TRANSPORT ACCIDENT INVESTIGATION COMMISSION
TE KOMIHANA TIROTIRO AITUA WAKA

AIRCRAFT ACCIDENT REPORT

No. 92-011

Cessna 185C Skiplane and

Aerospatiale AS 350D helicopter

ZK-CVG and ZK-HEA

Fox Glacier Valley

27 June 1992

Transport Accident Investigation Commission
Wellington · New Zealand

Price $11.20 (including G.S.T.)

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AIRCRAFT: Cessna 185C Skiplane/ Aerospatiale AS 350D helicopter

REGISTRATION: ZK-CVG / ZK-HEA

PLACE OF ACCIDENT: Fox Glacier Valley

DATE AND TIME: 27 June 1992, 0916 hours

OPERATOR: Mount Cook Airline / Glacier Helicopters

PILOT: Mr C D Rowland / Mr S R Gibb

OTHER CREW: Nil / Nil

PASSENGERS: Nil / Six

SYNOPSIS:

The Transport Accident Investigation Commission was informed of the accident at 1000 hours on 27 June 1992. Mr J J Goddard was appointed Investigator In Charge and commenced the field investigation later that day. ZK-CVG was on a positioning flight from Mount Cook to Fox Glacier in order to conduct some scenic flights, while ZK-HEA was on a local scenic flight from Fox Glacier when a collision occurred. ZK-HEA was landed safely but ZK-CVG descended out of control to the riverbed. The pilot was killed in the ground impact.

1.1 HISTORY OF THE FLIGHTS: See page 3

1.2 INJURIES TO PERSONS: Pilot: ZK-CVG/ZK-HEA 1 Fatal/1 Serious; Pax: Nil/2 Minor, 4 Nil

1.3 DAMAGE TO AIRCRAFT: ZK-CVG Destroyed; ZK-HEA Substantial

1.4 OTHER DAMAGE: Nil

1.5 PERSONNEL INFORMATION:

Pilot in Command FLIGHT TIMES

ZK-CVG	LAST 90 DAYS	TOTAL
ALL TYPES	95	1256
ON TYPE	95	928

Pilot in Command FLIGHT TIMES

ZK-HEA	Last 90 days	Total
All Types	85	4398
On Type	85	700

1.6 AIRCRAFT INFORMATION: See page 5

1.7 METEOROLOGICAL INFORMATION: See page 6

1.8 AIDS TO NAVIGATION: Nil

1.9 COMMUNICATIONS: See page 6

1.10 AERODROME: Nil

1.11 FLIGHT RECORDERS: Nil

1.12 WRECKAGE AND IMPACT INFORMATION: See page 6

1.13 MEDICAL AND PATHOLOGICAL INFORMATION: Post mortem and toxicological investigations revealed no abnormalities which might have affected the pilot of ZK-CVG's ability to conduct the flight

1.14 FIRE: See 1.12, page 6

1.15 SURVIVAL ASPECTS: The accident was unsurvivable for the pilot of ZK-CVG

1.16 TESTS AND RESEARCH: See page 7

1.17 ADDITIONAL INFORMATION: See page 7

1.18 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES: Nil

2. ANALYSIS: See page 8

3. FINDINGS: See page 12

4. SAFETY RECOMMENDATIONS: See page 12

5. APPENDICES: See page 13

* All times in this report are NZST (UTC + 12 hours)

ABSTRACT

This report relates to the mid-air collision between Cessna 185C Skiplane ZK-CVG and Aerospatiale AS350D helicopter ZK-HEA in the Fox Glacier Valley on 27 June 1992 in which the pilot of the Cessna lost his life and the helicopter pilot was seriously injured. The safety issues discussed in the report are the harmonisation of flight paths and procedures of all operators who conduct scenic flights in the same general area, and the effectiveness of visual collision avoidance.

1. FACTUAL INFORMATION

1.1 History of the Flights

1.1.1 The pilot of ZK-CVG was based at Mount Cook. On 27 June 1992 his rostered duty required him to be available to operate from Fox Glacier, as the pilots based on the West Coast were on leave. On the previous evening he learned that a booking had been made for a scenic flight from Fox Glacier in the morning.

