



The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory Agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in:

- independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis and research
- fostering safety awareness, knowledge and action.

The ATSB does not investigate for the purpose of apportioning blame or to provide a means for determining liability.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements.

When the ATSB issues a safety recommendation, the person, organisation or agency must provide a written response within 90 days. That response must indicate whether the person, organisation or agency accepts the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

© Commonwealth of Australia 2010

This work is copyright. In the interests of enhancing the value of the information contained in this publication you may copy, download, display, print, reproduce and distribute this material in unaltered form (retaining this notice). However, copyright in the material obtained from non-Commonwealth agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Subject to the provisions of the *Copyright Act 1968*, you must not make any other use of the material in this publication unless you have the permission of the Australian Transport Safety Bureau.

Please direct requests for further information or authorisation to:

Commonwealth Copyright
Administration, Copyright Law Branch
Attorney-General's Department
Robert Garran Offices
National Circuit
BARTON ACT 2600

www.ag.gov.au/cca

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608
Australia
1800 020 616
+61 2 6257 4150 from overseas

Jan10/ATSB49

Released in accordance with section
25 of the *Transport Safety
Investigation Act 2003*

Ditching – Norfolk Island – 18 November 2009

Abstract

On 18 November 2009, an Israel Aircraft Industries Westwind 1124A aircraft, registered VH-NGA, ditched in the ocean 3 NM (6 km) to the 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.

Following the event, the aircraft operator initiated a program of checking and revalidation for the company's commercial Westwind pilots.

The investigation is continuing.

FACTUAL INFORMATION

The information contained in this preliminary report is derived from initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may become available that alters the circumstances as depicted in the report.

History of the flight

At about 0545 Coordinated Universal Time¹ on 18 November 2009, an Israel Aircraft Industries Westwind 1124A aircraft, registered VH-NGA, departed from Apia, Samoa, under the instrument flight rules, on an aeromedical flight to Melbourne, Vic. A refuelling stop was planned at Norfolk

Island. The flight was initially planned to take off at 0530 but was delayed. There were six people on board the aircraft, comprising two flight crew, two medical staff, a patient and the patient's partner.

At Apia, the pilot in command submitted a flight plan by telephone to Airservices Australia. At that time, the forecast weather conditions at Norfolk Island for the arrival did not require the carriage of additional fuel for holding, or the nomination of an alternate airport. The crew elected to only fill the aircraft's main tanks, which would provide sufficient fuel and reserves for the flight. There was no fuel in the aircraft's wing tip tanks.

The flight crew stated that, on reaching the planned cruising altitude, the headwind gradually increased and, in response, the engine thrust settings were reduced to increase the aircraft's range.

During the flight, meteorological information was received from Auckland Oceanic² that indicated the weather at the island was deteriorating. The flight crew reported that they also monitored the weather reports for Norfolk Island during the flight and, at 0904, they requested the 0900 Norfolk Island automatic weather report³.

The crew subsequently received an updated weather report that was issued at 0902. The report indicated that the weather conditions had

1 The 24-hour clock is used in this report to describe the time of day, Coordinated Universal Time (UTC), as particular events occurred.

2 The air navigation service provider for that portion of the flight.

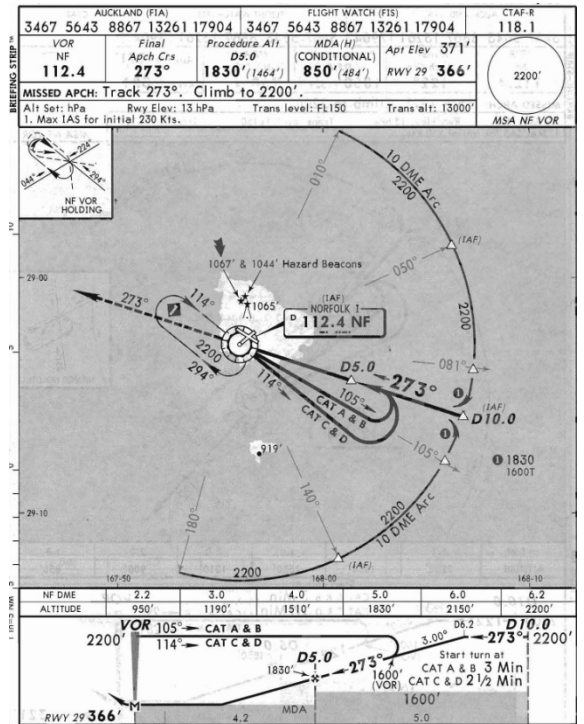
3 A weather **report** is a report of observations of meteorological conditions at an aerodrome. A report refers to a time in the past. A weather **forecast** is a statement of expected meteorological conditions for a specified period, and for a specified area or portion of airspace. A forecast refers to a time in the future.

deteriorated from those forecast at the time of the flight's departure from Apia.

