Aviation Safety Investigation Report 199600399

Piper Aircraft Corp Chieftain

08 February 1996

Readers are advised that the Australian Transport Safety Bureau investigates for the sole purpose of enhancing transport safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purposes.

Investigations commenced on or before 30 June 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced after 1 July 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with the Transport Safety Investigation Act 2003 (TSI Act). Reports released under the TSI Act are not admissible as evidence in any civil or criminal proceedings.

NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Aviation Safety Investigation Report

199600399

Occurrence Number: 199600399 **Occurrence Type:** Accident
Location: 3.5km SE King Island, Aerodrome
State: TAS **Inv Category:** 3
Date: Thursday 08 February 1996
Time: 0507 hours **Time Zone** ESuT
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**1**

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-31-350
Aircraft Registration: VH-KIJ **Serial Number:** 31-7405222
Type of Operation: Charter Cargo
Damage to Aircraft: Destroyed
Departure Point: Moorabbin Vic
Departure Time: 0410 ESuT
Destination: King Island Tas

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL	106.4	5519

Approved for Release: Tuesday, March 18, 1997

FACTUAL INFORMATION

History of the flight

A witness heard the aircraft pass King Island aerodrome at 0455 EST at the same time as he noticed the pilot-activated 10/28 runway lights illuminate. The pilot reported to Melbourne Control that he would be completing a runway 10, non-directional beacon (NDB) approach. A short time later he broadcast that the aircraft was at the minimum descent altitude, which is 640 ft above mean sea level (AMSL) for a runway 10 NDB approach. He also broadcast that there was a complete cloud cover. The aircraft did not enter a missed approach procedure but was heard to fly towards the south-east from overhead the NDB, which is located 1.3 km south-south-west of the centre of runway 10/28. A second witness, located near the NDB site, reported observing the aircraft's lights to the south-east. At 0507 a farmer heard the aircraft pass low over his house shortly before it crashed into trees, 3.5 km south-east of the aerodrome. The first responders arrived at the accident site at about 0530. The pilot had not survived.

Damage to aircraft

Parts of the aircraft were torn off by tree and ground impact. However, the fuselage remained substantially intact until it was destroyed by fire after it had come to rest.

Pilot information

The pilot was correctly qualified and endorsed to perform the flight. He held an air transport pilot (aeroplane) licence, a night visual flight rules rating and a current multi-engine command instrument rating.

The pilot's total flying experience included 185 hours at night, of which 36 hours were as pilot in command, 6 hours as dual and the rest as co-pilot in twin turbine-engine regular public transport aircraft. He was approved to fly as pilot in command of charter operations to King Island in Piper PA 31 Chieftain aircraft on 9 May 1995 following company check flights with the chief pilot. The pilot had completed 104 flights to King Island, mostly in daylight, but not all in Chieftain aircraft. He had flown from Moorabbin to King Island at night as pilot in command of Chieftain aircraft on three occasions since 9 January 1996.

The pilot flew for the King Island operator on a part-time basis. His normal full-time employment involved flying Metroliner aircraft (a twin-engine turboprop aircraft with a maximum weight exceeding 5,700 kg) as co-pilot for a domestic airline. As co-pilot, he had accrued 1,837 hours. The pilot was on annual leave from his full-time employer at the time of the accident.

To be promoted to pilot in command of a Metroliner the pilot had to first accrue 500 hours as pilot in command of multi-engine aircraft operating under instrument flight rules. This was to comply with Civil Aviation Order 82.3. To meet this requirement, the pilot's full-time employer gave him permission to work part-time for the smaller regular public transport / charter operator. At the time of the accident he still needed to accrue a further 247 hours.

It was reported that the pilot was well rested prior to the accident flight. The tape recordings of the pilot's radio calls, made shortly before the accident, do not indicate he was suffering any significant stress.

The pilot passed his last aviation medical examination on 23 February 1995. There were no restrictions on his medical certificate. He was not known to be suffering from any ailment.

No evidence was found to indicate that the pilot had ever experienced the combined conditions of flying an NDB approach to the minimum descent altitude, with the cloud cover at or near that altitude, and at night in very dark conditions with no ground lighting apart from runway lights. No evidence was found that he had flown circling approaches in simulators under simulated dark night conditions. However, during his experience as a co-pilot on turboprop aircraft, he had flown at night to aerodromes which had a low level of ambient light.

