb of the required 600lb would have been used. The Captain however chose to continue on to Norfolk Island, with the knowledge that a landing would be most difficult under the prevailing conditions.

The pilot in command's duty to ensure the safe continuation and end of the flight is given effect in Part A of the Pel Air OM, paragraph 8.5.2 of which requires the pilot in command of international operations to conduct regular in-flight checks of the fuel remaining. These checks are to be carried out at the end of each leg or every 30 minutes, whichever is the earlier.

The results of the fuel check are to be used to determine whether the fuel remaining is sufficient to complete the flight, and to determine the expected fuel remaining on arrival. If at any time these fuel calculations show that current fuel reserves are inadequate to permit continued flight to the destination, the crew must act to divert to a suitable alternate aerodrome.

Paragraph 8.5.2.2 of the OM provides that the PIC must ensure that the amount of usable fuel remaining in-flight is not less than the amount required to proceed to an aerodrome where a safe landing can be made with fixed reserves of fuel intact. Part of this procedure requires that the expected weather conditions at the destination are assessed.

The OM also requires the pilot in command to update his critical point and PNR calculations in-flight.

The crew of VH-NGA received two weather reports for Norfolk Island aerodrome which indicated the requirement of an alternate aerodrome. (0801 and 0904). At the time these weather reports were received by the crew, Nadi and Noumea respectively were available as alternate aerodromes, and fuel reserves existing at these times would have permitted flight to these aerodromes to arrive with fuel reserves intact.

Once the flight had reached its cruising altitude, fuel calculations based on the up-dated ground speed and fuel usage rated should have revealed to the Captain that the fuel reserves were not sufficient to permit arrival at destination followed by a diversion to an alternate aerodrome. Rather, the decision to divert if such an event became necessary as indicated by the weather reports of 0801 and 0904, would need to be taken en-route.

The fuel reserves on departure from Apia did not consider the worst case scenario and resulted in moments during flight when fuel reserves would have been insufficient to reach any aerodrome if the aircraft had suffered an engine failure coupled with a depressurisation.

When the Captain received the subsequent weather report at 0904 UTC which continued to show that the weather conditions at Norfolk Island were below the alternate minima, the aircraft was past its last PNR based on a return to Nadi, however Noumea was now in range as the last possible diversion alternate. This is a key decision point as Noumea would only remain in range with required fixed reserves intact until 0911 UTC. The provisions of paragraph 8.5.2.2 of the OM and the deteriorating trend in weather conditions meant he should have diverted the aircraft to an alternate aerodrome where weather reports indicated that a successful landing could be made.

If the Captain had diverted the aircraft upon receiving the weather update at 09:04 UTC, calculations show that the aircraft would have had sufficient fuel remaining to have reached Noumea. Reported weather observations for Noumea obtained by CASA show that weather conditions at or around the time when VH-NGA could have been expected to arrive (if diverted), would have been such that a successful landing could have been made. The Captain did not asked for any other weather information other than for Norfolk indicating that diversion to an alternative destination was not under consideration at any point of the flight.

At 0932, when the Captain received a weather report which indicated to him that Norfolk Island would be unavailable due to weather, it would have been an option for him to have diverted the aircraft to Noumea – even though this would have involved a landing with less than the fixed reserve fuel on board, this is considered to be a better option than continuing (with minimal fuel reserves on board) to a destination, the weather at which was below landing minima.

1.18.5 Legislation

1.18.5.1 Minimum Fuel for island destination

The requirements in Civil Aviation Order (CAO) 82.0 para 2.3 generally apply to all types of operations including aerial work - para 1.1 of the Order.

If an operator has a fuel policy in their operations manual para 2.3(a) is only applicable if the policy describes the minimum amount of fuel that should have been carried for the flight in question - namely, to a remote island such as Norfolk Island. If it did not, then paragraph 2.4 of the Order would apply. However, these paragraphs are in the definition part of the Order and have no operation in their own right. They are there to give meaning to paragraph 3A.1, which only applies to charter operations to a remote island; they do not apply to aerial work operations.