At 0928, the flight crew contacted the Norfolk Island Unicom⁴ operator (Norfolk Unicom), advising that they were about 20 minutes from the airport. Norfolk Unicom provided an updated weather report, indicating a deterioration in the conditions to well below the landing minima⁵. Subsequently, the crew sought regular weather updates from Norfolk Unicom as they descended, and also requested the operator to proceed to each end of the runway to assess the weather conditions in order to supplement the official weather report.

Upon arrival at Norfolk Island, the copilot conducted a very high frequency omnidirectional radio range/distance measuring equipment (VOR/DME) instrument approach procedure⁶ for a landing on runway 29 (Figure 1). However, the flight crew was not 'visual' at the missed approach point,^{7,8} and a missed approach was carried out at 1004. At that time, it was dark and raining with low cloud and poor visibility.

Figure 1: Runway 29 VOR/DME instrument approach procedure

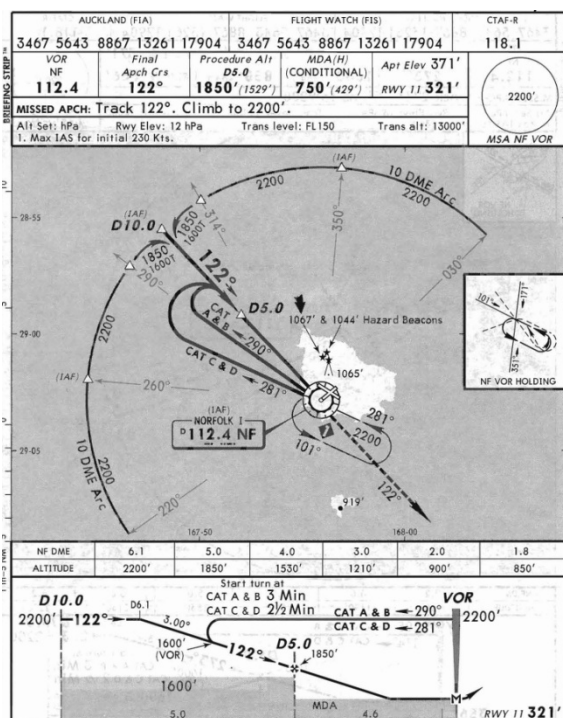


Following the missed approach, the pilot in command assumed control of the aircraft as the handling pilot. A second instrument approach was conducted for runway 29; however, the crew were again unable to visually acquire the runway, and initiated a second missed approach at about 1013.

The flight crew then repositioned to conduct a VOR/DME instrument approach for landing on runway 11. The runway 11 instrument approach procedure permitted the crew to descend 100 ft lower than the runway 29 approach before acquiring visual reference with the runway (Figure 2).

- 4 'Unicom' is a local non-Air Traffic Services communications service that provides additional information to pilots at a non-towered aerodrome.
- 5 The prescribed minimum meteorological conditions under which an aircraft can land from the lowest altitude of an instrument approach procedure.
- 6 An instrument approach procedure is a set of predetermined manoeuvres conducted by reference to flight instruments that are used to fly an aircraft to a point, known as a missed approach point. From this point, a landing can be completed if the pilot can see the runway. Alternately, a missed approach can be commenced in order to climb the aircraft to a safe height.
- 7 In the case of a VOR/DME approach, the requirement for a pilot to execute a missed approach included not establishing visual reference at or before the missed approach point for the approach. Visual reference meant that either; the runway threshold, the runway approach lights (if installed), or other markings identifiable with the landing runway were clearly visible to the pilot.
- 8 A point on an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated by the pilot to ensure the maintenance of the required minimum obstacle clearance.