1.1.2 The aircraft departed from Mount Cook Aerodrome at 0859 hours for the ferry flight to Fox Glacier. The pilot had made routine RTF contact with Mount Cook Radio on 118.6 mHz, advising he was about to "roll for Fox". In reply he was advised of no traffic, and an altimeter setting of 1022.

1.1.3 Mount Cook Radio then contacted the Mount Cook Airline office in Fox Glacier by HF RTF, advising that ZK-CVG was airborne, with Mr Rowland as the pilot.

1.1.4 Some two minutes after take-off, Mount Cook Radio asked him for a report on the wind. He replied "A little bit rough in the Hooker, but acceptable". A few minutes later he made a position report, using his HF radio, which was "passing La Perouse, descending for Fox".

1.1.5 The only other radio call from ZK-CVG was heard by a helicopter pilot operating from Franz Josef. The call was on either 118.6 or 119.1 mHz, as both frequencies were monitored, and the time was not recorded. He heard "Fox Base, Victor Golf". This was repeated but without any reply.

1.1.6 The pilot of ZK-HEA was based at Franz Josef. Because a large tourist group of school students was expected for scenic flights it was arranged that he should ferry his helicopter to the Fox Glacier Helipad to fly some of the group. This was done, and six passengers were loaded for a routine 10 minute flight to the Fox Glacier.

1.1.7 ZK-HEA lifted off at about 0910 hours, and departed directly towards the Fox Valley, climbing at about 60 knots. The pilot made routine RTF calls on 119.1 mHz advising that he was airborne, and on entering the Fox Valley.

1.1.8 The helicopter was flown up the valley following the access road on the northern (left) side, in a continuous climb. After about 3 km, it was approaching and climbing above a shoulder on the mountain ridge on the valley side, where the pilot was able to see the brightly sunlit glacier face ahead. At this

point three of the passengers saw momentarily an unrecognised red and white object approaching rapidly just ahead of the helicopter. The pilot did not see it at all.

1.1.9 The right wing tip of ZK-CVG collided with the front of the fuselage of ZK-HEA, just above floor level, causing the right side doors to detach, and pushing the instrument pedestal back and disabling the pedal controls. The three front seat occupants received leg injuries from the wing intrusion.

1.1.10 After the collision, the pilot of ZK-HEA checked his cyclic and collective controls which seemed to function, but had no pedal control available. He decided to make an emergency run-on landing in the riverbed below, in a clear area with which he was familiar. He turned the helicopter right to position it for the area, warning his passengers to brace for the landing.

1.1.11 He made the approach with his collective control lowered as far as it would go, and attempted to shut off the engine fuel flow control lever as he flared the aircraft for landing. Touch-down was satisfactory, but the helicopter continued to slide on the frosty surface and swung right, skidding to the left at slow speed before coming to rest upright with the right skid partially collapsed. Engine shutdown was completed and the occupants evacuated the helicopter, the injured pilot being assisted by his passengers.

1.1.12 A second company helicopter on a similar flight landed alongside a few minutes later. The pilot reported the accident by RTF and evacuated the injured pilot and passengers to medical care.

1.1.13 After the collision, ZK-CVG descended in a near vertical spiral to collide with the riverbed. The impact resulted in an explosion and severe fire.

1.1.14 The accident occurred in daylight at 0916 hours at a position 4 km south-east of Fox Glacier township; the altitude was above 1800 feet amsl. National Grid reference 712602, NZMS 1 sheet S 71 "Waiho", latitude 43°29'S, longitude 170°02'E.

1.5 Personnel Information

1.5.1 Christopher David Rowland, 28, was pilot in command of ZK-CVG. He held Commercial Pilot Licence (Aeroplane) number 17927 which was valid until 4 May 1993. He also held an Instrument Rating. His logbook Type Rating Certificate was endorsed for groups A, C, G and Cessna 185 skiplane types.

1.5.2 He was medically examined for the renewal of his licence on 10 April 1992 and was assessed fit.

1.5.3 His total flying experience was 1255.9 hours of which 928.2 hours was on the Cessna 185 or 180 type.

1.5.4 During the previous 90 days he had flown for 95 hours, all on this type.

1.5.5 During the previous 7 days he had flown for 4.3 hours, all on this type. This flying comprised advanced training on 20 and 25 June, and one local flight on 26 June.

