

AIR SAFETY INCIDENT INVOLVING F27 AIRCRAFT VH-TFM  
NEAR WYNYARD, TASMANIA, ON 27 OCTOBER 1973

REPORT ON THE INVESTIGATION

INTRODUCTION

On the afternoon of 27 October 1973 Fokker F27 Series 400 aircraft registered VH-TFM, operated by Trans-Australia Airlines was engaged on scheduled Regular Public Transport Flight No. 1497 from Melbourne to Wynyard. It was under the command of Captain M. Denheld with First Officer B.J. Widmer as the other flight crew member. The aircraft carried two hostesses and 28 passengers.

In instrument meteorological conditions, and while offshore in the area between Wynyard and Devonport, the aircraft was reportedly flown at heights below the minimum altitude specified for IFR operations.

NOTIFICATION ASPECTS

The first advice of the alleged incident was received in the Department of Civil Aviation through Trans-Australia Airlines, on the morning of 5 November, 1973. Prior to this time TAA had begun an investigation on 30 October 1973 during which Captain M. Denheld was suspended from flying duties.

HISTORY OF THE FLIGHT

Evidence obtained from the two pilot crew members, airways operations records and recorded radio communications indicate the following sequence of events.

The times given in the attached Departmental records are in Greenwich Mean Time. In this report times are presented as Eastern Standard Time.

Prior to departure of the aircraft from Melbourne there were meteorological conditions forecast for Wynyard, Devonport and Launceston which required fuel to be carried for alternative aerodromes, whilst Hobart required the carriage of 60 minutes holding fuel. The Captain of VH-TFM selected Melbourne as the alternative aerodrome for Wynyard, and the appropriate fuel was carried for this purpose.

At about the same time another TAA F27 aircraft VH-TQQ was flying from Melbourne to Devonport. This aircraft was three minutes behind the Wynyard-bound aircraft. In the course of subsequent events there were communications between these two aircraft.

<u>TIME (EST)</u>	<u>EVENT</u>
1457	VH-TFM, departed Melbourne, planned to cruise at 14,000 feet.
1509	The Wynyard Special weather for 1500 hours, indicating a total cloud coverage at 600 feet, was passed to the aircraft. This communication included advice that Melbourne, (the nominated alternative aerodrome) now required 60 minutes holding fuel. At this stage Captain Denheld decided that, with the fuel available

<u>TIME (EST)</u>	<u>EVENT</u>
1509	only five minutes could be used for an instrument approach at Wynyard, and so he would now plan on Hobart as the alternative aerodrome.
1539	VH-TFM called Wynyard Flight Service Unit (FSU) and advised position as 35 miles by Distance Measuring Equipment (DME) on descent, and that the Aerodrome Terminal Information Service (ATIS) broadcast "Delta", had been received. The captain had decided to make an arrival based on DME procedures, which permitted descent over the water down to 1,200 feet.
1550	VH-TFM advised Wynyard FSU it was "unable to get in visually" and was proceeding to the Devonport area cruising "underneath". When asked for details the aircraft advised it would be at Devonport "on the hour" and that it "was cruising at 800 feet VFR".
1553	VH-TFM established communication with Devonport FSU advising it was "VFC underneath at the moment". The Devonport weather was given to the aircraft as being a cloud base of "500 feet, visibility 4,000 yds, moderate rain". At about this time the DME aid in the aircraft no longer was receiving Devonport.
1554	VH-TFM requested the height of VH-TQQ, which was approaching Devonport and, when advised VH-TQQ was at 4,000 feet, VH-TFM advised it would be climbing to the lowest safe altitude.
1555	VH-TFM advised that it was at 1,500 feet and requested that VH-TQQ maintain 2,000 feet for the time being.
1557	In reply to a request from VH-TQQ concerning the Captain's intentions, VH-TFM advised it was at 2,000 feet proceeding along the coast and was about to divert to Hobart. Details of the Hobart weather were then passed to VH-TFM.
1601	VH-TFM advised its position to VH-TQQ. The latter aircraft advised it would attempt an instrument approach into Devonport by reference to the visual-aural range (VAR).
1602	VH-TFM communicated with Wynyard and advised it was climbing to 10,000 feet, and gave a position as nine miles DME east of Wynyard.
1604	VH-TFM advised it would be departing Wynyard for Ironstone, a reporting point on the Wynyard to Launceston or Hobart route.
1608	Wynyard FSU requested diversion details from VH-TFM. In reply VH-TFM requested advice on the Launceston weather.

Thereafter procedures were normal. The aircraft, VH-TFM landed at Launceston at 1641.5 hours after making an instrument approach by reference to the instrument landing system (ILS).