Figure 2: Runway 11 VOR/DME instrument approach procedure



The crew did not gain visual reference with runway 11 and conducted a third missed approach at about 1019, before reporting to Norfolk Unicom that they were planning to ditch because the aircraft was running out of fuel. The crew then conducted a third instrument approach for runway 29 (four approaches in total), but again did not visually acquire the runway.

The fourth missed approach procedure was initiated at about 1025. The crew then levelled the aircraft at about 1,200 ft above mean sea level and turned the aircraft to the south-west. When the flight crew were confident that they were established over water they; reduced engine thrust to flight idle, selected full flap extension with the landing gear retracted, and adjusted the aircraft's attitude on instruments to slow the aircraft to an approach speed of 100 kts. The aircraft's landing lights were switched on, however, the flight crew later reported that they never saw the surface of the sea before ditching.

The pilot in command reported maintaining control of the aircraft during the descent by reference to the attitude indicator, and initiating a normal landing flare by reference to the radio altimeter. The pilot stated that contact with the water was at 100 kts. All of the occupants survived the ditching. The aircraft sank about

3 NM (6 km) west of Norfolk Island. Ninety minutes later the occupants were rescued by a vessel from Norfolk Island.

A radio transmission that was recorded on Norfolk Unicom was consistent with a ditching at 1026:02. The last confirmed transmission on the Unicom by the flight crew indicated that the aircraft had been conducting a runway 11 instrument approach.

Personnel information

Pilot in command

| | |
|---------------------|---|
| Flight Crew Licence | Air Transport Pilot (Aeroplane) Licence issued 11 October 2002 |
| Instrument rating | Command instrument rating, valid to 28 February 2010 |
| Aviation medical | Class 1 medical, valid to 23 January 2010; vision correction required |

Wet drill emergency training Conducted 27 April 2008

Aircraft endorsement Command Westwind, issued 27 July 2007

72-hour history On reserve until about 0900 on 17 November 2009

Copilot

| | |
|---------------------|---|
| Flight Crew Licence | Commercial Pilot (Aeroplane) Licence issued 07 September 2004 |
| Instrument rating | Command instrument rating, valid to 31 October 2010 |

Aviation medical Class 1 medical, valid to 08 April 2010; vision correction required

Wet drill emergency training Conducted 19 April 2008

Aircraft endorsement Command Westwind, issued 29 January 2008

72-hour history On reserve until about 0900 on 17 November 2009

Aircraft information

| | |
|---------------------------------------|---|
| Type/model | Israel Aircraft Industries Westwind 1124A |
| Registration | VH-NGA |
| Serial number | 387 |
| Date of manufacture | 1983 |
| Date first registered in Australia | 25 January 1989 |
| Approximate flight hours ⁹ | 21,528 |
| Approximate landings ⁹ | 11,867 |
| Engine type | 2x Garrett turbofan |
| Engine model | TFE731-3 |

The aircraft was equipped with main and wingtip fuel tanks for each engine.

Meteorological information

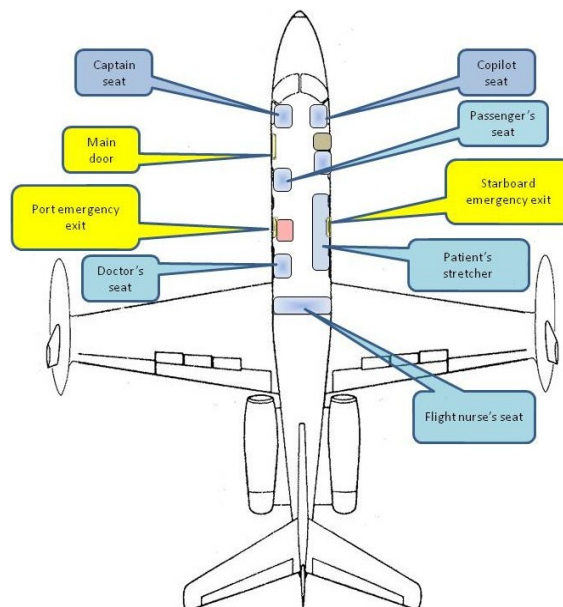
At 0803, the Australian Bureau of Meteorology issued an amended terminal aerodrome forecast (TAF) for Norfolk Island. The amended TAF indicated that the expected cloud base at Norfolk Island airport would descend to 1,000 ft by the time the aircraft arrived at Norfolk Island.