1.5.6 He was rostered off duty on 21, 22, and 23 June, but had been on sick

leave on 24 June because of toothache. On the afternoon of 26 June, he received dental treatment and was reported well thereafter.

1.5.7 He was employed as a skiplane pilot from November 1989. For some two years before that he had been employed at Mount Cook as flight clerk/ radio operator. He had operated from Fox Glacier on ten previous occasions.

1.5.8 His last flight check in accordance with Civil Aviation Regulation 76 was completed successfully on 31 October 1991.

1.5.9 Stephen Robert Gibb, 37, was pilot in command of ZK-HEA. He held Commercial Pilot Licences – Helicopter and Aeroplane, number 14284, valid to 14 December 1992. He held type ratings for Hughes 269, Robinson R22, Bell 206, Hiller FH1100 and AS 350 helicopter types. His licence was endorsed "spectacles (distance vision) must be worn".

1.5.10 He was medically examined for the renewal of his licences on 18 November 1991 and was assessed fit.

1.5.11 His total flying experience was 4398.25 hours, of which 1525.55 was on helicopters. His experience on the AS 350 type was approximately 700 hours.

1.5.12 During the previous 90 days he had flown 85.2 hours, all on ZK-HEA.

1.5.13 During the previous 7 days he had flown 4.6 hours.

1.5.14 He had been employed as a skiplane pilot from 1985 to 1989, based at Mount Cook for about one year, then based at Franz Josef. From November 1989 he was employed as a helicopter pilot, first based at Fox Glacier, then at Franz Josef.

1.5.15 His last flight check in accordance with Civil Aviation Regulation 76 was completed successfully on 10 December 1991.

1.6 Aircraft Information

1.6.1 Cessna 185C skiplane ZK-CVG, serial number 185-0681R had a non-terminating Certificate of Airworthiness in the standard category and a valid Maintenance Release. Maintenance documents recorded normal maintenance carried out in accordance with the Maintenance Manual.

1.6.2 Aerospatiale AS 350D helicopter ZK-HEA, serial number 1008 had a standard category Certificate of Airworthiness valid until 21 December 1994, and a valid Maintenance Release. Maintenance documents recorded normal maintenance carried out in accordance with the Maintenance Manual.

1.6.3 Each aircraft was loaded below the maximum permitted weight, and within the approved centre of gravity range.

1.6.4 ZK-CVG was painted white, with company colours on the fuselage and with large orange and red areas on the wings and tail.

1.6.5 ZK-HEA was painted dark maroon with a white cabin top and belly.

1.6.6 Each aircraft was equipped with one VHF and one HF radio transmitter.

1.7 Meteorological Information

1.7.1 An anticyclone in the Tasman Sea gave generally fine settled weather with a light south-west airflow over the area.

1.7.2 The Fox Glacier weather at 0800 hours was:
Wind: light and variable
Visibility: unlimited
Cloud: 1 octa stratocumulus 3000 to 5000 feet, over the coast
QNH: 1024 hPa

1.7.3 The weather at Mount Cook was fine and calm, with no cloud.

1.7.4 The pilot of the second company helicopter reported that the weather in the Fox Glacier Valley at the time was calm and clear.

1.9 Communications

1.9.1 The standard procedure for aircraft operating from Mount Cook Aerodrome, within the Mount Cook National Park, and within the Westland National Park above 6000 feet amsl was to make position reports by RTF on 118.6 mHz. Within Westland National Park below 6000 feet, and on the West Coast 119.1 mHz was used.

1.9.2 Reports of RTF calls from ZK-CVG at Mount Cook indicated normal communications on 118.6 mHz. His subsequent unanswered call, which was heard at Franz Josef, was on either 118.6 or 119.1 mHz.

1.9.3 The Mt Cook Airline office at Fox Glacier, to which this unanswered call was addressed, used 119.1 mHz for VHF communications. The radio was not permanently manned, and VHF reception was limited by high terrain.

1.9.4 The pilot of ZK-HEA reported normal communications on 119.1 mHz. His flight would not have required him to change to 118.6 mHz as it was to be below 6000 feet.