THE REPORT PROVIDED BY THE CAPTAIN

The captain has stated that he planned initially to follow the DME arrivals procedure into Wynyard. He claimed that, shortly after descending to 1,200 feet, and at a point close to 14 miles by DME from Wynyard, he turned the aircraft left onto an easterly heading and commenced further descent. His purpose in doing so was to ascertain which aerodrome - Wynyard or Devonport - offered the better prospect of a landing. He stated that the north coast of Tasmania was clearly identifiable on the aircraft radar and that the aircraft was at no time less than eight or nine miles from Wynyard. When passing through 700 to 650 feet, breaks in the cloud were observed and visual contact was established with the water. The Devonport DME was received and indicated 19 miles.

Descent was continued to 300 feet but the cloud base did not improve, and the Devonport DME ceased to register in the aircraft. He stated that, while at low level, the visibility ahead was never less than three miles. When he decided that he could no longer proceed, a left hand climbing turn was made back toward Wynyard with the intention of diverting to Hobart. Course for Hobart was set over Wynyard at 5,500 feet, on climb to 10,000 feet. At a later time a clearance was obtained for diversion to Launceston.

THE REPORT PROVIDED BY THE FIRST OFFICER

The first officer has stated that a descent was begun outside controlled airspace when 50 miles by DME from Wynyard. The DME arrival procedure was adopted and, when at 1,000 feet above the minimum stipulated height of 1,200 feet, and again at 500 feet above, he advised the captain of these critical points as is required. Nevertheless, the descent was continued through the minimum altitude and the first officer then called "minimum minus 100 feet" and later "minimum minus 200 feet". The captain then requested he keep a good look-out outside the aircraft.

Breaks in the cloud were first seen at 500 feet. At 300 feet the aircraft broke substantially through the main cloud base and continued toward the coast, in restricted visibility caused by ragged cloud below the main base and light rain. At three or four miles DME Wynyard the aircraft was turned easterly while still over the sea, and the descent was continued to 100 feet. Heights varying between 200 and 100 feet were maintained for about five minutes. At the time that the captain reported that the aircraft was "800 feet VFR" the aircraft was at 100 feet above the sea. Flight was continued toward Devonport and heavy rain was encountered in which the forward visibility was zero and the sea, 100 feet below, could only be seen through rain and lower patches of cloud.

When the Devonport DME was no longer received at about 14 miles the aircraft was turned left and a climb was commenced. The aircraft proceeded to an area west of Wynyard from where course was set for Hobart. The first officer has said that at no time did he see the coast of Tasmania.

THE REPORT OF THE CABIN CREW

The two hostesses comprising the cabin crew have said that, after what seemed like several attempts to reach Wynyard, there were questioning looks from some passengers but when one hostess approached the cockpit for information she was waved away by the first officer. In this period they could see the white caps on the water and believed the aircraft was lower than they had experienced before. Because of this they privately refreshed each other on their emergency procedures but took no action with the passengers.

WEATHER DETAILS

The weather situation over Victoria/Tasmania on the day was a frontal trough moving from west to east. Melbourne was expected to have a 5/8th cloud coverage in the relevant period with a base of 1,000 to 2,000 feet, and some rain. This was expected to deteriorate with the passage of the front, bringing cumulo-nimbus cloud, further rain and reduced visibility in rain showers. In view of this forecast Melbourne Operations Control imposed a requirement of 60 minutes holding fuel for flights proceeding to Melbourne.

The northern coast of Tasmania was similarly affected with Wynyard and Devonport expected to experience strong easterly winds, a visibility of four miles and low cloud down to 700 feet at Wynyard and 900 feet at Devonport. Some improvement was expected after the passage of the front. In the same period Launceston was expected to have better conditions with greater visibility and a cloud base of 4,000 feet, but with some low patches of cloud for short periods between 1500 and 2400 hrs.

The Hobart forecast over the period 1600 to 2400 hours was for reasonable weather for aircraft operations with a short-period deterioration of perhaps an hour, when low cloud down to 900 feet and restricted visibility of 3000 yards in rain and drizzle were expected.

In view of these weather forecasts the captain's decision at the time of his departure from Melbourne to plan for Melbourne as the alternative for Wynyard was sound. Following his decision not to return to Melbourne to take on additional fuel when advised of the 60 minutes holding requirement, the decision to plan for Hobart as the alternative was also sound. However, he did not advise air traffic control of this change in his flight plan when the decision was made, as he should have, hence the surprise of the Flight Service Officer at Wynyard when he was informed that a diversion to Hobart had been commenced.

FLIGHT PLAN

The flight plan for the aircraft was correctly made out and covered all operational requirements.