Survival aspects

Seating configuration and safety equipment

The aircraft's seating configuration included two flight crew seats, a passenger's and doctor's seat on the left of the cabin, the patient's stretcher and an unused passenger seat on the right of the cabin, and the flight nurse's seat across the rear of the cabin (Figure 3).

Figure 3: Seating positions



Lifejackets were available for every occupant, and there were two liferafts in the aircraft.

Aircraft ditching

As the aircraft initiated the third missed approach from runway 11, the copilot instructed the passengers to prepare for the ditching.

The passenger, doctor and nurse donned lifejackets in preparation for the ditching. The doctor decided not to put a lifejacket on the patient due to concerns about the potential for a lifejacket to hinder the release of the patient's restraints after ditching. The patient was lying on the aircraft's patient stretcher on the right of the cabin and was restrained by a number of harness straps. The doctor ensured that the patient's harness straps were secure and instructed the patient to cross her arms in front of her body for the ditching.

Liferafts were placed in the aircraft's central aisle ready for deploying after ditching. At the time of the ditching, the two flight crew and the patient were not wearing lifejackets.

The aircraft occupants recalled two or three large impacts when the aircraft contacted the water. The occupants in the front of the aircraft described the impact forces acting in a horizontal, decelerating direction, while the rearmost occupant described a significant vertical component to the impact force.

⁹ Extrapolated from the last logbook entry.

The main plug-type¹⁰ aircraft door was pushed in by the force of the water, which flowed in through the bottom third of the open door space. The pilot in command moved rearwards from the cockpit into the cabin and ascertained that the main door was not usable. Continuing rearwards to the two emergency exits in the fuselage centre section, the pilot in command opened the port emergency exit, and water immediately flowed in through the door opening. The pilot in command exited the aircraft.

The doctor released the patient's harnesses and opened the starboard (or right) emergency exit. Water flowed through the now open emergency exit and the doctor believed that the door opening was completely underwater. The flight nurse, doctor and patient exited the aircraft through the starboard emergency exit.

The copilot sustained injuries from a reported contact with the control yoke during the aircraft's second impact with the water. The copilot was not aware of the pilot in command leaving the cockpit, and may have lost consciousness for a short period of time. The copilot experienced difficulties when attempting to find an exit route from the aircraft by the main door. The copilot then swam rearward along the fuselage, located an emergency exit door by touch, and exited the aircraft.

When the passenger, who was seated immediately behind the main door on the left of the aircraft, released his seat belt, there was little breathing room in the top of the fuselage. The passenger stated that there was no light and that the nose of the aircraft had tipped down. The passenger swam rearwards along the fuselage until he felt an emergency exit door, and exited the aircraft; probably through the port (or left) emergency exit. The passenger believed that he swam upwards some distance before reaching the surface of the water.

All the occupants advised that they exited the aircraft very quickly, and that there had been no

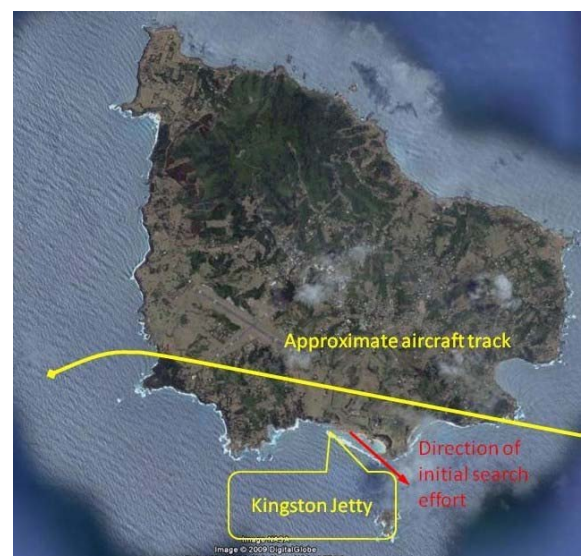
time to take the liferafts. The pilot in command stated that he returned to the aircraft in an attempt to retrieve a liferaft, but it was too dangerous.