Paragraphs 2.3 or 2.4 did not apply as the accident flight was classified as an Ambulance flight which is documented on the Air Operator Certificate as Aerial Work.

1.18.5.2 CAR 234 Considerations

CAR 234(1).Undertaking a flight must mean completing that flight, so that anything the pilot takes into account at the commencement of the flight (in relation to fuel and otherwise), must prospectively contemplate the entire flight, and such circumstances as may reasonably be expected to arise at any point in the course of the entire flight, including probable changes in the weather, of the specific nature and implications of which the pilot not know with absolute certainty at the time the flight commences. This must involve more than merely a consideration of what the weather is known to be at the moment the flight commences.

A corresponding obligation in essentially the same terms is imposed on the operator in CAR 234(2).

Significantly, CAR 234(3) provides that, for the purposes of both subregulation (1) and (2), in making a reasonable determination of the sufficiency of fuel required for a flight, both the pilot in command and the operator are expected to consider (as a court will be obliged to consider collectively, amongst other things:

- the meteorological conditions in which the aircraft is, *or may be required*, to fly [CAR 234(3)(b)];
- the possibility of a forced diversion to *an alternative aerodrome* [CAR 234(3)(c)(i)];
- the possibility of *both* a *loss of pressurisation* and the *loss of an engine* [CAR 234(3)(c)(iv) and (v); and
- Any guidelines issued from time to time by CASA for the purposes of this regulation [CAR 234(3)(d)].

The expression used in CAR 234(3)(c)(i) is an *alternative aerodrome*, which is not defined in the regulations, and may arguably contemplate something other than an '**alternate aerodrome**', which is defined in the regulations to mean: 'an aerodrome *specified in the flight plan* to which a flight may proceed when it becomes inadvisable to land at the aerodrome of intended landing' [CAR 2(1)].

There may be one or more *alternative aerodromes* potentially available to a pilot, to which a forced diversion may need to be considered for the purposes of CAR 234(3)(c)(i), but which are not (are not necessarily and/or are not necessarily required to be) identified as 'alternate aerodromes' in the flight plan. Even if the pilot were not otherwise *required* to 'carry an alternate aerodrome' for this particular flight, he (and the operator) are still required to consider the possibility of a forced diversion to an alternative aerodrome, for the purposes of determining the sufficiency of fuel to be carried on board the flight.

1.18.5.3 In-flight monitoring

The pilot in command is responsible for the start, continuation, diversion and end of a flight by the aircraft, and for ensuring the safety of the aircraft during flight time. The pilot

in command, must discharge his duty in accordance with the requirements of the legislation and operations manual provided by the operator. *(Subregulations 215 (9) and 224(2) of the Civil Aviation Regulations 1988).*

Receiving regular updates of the weather conditions at the intended destination is a necessary part of the pilot in command's duty to ensure the safe continuation and end of the flight. This is so even where (as was the case here) the TAF for the intended destination indicates that a landing will be possible and that there is no requirement to plan for an alternate aerodrome.

1.18.5.4 Potential deficiencies in knowledge, skill and competency

It is a fundamental part of the training of commercial and airline transport licence holders, to thoroughly plan and then continually monitor the conduct of a flight to ensure that sufficient options remain open to the flight crew to deal with a worst case scenario. In other words, commercial and airline transport pilots are trained to avoid situations such as that experienced in VH-NGA on 18 November 2009.

It is considered to be a serious professional error, to be left in a position where an emergency landing has to be made in an otherwise airworthy aircraft due purely to the fact that the aircraft has run out of fuel.

The Captain should have been aware by 0904 that continued flight to Norfolk meant that he would arrive at his destination with minimal fuel reserves in circumstances where the weather reports indicated a strong possibility of marginal conditions, and with no alternate options.

The fact that he did not divert the aircraft at that point indicates that the Captain was potentially:

(a) Unable to accurately perform the necessary fuel calculations, or was unable to understand the significance of the results of those calculations for ongoing safety of flight; and

(b) was unable to accurately interpret the weather information which he received, or was unable to make appropriate judgments about the implications of those weather conditions for ongoing safety of flight.