DESCENT PROCEDURES

On being advised after departure of the 1500 hours Wynyard Special Weather Report, the captain had a choice of three descent procedures. The easiest of the three was a DME arrival procedure which permitted a steady descent from the north toward Wynyard, down to 1200 feet. The basis of the

altitude limit at Wynyard is the position of a radio mast south of the aerodrome which extends to 790 feet above mean sea level. The alternative descent procedures were a non-directional beacon let down and a DME let down. These procedures are similarly restricted to 1200 feet and 1500 feet minima respectively because of nearby ground obstructions.

If the aircraft did not become visual at 1,200 feet over Wynyard, instrument approach procedures were also available at Devonport, 34 miles to the east, where descent is permitted to 700 feet over the water using the DME arrivals procedure, and to the same altitude of 700 feet using the VAR.

Launceston and Hobart, further away, offered approach and landing aids in the form of ILS allowing safe descent to lower altitudes.

#### DESCENT BELOW THE MINIMA AND ALTERNATIVE ACTIONS

From the evidence of the two pilots it is clear that the captain decided early in the flight that he would follow the DME arrival procedure into Wynyard. No discussion took place between the two pilots concerning the relative merits of the two alternative approach procedures, nor was there discussion of the procedures to be employed in the event that the aircraft did not become visual at the minimum height. Despite the fact that the weather forecast and reports indicated a cloud base substantially below the minimum height for instrument approach at Wynyard, the captain was at liberty to attempt a descent using the radio aid procedures but he is required to abandon it if he cannot proceed visually at the minimum height.

The captain, on receiving confirmation of the Wynyard weather by receipt of the broadcast aerodrome terminal information when 35 miles from Wynyard, decided at that time that he would continue the descent below the 1,200 feet minimum height. Thus the action was one which he had time to consider and the situation which he encountered at the minimum height was not unexpected or affected by an emergent circumstance.

When the cloud base was seen to be even lower than was forecast, with only occasional breaks at 700 to 650 feet, there is little doubt that the original intention to attempt a break through of the cloud base at about that height was extended in an attempt to achieve visual flight at any usable altitude for an assessment of the weather situation. Once the aircraft had turned easterly away from the track being flown into Wynyard, it was no longer on any route approved by the Department. Nevertheless, the aircraft was not in any immediate danger of striking any land mass since the coast was clearly seen on radar.

In his attempt to reach Devonport, the position of F27 VH-TQQ compromised the captain's intention since separation between the two aircraft had to be considered. Although vertical separation could be maintained with the co-operation of the other crew, lateral separation could no longer be guaranteed when the Devonport DME failed to register in VH-TFM.

In the circumstances described, any loss of radio communication or any serious aircraft unserviceability which might have arisen could have placed both aircraft in jeopardy, since they were operating in relatively close proximity to each other under instrument flight conditions.

It is clear from the evidence that the captain of VH-TFM, first of all, ignored the minimum safe altitude of 1,200 feet prescribed for his instrument approach to Wynyard when he found his aircraft still in cloud on reaching that height. He continued to much lower heights to assess the weather situation and then turned his attention to Devonport as an objective and attempted to reach that aerodrome using a quite unsafe flight procedure entirely of his own devising.

In the circumstances Devonport was a worthwhile objective since the minimum safe height for instrument approaches to that aerodrome is 500 feet lower than at Wynyard and may well have permitted a safe descent to visual flight conditions. Devonport could have been reached, however, quite safely by proceeding over Wynyard thence via the prescribed coastal route at above the lowest safe altitude of 3,300 feet. The captain of VH-TQQ, the Devonport bound aircraft at about the same time was able to carry out a VAR approach and land. This opportunity existed also for the captain of VH-TFM without hazard to his aircraft and without any significant additional delay.

#### FUEL REQUIREMENTS

Post-incident fuel calculations based on the time of departure of VH-TFM from Melbourne, and the flight times of the aircraft at the various altitudes and heights, have shown that the fuel requirements for the flight were not prejudiced at any time. Either from Ironstone or from Launceston if a landing there had been unsuccessful, Hobart could have been reached with an adequate margin of fuel including the specified 60 minutes holding fuel plus normal reserves.

#### FAILURE OF THE DEVONPORT DME TO REGISTER IN VH-TFM

The proper functioning of the Devonport DME is continuously monitored and there was no malfunction during the period of this flight. The failure of the Devonport DME to register in the aircraft while inbound at about 14 miles is considered to have been a function of the low altitude at which the aircraft was flown.

#### THE FLIGHT DATA RECORDER READ-OUT

The Flight Data Recorder, which records aircraft heading, indicated airspeed, altitude and vertical acceleration against operating time was removed from the aircraft and examined in the course of this investigation. The data enabled graphs to be drawn showing the heading, airspeed and altitude at co-incident periods of the flight, and such a graph has been prepared covering the period of flight in the vicinity of Wynyard.

