



Australian Government
Australian Transport Safety Bureau

26 February 2010

Accident Investigation Liaison Unit
Civil Aviation Safety Authority
GPO Box 2005
Canberra ACT 2601

Dear

**AO-2009-072 – Ditching – 3 NM south-west of Norfolk Island Aerodrome –
18 November 2010 – Westwind, registered VH-NGA - Critical Safety issue**

I refer to the meeting between officers of the Civil Aviation Safety Authority (CASA) and Australian Transport Safety Bureau (ATSB) that took place by video conference on 3 February 2010, and agreed that a critical safety issue existed in respect of the lack of regulation or guidance for pilots when exposed to previously unforecast meteorological conditions on long flights to destinations with no nearby alternates. An outcome of that meeting was that a number of the CASA participants indicated that they understood the issue, and that it should be progressed with CASA management.

Subsequently, on 12 February 2010, you rang the investigator in charge of the ATSB safety investigation, and requested a supporting letter that described the critical safety issue and requested CASA's assistance in its resolution. In later telephone calls to me, you suggested that the receipt of this letter would allow you to 'kick-start' CASA's consideration of, and response to the issue.

62 Northbourne Avenue, Canberra City ACT 2601
Telephone: 02 6274 6443
24 hours: 1800 020 616

PO Box 967, Civic Square ACT 2608 Australia
Facsimile: 02 6247 3117
www.atsb.gov.au

ABN 65 061 156 887

UNCLASSIFIED COVERING INVESTIGATION -
IN - CONFIDENCE

Attachment One describes the nature of the critical safety issue that was identified as a result of the ATSB's initial investigative work in respect of the above accident, and formed the basis of our discussions on 3 February 2010. CASA's commitment to address the safety issue is appreciated.

Please don't hesitate to contact me on telephone
should you have any questions or comments.

Director Aviation Safety Investigations
Australian Transport Safety Bureau

Attachment:

1. Nature of the critical safety issue – ditching 3 NM south-west of Norfolk Island Aerodrome, 18 November 2010

Nature of the critical safety issue – ditching 3 NM south-west of Norfolk Island Aerodrome, 18 November 2010

Background

Central to the investigation by the Australian Transport Safety Bureau (ATSB) of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

A safety issue is a safety factor that:

- can reasonably be regarded as having the potential to adversely affect the safety of future operations, and
- is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operational environment at a specific point in time.

The ATSB's assessment of the risk level associated with an identified safety issue reflects the risk level as it existed at the time of the occurrence. That risk level may subsequently have been reduced as a result of safety actions taken by individuals or organisations during the course of an investigation.

Safety issues are broadly classified in terms of their level of risk. A critical safety issue is associated with an intolerable level of risk, and generally leads to the immediate issue of a safety recommendation unless corrective safety action has already been taken.

Safety action includes the steps taken or proposed to be taken by a person, organisation or agency in response to a safety issue. The ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

Introduction

On 18 November 2009, an Israel Aircraft Industries Westwind 1124A aircraft, registered VH-NGA, ditched in the ocean 3 NM (6 km) to the south-west of Norfolk Island. The six occupants evacuated the sinking aircraft and were later recovered by a rescue vessel from Norfolk Island.

The flight crew had been unable to conduct a landing at Norfolk Island Airport because they could not see the runway after conducting four instrument approaches. The crew then elected to ditch before the aircraft's fuel supply was exhausted.

Based on an early assessment of the safety risk identified in the initial data gathering phase of the ATSB safety investigation, the following critical safety issue was identified:

Safety issue

There were no regulations or other guidance for application by flight crews when making in-flight, weather-related decisions in a changing meteorological environment. That reduced the reliability of in-flight decision making, and increased the risk of an aircraft arriving at a destination with insufficient fuel to continue to an alternate aerodrome, if the weather at the intended destination has deteriorated below its landing minima.

Initial safety action by the ATSB

In accordance with its preference to encourage relevant organisation(s) to initiate proactive safety action to address any identified safety issues, and in recognition of the criticality of the above safety issue, a meeting was convened by the ATSB with Civil Aviation Safety Authority (CASA) officers on 3 February 2010 to highlight the identified issue. In addition, the ATSB sought an understanding of the potential for safety action by CASA.

Initial safety action by CASA

During the 3 February 2010 meeting, CASA officers indicated that they understood the issue, and that it should be progressed with CASA management.

Development of the critical safety issue

Existing regulations and other guidance

An examination of the extant regulations and other guidance has identified that a pilot's pre-flight fuel planning shall, in addition to other considerations, take into account the forecast meteorological conditions for the destination and, if necessary, the alternate aerodrome. As a result, the affected pilot can uplift the appropriate fuel and otherwise plan his or her flight.

At the time of the accident, there were no regulations or other guidance to inform pilots' decision making once a flight had commenced and that would maximise the probability of a safe landing. This can be particularly pertinent to a flight undertaken in the following circumstances:

- the flight is of longer duration (at least several hours)
- there are few suitable alternates
- the available planning forecast indicates good terminal weather conditions for the arrival at the destination.