The Captain's failure to divert the aircraft at 0932 when the weather at Norfolk indicated that the aerodrome would not be available for landing further reinforces this opinion.

The deficiencies in the Captain's flight planning process as it relates both to the weather information which he obtained and the amount of fuel that he took on board prior to departure, indicate that he may not have sufficient knowledge or appreciation of the flight planning requirements set out in the aviation legislation.

1.18.5.5 Possible Legislative Breaches

The pilot in command appears to have breached the following provisions of the CAR and the *Civil Aviation Act 1988* (CAA):

Section/Regulation	Offence Description
CAR 215(9)	Obligations of pilot in command to comply with the operations manual. The pilot failed to comply with the following parts of Pel-Air's operations manual: (e) Para 9.11.1(b) – fuel planning (f) Para 9.11.5 – calculation of last diversion time (g) Para 8.5.2.2(b) – last possible diversion point weather check (h) Para 1.2.8 – responsibility of pilot in command.
CAR 224	Obligation of pilot in command to ensure safety of flight, including safety of passengers and other crew on board the aircraft.
CAR 233 (1)(d)	Obligation of pilot in command to ensure that fuel supplies are sufficient for intended flight
CAR 234	Obligation of the pilot in command to take reasonable steps to ensure that the aircraft carries sufficient fuel and oil to enable the proposed flight to be conducted safely
CAR 239	Obligation of the pilot in command to make a careful study of all available information appropriate to the intended operation and to plan the flight accordingly
CAA 20A (1) and (2)	Operated an aircraft in a reckless manner that could endanger the life or property of another person.

1.19 Useful or effective investigating techniques

Nil

2.0 Analysis

2.1 The Captain

Opportunities were available to the Captain to adequately plan for the intended flight from Samoa to Norfolk Island. The evidence contained in the transcript of the conversation between the Captain and the Airservices briefing officer in Brisbane indicate that the flight planning was performed to an inadequate standard and weather and wind information necessary to properly gauge the fuel required for this flight was not obtained.

The Captain's view that by loading less fuel than on previous flights, he enhanced the aircraft climb performance enabling better accesses RVSM airspace meant that the aircraft did not carry sufficient fuel on board to deal with the worst case scenario of a depressurisation at the critical point on the planned route.

Analysis of information obtained during the investigation further suggests that the Captain either did not adequately monitor the status of the weather and the aircraft's fuel supplies during the flight or failed to recognise the significance of the deteriorating weather or its impact on making a successful landing at Norfolk Island. During the flight the Captain had opportunity to consider the deteriorating weather situation and make appropriate decisions in light of the deteriorating weather to safely divert to an alternative aerodrome.

The Captain was very likely influenced by his perception of the accuracy of the automatic weather station reported information from Norfolk Island. He appeared not to trust these reports and to second guess the formal information provided to him to him by the air traffic control centres in Fiji and Auckland New Zealand.

He appeared to be fixated on his goal of reaching Norfolk Island. The fact that he never obtained any weather information about suitable and available alternate aerodromes very likely indicates that the possibility of having to divert was never considered.

The decision to continue the flight to Norfolk Island ultimately placed the Captain in a position where he no longer had any other option but to make an emergency landing at sea in an otherwise airworthy aircraft due to the sole reason that the aircraft fuel supply was approaching exhaustion. This put his crew and passengers at serious risk of harm. The fact that all survived the ditching on the sea in the conditions prevailing at the time is fortuitous.

The manner in which the Captain planned and conducted the flight clearly suggests to CASA that he failed to give due regard to applicable aviation safety regulations and to instructions contained in the company Operations Manual.

CASA had formed the view that the Captain's performance in exercising privileges of his ATPL licence and Command Instrument Rating during the planning and conduct of the flight in question did not meet the standards required for the holder of such a licence.

2.2 The Company

The company operations manual was reviewed as part of the audit carried out coincident with the accident. Pertinent to the accident investigation, the Pel-Air Fuel policy ensured that the PIC was alerted to the need to consider alternate fuel requirements. The Pel-Air fuel policy required the pilot in command to calculate sufficient fuel for the flight and to include "alternate fuel to an alternate aerodrome, if required". This placed responsibility on the pilot in command to understand the requirements for alternates. There was specific guidance published in the operations manual to consider and calculate a Critical Point and Point of no Return and plan for a depressurisation scenario.