The flight crew had previously conducted ditching procedures wet-drill training, which included the simulated escape from a ditched aircraft. Similarly, the medical staff normally flew in aeromedical helicopters, and had previously conducted helicopter underwater escape training. The pilot in command and medical staff stated that their ditching training had helped them when escaping from the aircraft.

Recovery and rescue

The Norfolk Unicom operator had alerted the Norfolk Island emergency response agencies to a local standby condition when the weather first deteriorated to the extent that the Unicom operator felt it might be difficult for an aircraft to land. The Unicom operator subsequently initiated a deployment of the emergency services following the aircraft's second missed approach. In addition, two local boat owners prepared to launch their fishing vessels at Kingston Jetty to search for the ditched aircraft and its occupants (Figure 4).

Figure 4: Approximate runway 29 VOR/DME final approach and overshoot track (Kingston Jetty highlighted)



When Norfolk Unicom lost contact with the flight crew, the airport firemen drove from the airport to Kingston Jetty to help if possible with the recovery

10 A door having inward/upward travel or with retractable upper and lower portions that is larger than the doorway. The tapered edges of the door and doorway mate to increase the security of a pressurised fuselage. Aircraft pressurisation forces the plug door more tightly against the frame of the doorway.

efforts. The first rescue vessel departed to the south-east at 1125, toward the flight path for the missed approach segment of the runway 11 instrument approach.

At about this time, the pilot in command remembered that he had a bright, light-emitting diode (LED) torch in his pocket. He shone the torch beam upwards into the drizzle and towards the shoreline. One of the airport firemen reported that he elected to drive a longer way from the airport to Kingston Jetty, because he believed that it was possible the aircraft had ditched to the west of the island. That route took the fireman along the cliff overlooking the sea to the west of the airport. From that vantage point, he believed he could see an intermittent faint glow in the distance to the west of the island. After watching for a few minutes to satisfy himself he could actually see the light, the fireman reported the sighting to the Emergency Operations Centre (EOC) at the airport. The EOC forwarded the information to the rescue vessel.

In response, the rescue vessel turned and travelled toward the reported position of the light. The crew of the rescue vessel identified a radar return when they were 1.4 NM (3 km) from the aircraft occupants, and sighted the lifejacket lights when they were 1 NM (2 km) from the survivors.

SAFETY ACTION

While there is the possibility for safety issues to be identified as the investigation progresses, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The following proactive safety action in response to this accident has been submitted by those organisations.

Aircraft operator

Aircraft operations

The aircraft operator has advised that, following this accident, a program was initiated to check and revalidate the company's commercial Westwind pilots. The program addressed the company's; policies and procedures, safety management systems, the use and application of threat and error management principles, and the Instrument Flight Rules.

INVESTIGATION ACTIVITIES

The investigation is continuing and will include further examination and analysis of the:

- meteorological information and its effect on the decision making and actions of the crew during the flight
- fuel planning relevant to the flight
- operational requirements that were relevant to the conduct of the flight
- crew resource management
- aeromedical flight classification and dispatch.

MEDIA RELEASE

The Australian Transport Safety Bureau (ATSB) is releasing its Preliminary Factual report into the ditching that occurred 6 km to the west of Norfolk Island on the evening of 18 November 2009 and involved Israel Aircraft Industries Westwind 1124A aircraft, registered VH-NGA. The six occupants evacuated the aircraft as it sank, and were later recovered by a rescue vessel from Norfolk Island.

While the ATSB has yet to establish all the factors relevant to this occurrence, it nevertheless highlights the risks in operating long distance flights to remote island locations which are subject to rapidly changing weather conditions.

As a result of this accident, the aircraft operator commenced a program to check and revalidate the company's commercial Westwind pilots. The program addressed a number of aspects of the company's Westwind operations.

The ATSB has interviewed a number of witnesses and people who were associated with the occurrence, and is assessing the feasibility of recovering the aircraft Cockpit Voice and Flight Data recorders from the seabed.

The investigation is continuing and will include further examination and analysis of the:

- meteorological information and its effect on the decision making and actions of the crew during the flight
- fuel planning relevant to the flight
- operational requirements that were relevant to the conduct of the flight
- crew resource management

- aeromedical flight classification and dispatch.

The remainder of the investigation is likely to take some months. However, should any critical safety issues emerge that require urgent attention, the ATSB will immediately bring such issues to the attention of the relevant authorities who are best placed to take prompt action to address those issues.