

Removal of information for Final Report from Draft 1 and Draft 2

What the ATSB found

Removed from Draft 2 “The requirement to ditch resulted from the flight crew’s incomplete pre-flight and en route planning and their not assessing before it was too late to divert that a safe landing could not be assured. The flight crew’s in-flight management of the worsening and previously unforecast weather at Norfolk Island influenced their decision to continue to the island, rather than divert to a suitable alternate.

Clearer guidance on the in-flight management by crews of previously unforecast, but deteriorating destination weather may have influenced the crew to consider their diversion options earlier, allowing more time for the necessary planning. However, the operator’s limited oversight of its aeromedical operation increased the risk that crews would develop their own pre- and in-flight management methods, diminishing the reliability of its own risk controls in such operations. The occupants’ exit from the immersed aircraft was facilitated by their prior wet drill and helicopter underwater escape training. Their location by rescuers might, in other circumstances not have been so positive.”

Public Final “The requirement to ditch resulted from incomplete pre-flight and en route planning and the flight crew not assessing before it was too late to divert that a safe landing could not be assured. The crew’s assessment of their fuel situation, the worsening weather at Norfolk Island and the achievability of alternate destinations led to their decision to continue, rather than divert to a suitable alternate.

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

The occupants’ exit from the immersed aircraft was facilitated by their prior wet drill and helicopter underwater escape training. Their subsequent rescue was made difficult by lack of information about the ditching location and there was a substantial risk that it might not have had a positive outcome.

Personnel information

Pilot in command

Removed from Draft 1 “There was no evidence in the operator’s training file for the PIC to suggest the completion of that additional training during his post-endorsement training.

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

Removed from Draft 1 “The balance of evidence does not support the potential for the crew’s performance to have been significantly affected by fatigue.

Draft 2 “The flight crew had a less than ideal rest period in the morning prior to the flight, and they were probably experiencing fatigue at a level that has at least some effect on performance. However, there was insufficient evidence available to determine the level of fatigue, or the extent to which it may have contributed to the crew not comprehending the significance of the 0800 SPECI.

Public Final.

The flight crew had been awake for over 12 hours before being called on duty at 0900 for the departure from Sydney on the previous day, and they had been awake for over 22 hours when they landed at Samoa. After having breakfast they had about 8 hours opportunity at a hotel for rest prior to returning to the airport. The captain initially reported to the ATSB that he slept for most of this period and was well rested, but later reported to the Civil Aviation Safety Authority (CASA) that he had only about 4 hours sleep but did not feel fatigued. The first officer advised of having 5 to 6 hours sleep and feeling well rested.

Based on this information, it is likely that the flight crew were experiencing a significant level of fatigue on the flight to Samoa, and if the captain only had 4 hours sleep then it is likely he was experiencing fatigue on the return flight at a level likely to have had at least some effect on performance. However, there was insufficient evidence available to determine the level of fatigue, or the extent to which it may have contributed **to him** not comprehending the significance of the 0800 SPECI. “

Fuel requirements

Removed from Draft 1

“Paragraph 3A.1 of the CAO required ‘minimum safe fuel’ as defined above must be carried for passenger-carrying charter operations. The accident flight was not that category of operation, so the requirements of paragraph 2.4 did not have effect in this case.

Operations manual

From Draft 2 “The carriage of full fuel in this case would have enabled the aircraft to land safely in the event of a cabin depressurisation from the least favourable location during the flight subject to the pilot becoming visual from an instrument approach at Norfolk Island.

Flight Planning

From Draft 2 “Flight crews were expected to use their own methods, systems and tools for pre-flight planning. It was reported that copilots modified their techniques to reflect the preferred methods for each PIC with whom they flew.

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

(yes there was independent evidence, there was the RCAs issued by CASA against this in the special audit)

Additional Information

From Draft 1 “The PIC stated that he planned his fuel requirements based on the figures taken from the OM.

Changed to in Public Final “The PIC stated that he planned his fuel requirements based on the method in the operations manual, which was found to give a similar result to that using the AFM fuel consumption figures.

Public Final “There was no independent evidence to confirm that the operator routinely assessed pilots’ processes for calculating/updating PNRs en route and their application of that revised data to their alternate decision making. This was consistent with the requirements of the operations manual, which did not require all elements of a proficiency check to be recorded as having been carried out.

Aeromedical organisation consideration of operator risk

From Draft 2 “The Basic Aviation Risk Standard (BARS) was developed by the Flight Safety Foundation of Australia in response to a resource industry-identified need for a safety audit standard for application to on-shore resource sector aviation support activities (see <http://flightsafety.org/bars>). Undertaken separately to any audit or surveillance by CASA, BARS provides an example of how contracting companies might assure themselves of a requisite level of safety assurance necessary for their operations.