Meteorological information

The pilot received an AVFAX of relevant weather forecasts prior to the flight. He discussed the AVFAX contents with another company pilot who was also planning an early morning flight to King Island in a Chieftain. The AVFAX included the aerodrome forecast for Moorabbin, the relevant area forecast, and the aerodrome forecast for King Island.

At hourly intervals the automatic weather station at King Island aerodrome measured and recorded wind velocity, air temperature, dew point temperature, QNH, and rainfall. These readings were transmitted electronically to the Melbourne control operator within one minute of their recording. Also, a trained weather observer estimated and recorded the cloud amounts and heights at three-hourly intervals.

At 0500 the King Island aviation special weather report was wind 320 degrees at 5 kts, temperature 15 degrees, dew point 15 and QNH 1003. No evidence was found that the pilot received the 0500 weather report. The 0300 and 0600 observations included a report of a complete cloud cover. No cloud base was reported at 0300. At 0600 the base was reported as 1,000 ft above ground level.

A post-accident Bureau of Meteorology assessment indicated that the meteorological situation at King Island at 0507 on 8 February 1996 would have included complete cloud cover with a base at 1,000 ft above ground level, or possibly lower, with the possibility of fog or mist.

A ground witness at King Island aerodrome reported that he did not see the aircraft or its lights when he heard it fly near the aerodrome at the beginning of the NDB approach. A policeman who drove to the accident site from Currie, about 20 minutes after the accident, advised that conditions were very misty and very dark.

A second pilot from the same company flew a Chieftain to King Island, arriving shortly after the accident. At 0525, he commenced the runway 10 NDB missed approach from 1.6 km west-north-west of the runway 10 threshold. He conducted the missed approach because the runway lights were intermittently obscured by cloud below 640 ft AMSL and there was fog in the area. The aircraft returned to Moorabbin.

Aids to navigation

The only ground-based approach aid for aircraft arriving or departing from King Island aerodrome is the NDB. Several other NDB approaches were conducted at King Island on the day of the accident. No problems were reported concerning the serviceability of the King Island NDB.

Communications

Communications between Melbourne Control and VH-KIJ en route to King Island were excellent. At 0445 the pilot reported that he was changing to the King Island mandatory broadcast zone frequency. At 0451 he reported to Melbourne Control that he was going to conduct an NDB approach. At 0502 he advised that he would call Melbourne Control again by 0505. At 0506, the controller asked the pilot to confirm that operations were normal. When there was no reply, he attempted to contact the aircraft several times until 0510. After that he requested the pilot of the second Chieftain, estimating overhead King Island at 0510, to try to ascertain if KIJ had landed safely. No radio transmissions were recorded from the pilot of KIJ after 0502.

The last comment by the pilot of KIJ, made on the mandatory broadcast zone frequency and recorded on the King Island aerodrome aircraft movement recording tape, was for another party to stand by. The operator's agent at King Island aerodrome, reported that he had attempted to contact the pilot by radio but was unsuccessful. The pilot's comment was probably a response to this transmission. It was not possible to determine the time that the comment was made. At no stage did the pilot advise of an in-flight problem.

Aerodrome information

King Island aerodrome had three runways. Only runway 10/28 was equipped with runway lights. The lights were pilot-activated and standby power was available. The runway 10/28 lights were activated when KIJ first passed the aerodrome and remained on until after the accident. Runway 10/28 was 1585 m long and 30 m wide. No visual approach slope indicator system was installed. Three unlit obstacles were clearly depicted on the Civil Aviation Safety Authority's aerodrome chart but only the NDB was marked on the Jeppesen charts used by the pilot. These were the NDB mast at 238 ft AMSL, a second mast at 173 ft AMSL, and third mast at 152 ft AMSL.

A mandatory broadcast zone with a radius of 15 NM was centred on King Island aerodrome.

During the investigation pilots reported that the area around King Island aerodrome had low ambient lighting at night. In hazy or misty conditions or when there was extensive cloud cover there was often no visible horizon and no lighting other than the runway lights to provide a visual reference point.