1.12 Wreckage and Impact Information

1.12.1 The ground marks and disposition of the wreckage of ZK-CVG indicated that it was in a near-vertical nose down attitude on a heading of about 060°M when it collided with the riverbed. The separated engine and propeller was embedded in a crater in the frozen silt surface, while most of the fuselage and wings had been consumed by fire.

1.12.2 The outer 1.5 m of the right wing was missing, but the rest of the aircraft structure had been present at ground impact.

1.12.3 Because of fire and impact damage, little evidence was available to determine control positions or systems and structural integrity. The radio frequency tuned on the aircraft's radio could not be determined. The elevator trim was in a mid-forward position, and the skis were retracted.

1.12.4 ZK-HEA was sitting upright on a heading of 023°M after yawing right during a landing slide on a westerly heading. The right skid and ventral fin were damaged during the landing. The rotors were undamaged.

1.12.5 Most of the lower nose section of the cabin between the floor and the windscreens was missing, as were the two right doors. The outer 1.5 m right wing

section of ZK-CVG was wedged horizontally in the front of the cabin, immobilizing and fracturing the pedal controls. The instrument pedestal was pushed rearward, and the floor attachments of both front seats were broken. The cyclic control was apparently undamaged but the collective control downward movement was limited by the displaced pedestal. The fuel flow control lever was also broken and obstructed by the pedestal.

1.12.6 Other structural damage included buckled cantilever floor beams and distortion of the rear cabin wall and engine bay structure. The dynamic components of the helicopter were apparently undamaged.

1.12.7 The nearly symmetrical damage to the nose of the helicopter, and the crush pattern of the embedded wing section suggested that the collision had occurred with the two aircraft approximately head-on, rather than converging at an appreciable angle. The angle of the wing entry, parallel to the floor of the helicopter, suggested that both aircraft were in similar bank attitudes at the time.

1.12.8 Miscellaneous pieces of debris, which included the two doors from ZK-HEA and the right wing tip fairing from ZK-CVG were located but not recovered. They were at 1800 feet amsl on the 65° slope of a ridge to the east of the Cessna wreckage.

1.16 Tests and Research

1.16.1 A reconnaissance flight by helicopter was made two days after the accident, at the same time of day and in similar clear conditions. The purpose was to establish the extent of the shadowed area in the valley from the high terrain to the north-east.

1.16.2 The height of the shadow above the accident site varied because of the shape of the skyline, but was found to be not below 3300 feet amsl at that time.

1.16.3 The difference in illumination between the brightly sunlit snow surface of the glacier 5 km up the valley and the deep shadow of the lower valley was not measured but was markedly apparent to the eye.

1.17 Additional Information

1.17.1 Photographs taken by passengers in ZK-HEA on the accident flight confirmed the calm clear cloudless weather conditions and showed that the helicopter's forward windscreen was clean and presented no obstructions to vision other than the central mullion.

1.17.2 The pattern of flightpaths up and down valleys used by skiplane pilots on local scenic flights at Mount Cook had been established by practice since skiplane operations started there in the 1950's. They generally involved flying up and down the right sides of the valleys, in a left-hand circuit, and conformed well with the predominant location of updraughts and downdraughts in the prevailing westerly airflow. Pilots were trained to follow the pattern, but it was not documented in the Company Flight Operations Manual.

1.17.3 When skiplane operations commenced at Fox Glacier and Franz Josef Aerodromes in the 1960's a similar left hand circuit pattern, keeping to the right sides of valleys, was followed in the same way.

1.17.4 By 1986, following deregulation of the air transport industry, a number of helicopter operators were based on the West Coast, offering scenic

flights to the glaciers with landings on the snow. Because the increased amount of traffic was creating a noise problem the Department of Lands and Survey, who administered Westland National Park, coordinated a meeting of local operators so that noise abatement procedures and hence flightpaths in the Fox and Franz Josef Valleys could be agreed and promulgated. Present at this meeting, in addition to the local helicopter operators, was a Mount Cook Airline skiplane pilot normally based at Mount Cook, and probably the pilot based at Franz Josef. A representative of the Civil Aviation Division of the Ministry of Transport was also present.

1.17.5 Flight paths agreed upon and promulgated to the West Coast operators involved a left hand circuit in the Franz Josef Valley and a right hand circuit in the Fox Valley. Diagrams prepared at this time confirmed this flightpath in the Fox Valley as climbing up the valley on the northern side, then descending on the southern side.