BARS applies a risk-based model against the actual threats to resource industry aviation operations. Associated controls and recovery and mitigation measures are considered in response. The aeromedical retrieval company that was involved in this accident last undertook its own safety audit of the operator in 2002. It may be that aeromedical or other contractors of aviation services might find that BARS or other similar aviation audit and/or risk tools have relevance to the consideration of their own aviation-related risk exposure.

Public Final “The aeromedical retrieval company that was involved in this accident last undertook its own safety audit of the operator in 2002. There was no standing requirement for the company to undertake such audits

Added to Final not previously in any Drafts:

Operational guidance and oversight

Public Final “The accident flight demonstrated that variable weather conditions, if not managed effectively, were a risk factor in aeromedical operations to remote island destinations. For passenger-carrying charter operations, that risk was addressed by a regulatory requirement in Civil Aviation Order 82.0 that sufficient fuel shall be carried to reach the destination and then divert to an alternate aerodrome. The accident flight was, however, classified as aerial work and so those provisions did not apply. Instead, the requirement was that, in specific forecast or current weather conditions, sufficient fuel should be carried to reach an alternate aerodrome. Otherwise, including in the case of the accident flight, fuel planning did not need to consider alternate destinations.

The operator's procedures complied with the relevant regulatory guidance. Part A of those procedures set out requirements for fuel planning. Methods for calculating fuel consumption to support that planning were set out in Part B. It was possible to understand the fuel calculations in Part B as being a method of fuel planning. No detailed and consistent methodology for carrying out flight planning was available, which would explain flight crews applying their own individual methodologies and reports of copilots varying their techniques to suit respective pilots in command (PIC).

Although the PIC complied with a Westwind-specific fuel planning method in Part B of the operations manual, his flight planning method did not ensure compliance with all of the fuel policy requirements in Part A of that manual. Part A required pilots to account in their fuel planning for the possibility of abnormal operations.

Operational oversight relies *inter alia* on procedures that ensure compliance with an operator's procedures. In this instance, there was significant variation in pre-flight planning procedures by flight crews that would have made it more difficult for the operator to oversee the consistent conduct of flights. Although not required by the operator's procedures, closer review of flight documentation and how it was being applied would have increased the likelihood that inconsistent interpretation and application Parts A and B of the operations manual concerning fuel management would have been identified.

(they got pinged for this re fuel policy, see the CASA special audit)

Flight plan preparation and submission

Removed from Draft 1 "Despite the potential for frustration associated with those difficulties, and the potentially increased workload and stress as a result, a number of alternate flight plan submission options such as facsimile and by telephone were available, and the condition of the **patient ought not to have influenced the thoroughness of the flight planning by the crew**. Pilots are often compelled to manage such pre-departure difficulties and it was concluded that the potential for the difficulty accessing the internet and contacting the operator to have explained any incomplete or inaccurate flight planning was minimal.

Added in the Final " Despite the likely increased workload and stress as a result the difficulties experienced in preparing and submitting the flight plan, a number of alternate flight plan submission options were available. It was concluded that the potential for the difficulty accessing the internet and contacting the operator to have explained any incomplete or inaccurate flight planning, or problems with its submission, was minimal.

Added to the Final "The development of the flight plan by the PIC without input from the copilot was in accordance with standard operating procedures. This meant that the flight plan was developed by one person and not reviewed by the copilot for accuracy and compliance with requirements, which reduced the likelihood that any flight planning omissions or errors would be identified

Removed from Draft 2 "However, the operator's expectation that pilots would use their own methods, systems and tools for pre-flight planning had the potential to dilute those regulatory and procedural requirements as risk controls. To some extent, this might explain the pilot in command's (PIC) actions to develop the flight plan for the flight to Norfolk Island by reversing his outbound flight

plan to Apia and applying the previously-experienced upper winds and NOTAMs to his planning for the return flight via Norfolk Island.

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

(and not replaced with anything in Public Final)

Preflight Planning

Removed from Draft 1 “Despite the initially unforecast weather at Norfolk Island, a number of regulatory and operator risk controls were in place to address that hazard. In the first instance, more accurate fuel planning would have been expected had the flight crew sought an en route forecast that predicted the wind at the intended cruising level. In the event, given the forecast in-flight weather, aircraft performance and regulatory requirements, the flight crew departed Apia with less fuel than required to safely complete the flight in case of one engine inoperative or depressurised operations.

Replaced with :

Implications for the Flight

A number of regulatory and operator risk controls were in place to address the risk of previously unforecast but deteriorating weather at Norfolk Island. In the first instance, more complete fuel planning would have been possible had an en route forecast been sought that predicted the wind at the intended cruising level. Knowledge of these winds was also necessary for the PIC to comply with the operator's requirement for the calculation during flight planning of the CP and PNR, and to take account of the risk of the aircraft sustaining an engine failure or in-flight depressurisation. It might also be expected that acting to obtain the upper winds might also have influenced the PIC to seek other perhaps relevant en route and aerodrome forecasts, NOTAMs and other information.