There is a responsibility on the company to ensure that pilots understood the requirements for alternates. For a Charter and Aerial work operation as varied as Pel-Air's the policy addressed the requirement to hold an alternate when conditions for an alternate existed. Conditions requiring an alternate are specified in Air Information Publication (AIP) and the Civil Aviation Orders. The audit confirmed the existence of the company policies but determined that these could be improved to give better guidance.

Analysis of the audit report resulted in CASA requiring a company prepared action plan to address the identified improvements. While the organisational failures raised serious concerns for CASA, the actions initiated by Pel-Air's Executive management following the accident of VH-NGA provided confidence to CASA that the Executive is committed to identifying and correcting those failures. The actions included the grounding of the Westwind fleet, re-training for all Westwind pilots and the initiation of a Management Action Plan to initiate a range of corrective actions to ensure that safe operations of the Westwind fleet.

2.3 Causal Factors

The investigation has concentrated on the operational aspects of this accident and the factors which came to light as the investigation progressed.

In analysing this investigation the active failures committed by the pilot and the operating company having an immediate impact upon the safety of the aviation system are:

Procedures not followed

Less than adequate planning

Inaccurate system diagnosis

Poor decision making

Lack of knowledge

Misperception of hazards.

Factors at the task or operating environment level are:

Procedures less than adequate.

The current Legislation is less than adequate for specifying remote island alternate fuel reserves when conducting air ambulance flights carrying passengers.

3.0 Conclusion

The investigation into the circumstances of this flight has revealed that the fuel planning which the Captain undertook in arriving at the figures of 3 hours 30 mins flight time and 7200 pounds required fuel was well below the standard required of an Airline Transport Pilot (Aeroplane) Licence (ATPL) holder.

The most significant defects in the flight planning were that:

The pilot did not receive an area forecast for the route he intended to fly (Samoa – Norfolk), nor did he source any information relating to the strength of the prevailing high level winds along the route. In the absence of this critical data, there was no sound basis for his estimated flight time of 3 hours 30 minutes, nor for his estimate of required fuel; and

It does not appear that he took into account contingencies such as the possibility of a depressurisation and/or an engine failure in calculating the amount of fuel which he took on board at Samoa.

He did not take into account the possibility of a forced diversion.

Having commenced the flight from Samoa to Norfolk Island, the transcript of the Captain's communications with Air Traffic Control (ATC) in Fiji revealed that he received a weather report for Norfolk Island at 0801 UTC which showed that the weather conditions at Norfolk Island had deteriorated from those forecast during his flight planning at Apia. Further communications with Auckland ATC revealed that he received a weather forecast for Norfolk Airport at 0904 UTC which showed that the weather conditions at Norfolk Island were deteriorating and were below the minimum criteria at which an alternate aerodrome is required. This information meant that the weather was unlikely to remain suitable for a safe landing at Norfolk Island and the Captain should have diverted the aircraft to Noumea. A further weather report received by the Captain at 0934 UTC indicated that Norfolk Airport was no longer suitable as a destination.

When the Captain received the weather forecast at 0904 UTC, he was approximately 1 hour from Norfolk Island and in a position where it would have still have been a viable option for him to have diverted the aircraft to Noumea . The fact that he elected to pursue a landing at Norfolk Island in light of the weather forecast which he received at 0904 UTC indicates that he may not have the necessary aeronautical skill and knowledge to make appropriate command judgements about the likely effect of weather.

3.1 Findings

The aircrew were properly licensed.

The aircraft was issued with a valid Certificate of Airworthiness.

The aircraft had been subject to regular maintenance.

The aircrafts fuel supply was nearly exhausted.

The pilot in command carried out a successful ditching in the sea.

All on board survived and were rescued.

The pilot in command's decision making skills were less than adequate.

The operator's procedures did not fully describe the operation.