Terrain/obstacles

King Island aerodrome elevation was 132 ft AMSL at its reference point. The highest obstacle within the prescribed 2.66 NM circling area was the NDB mast at 238 ft AMSL. From the air by day, the terrain within the prescribed circling area looked quite flat. However, the tops of the trees involved in the initial impact were estimated to be 227 ft AMSL.

Runway 10 NDB instrument approach

The minimum sector altitude for a radius of 25 NM was 1,800 ft AMSL. The outbound track for category B aircraft (which includes the Chieftain) was 325 degrees for 2.5 minutes. Aircraft were required to be established on the inbound track of 130 degrees not below 1,300 ft AMSL. Minimum descent altitude was 640 ft AMSL. Circling minimum was 740 ft AMSL. A missed approach required a climb, from overhead the NDB, on 130 degrees to 1,800 ft AMSL.

The pilot used Jeppesen charts which showed the minimum descent altitude for the runway 10 NDB approach as 540 ft AMSL with actual aerodrome QNH set on the altimeter sub-scale, and 640 ft AMSL with forecast QNH set.

Emergency locator transmitter

The aircraft was not fitted, nor was it required to be fitted, with an emergency locator transmitter.

Wreckage, flight path and impact information

Within the limitations created by the post-impact fire, no evidence was found that aircraft components or systems were factors in the accident. The landing gear was down and the flaps were estimated to have been extended to 15 degrees at impact. A ground witness reported that the engines sounded as if they were normal and producing power immediately prior to impact. Post-accident inspection indicated that the engines should have been capable of normal operation and that they were producing power at impact.

Witness information and post-accident flight tests indicated that the aircraft probably tracked 135 degrees from the NDB for 3 km before commencing a 30-45 degree banked left turn towards the threshold of runway 28. The aircraft was left wing low and heading 360 degrees when it collided with trees during the turn. The aircraft had descended from 640 ft AMSL to 227 ft AMSL prior to impact.

Altimeters

The aircraft was equipped with two barometric altimeters which were severely burnt during the accident. It was not equipped, nor was it required to be equipped, with a radar altimeter. One altimeter retained a sub-scale setting of 1007 hectopascals. The other altimeter was too damaged for the altimeter setting to be ascertained. Forecast QNH for departure Moorabbin was 1007 hectopascals. On the AVFAX received by the pilot prior to departure, the forecast local QNH for his arrival at King Island was 1005. At 0415, Melbourne Control advised the pilot that area QNH was 1007. In contrast, the QNH recorded by the King Island automatic weather station, seven minutes before the accident, was 1003. This reading was passed to the Melbourne Control operator within one minute of its recording. Had the pilot requested an updated QNH from Melbourne Control shortly after 0500 he would have been given 1003.

The sub-scale setting on the altimeter being referenced by the pilot could not be determined. The company chief pilot reported that both altimeters in KIJ had been accurate to within plus or minus 20 ft during flights prior to the accident. The allowable instrument flight rules tolerance was plus or minus 60 ft with an accurate QNH set. A sub-scale error of +4 hectopascals (1007 instead of 1003) could result in the aircraft flying 120 ft lower than expected.

Medical information

The post-mortem and toxicology tests performed on the pilot revealed no medical problem which may have contributed to the accident.

Fire

No evidence was found of in-flight fire. There was a post-impact fire which destroyed most of the aircraft.

Survival aspects

The accident might have been survivable except for the post-impact fire.

Possible misinterpretation of visual circling criteria

No evidence was found to indicate that the pilot would have deliberately descended the aircraft below the circling minima prior to becoming visual.

After discussions with several very experienced instrument-rated pilots, approved testing officers, chief flying instructors, chief pilots and flying operations inspectors, it became apparent that many instrument-rated pilots continued to misinterpret the departure and approach procedures set out in Airservices Australia's Instrument Approach and Landing Charts, page 2, paragraph 1.5, and in particular note 1.