Seeking and applying appropriate en route weather updates

Removed from Draft 1 “The pilot in command would have been aware of his responsibility for the safety of the flight, for which both crew members were qualified. The pilot's ATPL(A) qualification should have ensured his understanding of the importance, calculation and application of the regulatory and operator requirements in terms of CPs, PNRs/latest divert time/point to the flight.

The general nature of the regulatory guidance for seeking and then applying amended en route weather and other information and planning updates to in-flight operational decisions was expected to be supplemented by operator guidance to their crews for safe operations. In turn, the reliance on regulatory and operator requirements as risk controls in such circumstances was predicated on flight crew compliance with those requirements and procedures.

Replaced with in Public Final “The PIC would have been aware of his responsibility for the safety of the flight, for which both crew members were qualified. This included the need for in-flight weather-related decisions that were based on the most recent weather and other relevant information. The PIC's Airline Transport Pilot (Aeroplane) Licence (ATPL(A)) qualification assessed his ability to calculate and apply the regulatory and operator requirements in terms of CPs and PNRs. **However,**

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

En route management of the flight

Added to Public Final “However, there were no regulated requirements or operator procedures to inform the crew of when to obtain the most recent weather information in order to manage an unforecast deterioration in the weather. This increased the risk of crews inadvertently continuing to an unsafe destination.

Contributing safety factors

Removed from Draft 1 • The flight crew did not plan the flight in accordance with the existing regulatory and operator requirements, precluding a full understanding and management of the potential hazards affecting the flight.

Replaced with Public Final “• The pilot in command did not plan the flight in accordance with the existing regulatory and operator requirements, precluding a full understanding and management of the potential hazards affecting the flight.

Other safety factors

Removed from Draft 2 • The operator's limited oversight of the aeromedical operation and flight planning guidance prevented a full understanding by the operator of the residual risk affecting the operation. *[Minor safety issue]*

Added to Public Final

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

Operator oversight of the flight and its planning

Removed from Draft 2

Minor safety issue

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

Action taken by CASA

Following the accident, CASA carried out a special audit⁸ of the operator's operations in Sydney, Adelaide and Nowra between 26 November and 15 December 2009. The audit included an extensive

assessment of the operator's Westwind operations and a number of the operator's organisational aspects.

A number of deficiencies in the operator's Westwind operations were identified, which were communicated to the operator on 7 December 2009.

Replaced with in Public Final

Minor safety issue

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

Action taken by aircraft operator

Following the accident, CASA carried out a special audit⁵⁹ of the operator's operations in Sydney, Adelaide and Nowra between 26 November and 15 December 2009. The audit included an extensive assessment of the operator's Westwind operations and a number of the operator's organisational aspects.

Removed from Draft 2

- Formal training for international operations was implemented.
- A refresher training course for Westwind pilots was implemented, covering:
 - Compliance, company structure, standard operating procedures, fuel calculations, flight planning and company human resources policies.
 - Knowledge of Westwind and CAO 20.7.1.B performance requirements, and the calculation of take-off data and CAO 100.7 weight and balance calculations.
 - Human factors, incorporating crew resource management and threat and error management skills (this course will take place biennially).
 - Revalidate all crew on the principles of Global Positioning System equipment for en-route navigation.
 - Safety Management System (SMS) training and in the Company Safety Policy.
 - Ensure crew have a complete understanding of the FAID[®] system as part of the company's fatigue risk management system and to ensure pilots understand and are proficient in completing the fatigue aspects of the operator's SMS reporting system.
 - Knowledge of aircraft systems.
 - Instrument flight rules and procedures.
 - Defect reporting requirements and the use of the aircraft maintenance log.

- Point of no return training, and training in the use of the 'Howgozit' graph for monitoring fuel use during long flights.
- The amended Westwind fuel policy.

The plan was initially supported by detailed pilot operations notice P47/09, which laid out the new operating requirements for Westwind operations. The general requirements were later transferred into the operations manual and supported by a shorter pilot operations notice, P 38/10, which provided Westwind-specific nominal fuel planning figures.

The operator is planning a review of the above changes, in consultation with the initial change agents, to assess the relevance of the implemented changes as an effective risk mitigation. Any subsequent change to the operator's processes will be controlled through the review process.

Replaced with in Public Final • A refresher training course for Westwind pilots was implemented that covered required knowledge for Westwind operations.

Removed from Draft 2

ATSB assessment of the operator's action

The ATSB is satisfied that the action taken by the operator adequately addresses the safety issue.