The flight planning regulations that were in place at the time of the accident required the carriage of sufficient fuel for the flight to the destination plus appropriate reserves; but, dependent of the forecast weather conditions and other factors affecting an aircraft's arrival, the relevant aircraft was not required to carry sufficient fuel to continue to an alternate. In addition, the affected aircraft may not have needed to have nominated an alternate at all. In consequence:

- There can be a point in such a flight at which the options for a safe landing reduce to one. From that point, the safety of the flight can only be assured if the destination weather remains adequate to assure a safe landing.
- The carriage of less fuel means less range. In that case, there are fewer options for the relevant flight crew to manage changing circumstances that may develop during their flight.
- If the forecast at the intended destination at the estimated time of arrival (ETA) does not require the nomination of an alternate, there is less incentive for a flight crew to be mindful once en route of the availability of potential alternate landing sites. Once passed and out of range, those landing sites would no longer represent suitable alternates.

The risk associated with a flight under the existing regulations and available guidance material can only be assured if the destination weather remains as forecast, or a suitable alternate is within the aircraft's range.

It could be argued that the most critical point during a flight to assess a destination's forecast weather conditions is the position from which the options for an assured safe landing have reduced to one. It would appear that many flight crew devote the necessary attention to their destination's weather conditions at the time of flight planning, but that the criticality of their in-flight decision making in respect of that (now possibly updated) weather is perhaps not recognised.

Examination of the existing regulations and guidance

An examination of the regulations and other guidance that applied to the accident flight suggested that there was little, if any operational information that could be expected to assist a pilot's in-flight decision making in respect of destination weather and the continuation or otherwise of a flight. The operational information that was examined included:

- civil aviation regulatory documents, including: Acts, Regulations and Orders; Civil Aviation Advisory Publications; and the Aeronautical Information Publication Australia (AIP)
- the theory-based knowledge and practical application for flight crew licence holders

- long distance operators' fuel requirements as specified in the large majority of those operators' operations manuals.

The results of that examination are summarised in the following paragraphs.

Fuel planning requirements. The practical regulatory requirements affecting fuel planning in the face of adverse destination weather conditions are at AIP ENR 73 *Alternate Aerodromes*, paragraphs 73.1 and 73.2. In addition, AIP ENR 1.10 *Flight Planning*, paragraph 1.2.5 discusses the validity requirements affecting the destination and (if required) alternate aerodrome forecasts, and the requirement for the nomination of those aerodromes in the flight plan. ENR 1.10 paragraph 1.2.6 requires the update of meteorological and operational information should a flight be delayed by more than 1 hour. All of which explicitly refer to the application of meteorological forecasts to flight planning. There is no guidance to suggest pilots should update their initial planning to 'make provision for flight to an alternate aerodrome' or to 'provide for a suitable alternate aerodrome' in response to en route weather or other updates.

Relevant rating and licence syllabi. As a part of this investigation, the ATSB examined the respective theory syllabi for a Command Instrument Rating and for the Day VFR syllabus (covering the theory requirements for the Private Pilot and Commercial Pilot (Aeroplane) Licences). In addition, the owner of a large Airline Transport Pilot (Aeroplane) Licence (ATPL(A)) school was interviewed, as an expert on the required knowledge for an ATPL(A) licence. All of the evidence indicated that, while a pilot should know how to find or to calculate the necessary information in support of a decision to continue a flight, pilots are not being taught how and when to request the necessary in-flight information to undertake or update those calculations. In addition, once a pilot has made those calculations, it appears that they have not been taught how to use the results of the calculations to make the most appropriate decision to ensure safe flight.

Long distance operators' en route fuel planning requirements. An examination was carried out of a number of long distance turbine operators' en route fuel planning requirements for application by their crews in circumstances such as described above (in terms of the duration of a flight, the availability of alternates and the weather at the planned destination). In most cases, the respective operations manuals required flight crews to 'monitor' the destination weather, and to 'consider' the need to divert. Of those operators examined, two used a prescriptive 'decision to continue' method in flights of this type. One of those was Pel-Air, which recently incorporated this requirement following consultation with CASA staff.

In-flight application of the existing regulations and guidance

The ATSB has identified an inconsistent approach by pilots to the en route management and application of destination weather. Responses from operators and flight crew indicate that flight crew are expected to use ‘good airmanship’, ‘common sense’, or ‘conservative decision making’ when making in-flight decisions to divert. These are tacit, experience-driven methods of managing in-flight decision making. The subjective nature of that methodology decreases the reliability of the decisions, increasing risk. The investigation has established a number of examples of that unreliability, including:

- **When flight crews seek weather updates.** Some crew indicated that they obtained regular updates of their destination’s weather, and some used operationally-driven triggers. That included when approaching a critical operational point, such as the last point of safe diversion.
- **Weather products sought by flight crews.** Some flight crews stated that, when en route, they requested destination aerodrome weather reports, and correlated them with the pre-flight aerodrome forecasts (TAF) to satisfy themselves that the pre-take off destination forecast was still correct. Some flight crews preferred to check if the destination’s TAF had been amended.
- **Weather product reliance - in-flight decisions.** Some flight crews indicated that they based their in-flight decision to continue or to divert on the destination TAF; some based their decision on developing trends in the destination weather reports; and others used forecasts when more distant from their destination, and changed to relying on weather reports as they got nearer to their destination.
- **Relevance of the landing and alternate minima to the decision to divert.** Some flight crews reported that they diverted if the destination weather information (be it derived from the TAF or destination weather reports) was below the destination aerodrome’s alternate minima. Alternately, some crews stated that they only diverted if the weather information approached or was below the destination aerodrome’s landing minima.