The following extract from Aeronautical Information Publications - Visual circling is relevant to the accident:

"When visual reference has been established within the circling area at or above the minimum descent altitude, further descent below the minimum descent altitude may occur provided that: a. the aircraft is maintained within the circling area; b. visual reference can be maintained; c. the approach threshold or approach lights or other markings identifiable with the approach end of the runway to be used are visible during the subsequent visual flight; and d. obstacle clearance of at least 300 ft (category B) is maintained along the flight path until the aircraft is aligned with the runway, strip or landing direction to be used.

"Note 1: For the purpose of this paragraph visual reference means clear of cloud, in sight of ground or water along the flight path, and with a flight visibility not less than the minimum specified for circling."

The aircraft crashed within the prescribed circling area. Whether the pilot maintained at least the 2.4-km minimum visibility specified for visual circling is unknown.

This investigation determined that many pilots misinterpret the words "in sight of ground or water" to mean no cloud is anticipated between the aircraft and the ground or water along the flight path, whether by day or night, despite not being able to see the ground, water or obstacles. Some pilots believe it acceptable to have 4/8 of cloud below the aircraft at night during a 300-ft obstacle clearance circling approach in very dark conditions. Other interpretations were also evident.

Research has indicated that many pilots in their training have been taught a wrong interpretation of the meaning of "in sight of ground or water along the flight path."

The authoritative interpretation from the Civil Aviation Safety Authority is that "in sight of ground or water along the flight path" means that pilots must be able to physically see the ground, water, and obstacles along the flight path before descending below the minimum descent altitude to apply a 300 ft obstacle clearance buffer.

Previous action on misinterpretations of visual circling criteria

In the Bureau's report 9301743 of the accident involving Piper PA-31-350 Chieftain VH-NDU at Young NSW on 11 June 1993, BASI interim recommendation IR930231 recommended that the Civil Aviation Authority review:

"(a) the adequacy of instructions to flight crew for maintaining a safe height above terrain at night, and

"(b) the phraseology used in aeronautical information publications, departure and approach procedures, instrument and approach and landing charts, paragraph 1.5 with a view to making it less susceptible to misinterpretation".

As a result of this recommendation the Civil Aviation Authority modified the words in the Aeronautical Information Publications to read as follows: "visual reference means clear of cloud, in sight of ground or water along the flight path".

From the same report BASI interim recommendation IR9300234 recommended that the Civil Aviation Authority review the obstacle terrain guidance information provided for flight crew in other than high capacity regular public transport operations. This review was intended to ensure that flight crew have an adequate knowledge of terrain associated with the route flown, including obstacle terrain information for non-precision and circling approaches. The following is part of the Authority's response:

"The requirement to avoid obstacles by 300 feet is to be complied with using visual reference only, ie. the pilot must be able to ensure all obstacles lit or unlit are avoided visually. At night this may not be possible. Thus the pilot may only be able to descend when he is aligned with the landing runway and able to use the documented obstacle limitation surface, and, the Civil Aviation Authority will review the practices of other authorities in respect to the provision of terrain information on instrument approach charts with a view to determining whether the current practices need to be changed".

BASI investigation report 9302851 of an accident involving Piper PA-31-350 Chieftain, VH-WGI, in Tasmania, was produced after report 9301743. Report 9302851 identified that the visual circling criteria continued to be misinterpreted despite the fact that the Civil Aviation Safety Authority had amended information on visual circling contained in Aeronautical Information Publications.

Night visual approaches

During a visual approach, a pilot relies on a combination of visual cues and instrument indications to judge the flight path, rate of descent and closure rate. However, clearance from the ground is maintained by visual reference only. During an instrument approach, ground clearance is maintained by reference to a set instrument flight path and an established minimum altitude until the ground is in sight.

When conducting night visual approaches where there are overcast conditiions, low levels of ambient light and no visual cues on the ground prior to the runway lights, pilots are less able to adequately judge rates of descent and closure rates appropriately. In many previous accident investigations and research studies using simulators, these "black hole" conditions have been associated with pilots flying low approaches and impacting the ground before the runway threshold. However, the same conditions can also produce high approaches. The black hole conditions in this accident were also exacerbated by the lack of a defined horizon or other visual cue information on the ground beyond the runway lights.