The altitude trace shows that the descent from the aircraft's cruising level of 14,000 feet was begun 17 minutes before the expected time of arrival at Wynyard. During the period of this descent the aircraft's heading approximated that required for the 1590M track from the West Bass reporting position to Wynyard. The aircraft maintained this heading for 15 minutes after commencement of descent at which time the recorded altitude was below 300 feet, and it then began a left turn onto an easterly heading.

On completion of the turn the aircraft continued on an approximate easterly heading at recorded altitudes below 300 feet for the next four minutes before commencing a left climbing turn onto a westerly heading. Except for one short period of descent after the climb was begun, the aircraft, after completing the turn, continued to climb on the westerly heading for a further five minutes until at a height of 4,500 feet another left turn was begun onto a heading close to that of the track from Wynyard to Ironstone. Some eight minutes later the en-route altitude of 10,000 feet was reached.

The most significant feature of the flight data record is that the aircraft was below 1,200 feet in the vicinity of Wynyard for approximately eight minutes and for nearly six minutes was below three hundred feet. The lowest recorded altitude was 118 feet although a tolerance of up to  $\pm 60$  feet for system accuracy might be applicable.

The data provided by the recorder supports the description of events given by First Officer Widmer with regard to the continued descent below 1,200 feet toward the coast, as well as the heights at which the aircraft was subsequently flown. It also substantially supports his statement that the aircraft was at a height of about 100 feet when the captain reported to the FSU "cruising at 800 feet VFR".

#### INSTRUMENT FLIGHT RULES REQUIREMENTS

The aircraft was required to be operated under the Instrument Flight Rules and, in accordance with the provisions of Air Navigation Regulation 157(3), it was required to be flown along each route segment at a height not less than the designated lowest safe altitude. The Departmental Aeronautical Information Publication, at MAP AUS/RNC 1 specifies this height to be 1,990 feet over the route between the reporting point West Bass and Wynyard, but it further specifies that, for an approach to Wynyard using the DME arrival procedure, the aircraft may descend to 1,200 feet by day at 15 miles DME from Wynyard and, in instrument meteorological conditions continue not below that altitude. If visual flight is established the pilot may then begin a visual approach below 1,200 feet, but if visual flight is not established before passing over the directional beacon at Wynyard the pilot is required to carry out a missed approach, and climb to 2,500 feet on a heading of 030°M.

#### MOTIVATION.

Some consideration must be given to the motivation of the captain in taking the actions he did. During the investigation interviews an attempt was made to determine the decision making processes which led to the below minima flight. The following points are perhaps relevant:

- . All passengers aboard the aircraft were destined for northern areas of Tasmania, and a diversion, particularly to a port other than Devonport, would have inconvenienced them and the operator.
- . The crew had operated together for six days and the captain has stated that a good working relationship did not exist.

- . The flight crew's period of duty was due to expire and any delay jeopardised the return to their home base of Melbourne on that day.
- . A landing at Wynyard and return to Melbourne was the procedure which would have provided the quickest relief from duty.
- . If a landing could have been made at Wynyard the reported weather conditions were such that no impediment to the subsequent take-off was likely.
- . The aircraft radar clearly established the position of the aircraft over the water in relation to the coastline and so the captain was confident that no collision risk with obstructions existed.
- . The previous practices of the pilot in New Guinea whilst operating into coastal airports in limited visibility seemed to him to be suitable for this approach into Wynyard.
- . The belief that the approved instrument approach procedures for Wynyard were unnecessarily restrictive.
- . The general weather situation for all Tasmanian aerodromes and Melbourne was not good and any unexpected further deterioration would constitute a real hazard to the aircraft whilst it remained airborne.

In some manner or degree perhaps all of these factors had some influence on the decision of the captain and there may have been others. Fundamentally, however, it is apparent that the captain was not sufficiently impressed with the importance of strict adherence to the safety standards and procedures laid down. The possibility that he had followed similar practices in Papua New Guinea without detection or accident is irrelevant to that basic issue. He has not been involved in any previous accident or incident reported to the Department of Civil Aviation, reflecting adversely upon his competence. Furthermore, he now says that he regrets his decision to depart from the standards laid down but it is apparent from his statement that he still adheres to the belief that the procedure he followed did not endanger his aircraft or its occupants. In these circumstances the fact that his training and experience has conditioned him to the belief that he need not adhere to the prescribed safety standards seems to have been the most important element in the error of command judgement committed.

#### CONCLUSIONS

On 27 October 1973, Fokker F27 aircraft VH-TFH operated by Trans Australia Airlines, was engaged on Regular Public Transport Flight No. 1497 from Melbourne to Wynyard. It was under the command of Captain M. Denhold, with First Officer B. Widmer the other flight crew member. There were 32 persons on board.