The pilot in command did not follow published procedures.

The legislation in relation to fuel for flights to remote island carrying passengers is less than adequate in the category of aerial work.

4.0 Safety Actions

4.1 Suspension of Licence and Ratings

In accordance with CAR 265(1), CASA suspended the Captain's Commercial Pilot (Aeroplane) Licence, Airline Transport Pilot (Aeroplane) Licence and Command (Multi-Engine Aeroplane) Instrument Rating and he has been required to undergo an examination under CAR 5.38. CASA has suspended the Captain's licences and rating because the matters raised in this accident report indicate he may not have the aeronautical skills and knowledge appropriate to the licences and rating. This suspension was affected immediately and shall cease if and when CASA terminates the suspension in writing.

Further actions other than those listed above may be taken.

4.2 Theory subjects to be re-examined

Required to pass the following ATPL theory subjects:

(a) Flight Planning - Aeroplanes AFPA

(b) Performance and Loading - Aeroplane APLA

(c) Meteorology - Aeroplane and Helicopter AMET

(d) Human Factors - Aeroplane and Helicopter AHUF

(e) Air Law - Aeroplane and Helicopter AALW

(f) IREX Theory IREX

The examination of the theory subjects is to be conducted through Assessment Services Pty Ltd (ASL). All examinations are to be conducted at the ASL facility at Bankstown unless otherwise agreed to by CASA.

4.3 Flight Test

A Commercial Pilot Licence (CPL) flight test is to be conducted in an aircraft type and at a place and time to be mutually agreed upon but not prior to completion of the theory examinations. The CPL flight test will be conducted according to the requirements specified on the Commercial Pilot Licence Form 090 and will also include an en-route assessment for Critical Point/Point of No Return and the decision to apply a diversion to an alternate, focusing on weather with a minimum fuel scenario.

A Command Instrument Rating (CIR) flight test is to be conducted in a twin engine aircraft of a type and at a place and time mutually agreed upon but not prior to completion of the theory examinations. The CIR flight test will be conducted according to the requirements specified on the Instrument Rating Application Form 645. The test will assess performance against all navigation aids identified on the test form being, NDB, VOR, ILS, DME/GPS arrival and GNSS/RNAV with associated sector entry and holding patterns. The test is to include en-route assessment for Critical Point/ Point of No Return and the decision to apply a diversion to an alternate, focusing on weather with a minimum fuel scenario.

The CPL and CIR flight tests may be undertaken separately or the applicant may elect for CASA to combine the elements of the assessments into a single flight test. The aircraft that will be mutually agreed upon should be sophisticated enough to permit an assessment for the ATPL/CPL licence to be un-suspended and the pilot is to supply the aircraft.

4.4 Proposed legislative amendment

The CASA Standards Development Branch has commenced a project (OS 9/13) to review regulations and guidance concerning fuel planning and alternate aerodrome considerations. This project is being conducted in two phases.

Phase 1 involves reviewing the requirements for operations to remote islands. It is proposed to require fuel for flight to an alternate aerodrome (from the destination aerodromes) for passenger-carrying commercial flights to a remote island, regardless of the meteorological conditions. This will involve amendments to section 82.0 of the Civil Aviation Orders (CAO) and also the addition of guidance in Civil Aviation Advisory Publication (CAAP) 234-1. The CAAP will also be enhanced by providing guidance on considerations necessary for flights to any remote aerodrome and in particular, when and under what circumstances a pilot should consider a diversion.

Phase 2 will involve a more comprehensive review of CAAP 234-1, with an emphasis on in-flight fuel management. Regulatory changes are also being considered to further strengthen the requirements for in-flight fuel management, including a requirement that a pilot must not continue a flight to its intended destination if a safe landing can not be performed (with fuel reserves remaining intact), when an alternate aerodrome is available.

4.5 Company Actions

The operator formulated an action plan to address the deficient procedural elements of the operations manual which was acceptable to CASA. These are documented in the special purpose audit report carried out coincident with the accident, reference EF09/25167

Authorised by

Richard White

Manager Accident Liaison and Investigation Unit

21 July 2010