Previous Bureau investigations of night take-off and landing accidents have determined that pilots often have difficulty accepting that operating conditions do not meet the requirements for visual flight, particularly when they can see the runway or helipad lights and there appears to be adequate visibility. However, in black hole conditions a pilot must revert to instrument approach procedures to ensure an adequate level of safety. At many aerodromes this is not an option as there is no precise approach aid. Consequently, pilots often persist with a visual approach despite the conditions.

Automatic weather stations

An automatic weather station was installed at King Island. This provided information electronically to the air traffic service operators in Melbourne. This information was available to the pilot on request.

Automatic weather information broadcast facilities have been established at a number of airports throughout Australia. More automatic weather information broadcast facility installations are planned. The automatic weather information equipment, which is linked with the automatic weather station, normally transmits weather information on the airport navigation aid frequency. Information from Airservices Australia suggests that the locations of automatic weather information broadcast facilities are determined by the aviation industry and the Bureau of Meteorology.

King Island is currently serviced by four airlines and a number of charter operators. At present Airservices Australia has no plans for an automatic weather information broadcast facility to be installed at King Island.

Statistics of similar accidents

During the investigation a search of Bureau of Air Safety Investigation and National Transportation Safety Board (USA) records for similar occurrences was completed.

Recent Australian accidents identified were:

- BASI investigation report 8802354, Piper PA-31-350 Chieftain, VH-HOX, Coffs Harbour NSW, 7 April 1988; fatal accident at night within the circling area in marginal weather.

- BASI investigation report 9301743, Piper PA-31-50 ,VH-NDU, Young NSW, 11 June 1993; fatal accident at night within the circling area in marginal weather.

- BASI investigation report 9302851, Piper PA-31-350 Chieftain, VH-WGI, Tasmania, 17 September 1993; fatal accident at night within the circling area in marginal weather.

A computer search of US accident records since 1991 disclosed 17 accidents in which aircraft flew into the ground within the circling area in dark-night conditions. Most of these accidents involved instrument flight rules flights and marginal weather.

ANALYSIS

Accident location

The accident site and aircraft configuration were consistent with the aircraft being on a left base turn for runway 28. Wind conditions were suitable for a landing on runway 10 or 28. Had the pilot intended to land on runway 10, there was no reason for the aircraft to fly so far south-east of the NDB before turning towards the north.

Obstacle clearance

After 104 flights to King Island, the pilot was probably confident that he could avoid the obstacles within the circling area. However, it was possible that the pilot was unaware that the terrain/obstacles to the south-east were about 100 ft higher than the aerodrome reference elevation.

Final flight path

The evidence provided about the misinterpretation of the visual circling criteria may be relevant to the pilot's actions. Information from the witness who reported seeing the aircraft's lights indicates the aircraft had probably descended below the cloud base prior to or during the final turn. Despite this, the reported weather conditions of a dark and misty night with no defined horizon and no ambient lighting made it unlikely that the pilot could maintain visual contact with the ground or obstacles as required by the circling criteria. He would however, have been able to see the runway lights. If the pilot was not aware of the correct meaning of the criteria, he probably assumed that having only the runway lights in sight was acceptable. Consequently, he continued a visual approach in conditions that were not suitable for visual flight.

Accident investigation and anecdotal evidence indicate that pilots are reluctant to accept that conditions do not always meet visual requirements when they can see the runway or helipad lights during an approach, especially in marginal weather conditions on a dark night. This lack of acceptance often leads to misjudgment of the aircraft's performance during the approach which, in turn, can lead to unexpected ground impact.

Because the pilot did not request updated QNH information, it is probable that he did not have the King Island QNH of 1003 hectopascals set. This would have resulted in the aircraft being closer to the obstacles than the pilot realised.

As the pilot had few visual cues during the turn, he would have relied on the altimeter and vertical speed indicator to help judge his descent rate. At the same time he would have needed to check the aircraft's position in relation to the runway by reference to the runway lights. This regular transition between visual and instrument flight, in what were instrument flying conditions, probably distracted the pilot to the point where he was unaware of the proximity of the trees until it was too late to prevent the impact.

The evidence indicates that it is unlikely that the pilot had encountered a similar combination of conditions in either his flying or training experience.

The combination of a misunderstanding of the circling criteria, lack of adequate visual conditions, lack of recognition that adequate visual conditions did not exist, the black-hole effect, incorrect QNH, distraction and lack of experience probably caused the pilot to misjudge the descent rate during the approach to runway 28.

The Bureau believes that AIP/DAPS IAL-2, 1.5 should be amended to clarify the instruction and differentiate between day and night circling approaches due to the apparent misunderstandings of the circling requirement. The difficulties of maintaining visual reference with the ground or water at night should also be considered. Clear visual sighting of ground obstacles is almost impossible at night. Therefore a different limitation may be appropriate.

The Bureau is also concerned that the obstacle clearance heights of 300 ft for category A and B aircraft, and 400 ft for category C and D aircraft, leave very little margin for height deviation. During the high workload of circling approaches, as the aircraft configuration changes with flap and landing gear extension, an inadvertent height loss of 200-300 ft could occur. Pilots are not required to demonstrate a visual circling approach at minimum obstacle clearance height as part of the initial instrument rating test and renewals.

SIGNIFICANT FACTORS

1. The pilot continued a visual approach in conditions which prevented him from maintaining adequate visual clearance from the ground or obstacles and which made visual judgement of the approach difficult.

2. The pilot probably did not recognise that the conditions were not suitable for a visual approach.

SAFETY ACTION

As a result of the investigation, the Bureau of Air safety Investigation issued interim recommendation IR960027 to the Civil Aviation safety authority on 28 August 1996.

"IR960027

"The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

"(i) amend AIP/DAPS IAL-2, 1.5 to clarify the intent of the instruction and differentiate between visual circling approaches conducted during the day and at night;

"(ii) critically review the obstacle clearance height to assess whether these minimum heights are appropriate from an operational viewpoint; and

"(iii) require pilots to demonstrate a visual circling approach at the minimum obstacle clearance height during the test for their instrument rating and at subsequent renewals."

The Civil Aviation Safety Authority responded on 12 November 1996 as follows:

"I refer to your interim recommendation IR960027 concerning the accident involving PA31-350, VH-KIJ at King Island on 8 February 1996.

"(i) AIP amendment List 17, effective 5 December 1996, includes a revision of DAPS IAL 2, para 1.5. The revision clarifies requirements for visual circling which are:
applicable by night or day, and applicable only during daylight.

"An AIP SUP addressing the AIP changes has been produced with an effective date of 7 November 1996.

"(ii) 300 feet minimum obstacle clearance is the internationally accepted requirement for visual circling for Category A and B performance aircraft as published in ICAO PANS OPS Doc 8168. The Civil Aviation Safety Authority does not have any evidence to indicate that a trained and recent pilot who is attempting to comply with the obstacle clearance requirements specified for visual circling is placing his or her aircraft in an unsafe situation. The revised text of AIP DAP IAL 2 para 1.5 will further promote safety in this regard by clarifying the requirements for visual circling at night and advising pilots to maintain the maximum practical obstacle clearance during visual circling.

"(iii) Appendix 1 of CAO 40.2.1 specifies the flight test requirements for the initial issue and renewal of instrument ratings. Para 2.1 (f) of the Appendix specifies that the applicant shall demonstrate proficiency conducting a circling approach. However, the present flight test form for the conduct of an instrument rating test does not list a circling approach as a test item. This shortcoming in the flight test form is being addressed in the course of a review of all flight test forms commenced several months ago. It is anticipated that a new instrument rating flight test form will be promulgated and distributed to industry early in 1997."

The Civil Aviation Safety Authority responded again on 13 January 1997 as follows:

"I refer to BASI draft Air Safety Occurrence Report 9600399 concerning the accident involving Piper PA31-350, VH-KIJ, near Moorabbin Victoria on 8 February 1996. The following comments are forwarded for your consideration.

"The Authority agrees with the recommendations contained in the subject draft ASOR. Also, in regards to IR960027:

"(1) AIP DAPS IAL 2 paragraph 1.5 has been amended, with effect 5 December 1996, to clarify the intent of the instruction. The revised text provides requirements for visual circling at night and by day.

"(2) The obstacle clearance heights required for visual circling are those included in the procedures of ICAO Doc 8168 OPS/611 Volume 1 which have been adopted by Australia. These procedures are accepted and are used world wide. The Civil Aviation Safety Authority considers that the minimum obstacle clearance heights specified in the PANS OPS procedures provide an appropriate safety margin for visual circling operations."

Classification of response: OPEN (The Bureau considers that the response does not meet some or all of the criteria for acceptability for a recommendation that the Bureau considers to be significant for safety. The Bureau will initiate further correspondence.)

The Bureau issued interim recommendation IR960054 to Airservices Australia on 27 August 1996 as follows:

"IR960054

"The Bureau of Air Safety Investigation recommends that Airservices Australia review the criteria used for the installation of AWIBs, taking into account the types of operations at the airport, the frequency of RPT operations, the geographic location and prevailing meteorological conditions."

Airservices Australia responded on 15 November 1996 as follows:

"Re: Occurrence 9600399 generating Interim Recommendation: IR960054

"The Bureau of Meteorology has been installing Automatic Weather Stations (AWS) at aerodromes around Australia for a number of years. AWS are now a vital component of the weather observation network and make a significant contribution to aviation weather products, in addition to other services provided by the Bureau.

"AWS transmit to both the Bureau and to Airservices Australia the basic elements of wind direction and speed, pressure (QNH), air temperature, dew point, relative humidity and ten minute rainfall. The AWS observations are distributed to Air Traffic Service units, and are also stored in the AIS/MET database. In essence, the AWS observations form part of the preflight and inflight information service and, as such, are available on request.

"At the 1994 consultative meeting, industry endorsed a Bureau proposal to make AWS information available via telephone; this being facilitated by means of a Bureau developed device (known as Aerodrome Weather Information Broadcast [AWIB]) connected to each AWS. Industry also endorsed a proposal to make the AWIB information available on navigation aids which were collocated with Bureau AWS.

"With respect to installation and priorities, industry endorsed the proposition that any installation to support telephone (Bureau) or navigation aid (Airservices) access would form part of the normal equipment (AWS and navigation aid) maintenance programmes of the respective organisations. This endorsement was based on the understanding of AWIB connection issues at that time. It is on this basis that the Bureau is progressively implementing a national AWIB installation programme, providing industry with access to the broadcast information via telephone. The Bureau is currently planning to introduce some 20 AWIB per year. However, this installation programme is rather flexible as it depends largely on Bureau Regional Office priorities as to when and where it is carried out. Funding of the Bureau's installations was an integral part of the proposal endorsed by industry.

"Airservices Australia's involvement with such facilities to date has been limited to:

"(a) permitting AWIB to be connected to the Mount Gambier VOR for the initial proof-of-concept trial;

"(b) the use of AWIB (connected to a local navigation aid) as a replacement for obsolete ATIS facilities at four other non towered locations; and

"(c) introducing AWIB at Canberra as an out-of-hours ATIS supplement which eliminates the need for costly ATC support of out-of-hours RAAF flights, while at the same time directly assists industry to meet Canberra's new Noise Abatement Procedures (ATIS ZULU retained on NDB, AWIB on VOR).

"The only criteria applied in the selection of these sites was that of cost benefit to Airservices. Each of these installations was progressed as an individual requirement and not as part of any programme.

"Whereas the Bureau's costs were not high, were readily defined and were therefore endorsed as a part of the proposal, Airservices is still in the process of identifying the cost of AWIB/navigation aid connection at other locations. It is intended that this costing information form part of a proposal to industry seeking funding for an installation programme. As you might appreciate, the cost of these connections varies considerably from site to site, and as they may involve several kilometres of new cabling work can be quite significant. Airservices' technical staff estimate the average cost of new cabling works at over $23,000 per kilometre.

"The other component of this Airservices proposal will be a prioritised installation schedule. The priorities are expected to be derived from work currently being undertaken by a group (chaired by the Bureau) which is determining a programme for AWS upgrades/enhancements. The remainder of this group is made up of representatives from Airservices, CASA, industry and the aerodrome owners. The criteria being used by the group specifically includes consideration of the rate of aerodrome utilisation by RPT and other IFR aircraft, critical weather locations and the availability of alternates.

"In the meantime, Airservices will continue to make AWS-derived observations available as part of the preflight and inflight information services."

Classification of Response: CLOSED - ACCEPTED