1.17.6 These flightpaths were specifically described as "rotary wing flightpaths" in the written information promulgated, but some of the West Coast based skiplane pilots also had been aware of and conformed with them where relevant.

1.17.7 These flightpaths were included in helicopter operators' Flight Operations Manuals.

1.17.8 After the accident discussions with Mount Cook Airline operational management and training personnel established that they expected their pilots to keep to the right sides of valleys throughout their operation. They were not aware of the agreed procedure of West Coast helicopter operators to fly on the left sides of the Fox Valley, nor were they aware that some of their West Coast based skiplane pilots had known of and conformed with the helicopter procedure. They had not been involved with the 1986 meeting.

1.17.9 After the accident, the Department of Conservation, who suceeded the Department of Lands and Survey in administering Westland National Park, were unable to find from their records either the list of participants to the October 1986 meeting or a copy of the post-meeting letter to Mount Cook Airline. They stated, however, that this letter went to all the participants. The letter outlined the circuits in the Franz Josef and Fox Valleys, and included sketch maps showing the flight paths.

1.17.10 Mr Gibb, the pilot of ZK-HEA, when employed by Mount Cook Airlines as a skiplane pilot at Franz Josef, had the letter and maps pinned to the wall of the Mount Cook Airline office.

1.17.11 At the time of the accident, ZK-CVG and ZK-HEA were the only aircraft flying in the Fox Valley.

2. ANALYSIS

2.1 This collision occurred between two aircraft flying in accordance with Visual Flight Rules, in conditions of excellent visibility and no cloud. There were no known impediments to the visual ability of either pilot. The evidence showed that the collision was approximately head-on, so that the other aircraft

should have appeared in each pilot's main field of vision ahead of him. There was no other traffic in the vicinity.

2.2 The helicopter pilot stated that he did not see the skiplane at all. While there were no ground witnesses, the helicopter passengers who briefly saw the skiplane before the collision did not see any obvious manoeuvre. It was evident that the pilot of ZK-CVG did not see the helicopter in time to avoid the collision; it was possible that he did not see it at all.

2.3 The closing speed of the aircraft was probably about 200 knots, as the helicopter was being flown at 60 knots and a likely speed for the skiplane on a rapid descent with no passengers was 130 to 150 knots. This equates to a rate of closure of about 100 metres per second. The time for a pilot to spot traffic, identify it, realise it as a collision threat, react and have the aircraft respond has been demonstrated to be a minimum of 10 seconds. This suggests that either pilot would have had to spot the other aircraft at a minimum distance of 1 km to be able to avoid this collision.

2.4 In normal circumstances, with clear visibility, a pilot should be able to detect visually a light aircraft or helicopter which is head-on but not moving across his field of view at a distance of about 5 km, and to recognize it at about 1100 m. This does depend on his acquiring the target in his central vision where visual acuity is greatest. Visual acquisition in turn depends on the pilot performing a visual scan so that his central vision may take in the area of potential conflict ahead and to each side of him.

2.5 Because of this, it might be assumed that the pilots involved in this accident should have had a reasonable opportunity to see the other aircraft in time to take some avoidance action. However, in spite of the clear visibility, the helicopter was flying in deep shadow in the lower valley with the pilot principally looking towards the brightly sunlit snow ahead on the glacier and surrounding mountains. Because of the climbing and descending flightpaths the skiplane was probably in front of this bright white background, from his viewpoint, which would have made it hard to see. The skiplane's landing light would also not be prominent against such a background. While it was not established if this was switched on, it was normal practice to do so.

2.6 Similarly, the helicopter would have been a dark object against a dark background from the skiplane pilot's position as the helicopter's dark maroon colour would have had little contrast with the dark valley, and thus been difficult to distinguish. The skiplane pilot would have left the bright sunlight above and descended below the shadow line less than a minute before the collision. His eyes may not have had time to adapt to the markedly lower illumination and thus have reduced further his ability to spot the helicopter. The red ventral rotating beacon on the helicopter probably would not have been visible from in front and slightly above. It was not a high intensity strobe light and not prominent in daylight.

2.7 Another possible reduction in each pilots' ability to see the other aircraft may have resulted from the flightpaths in relation to the shoulder on the ridge protruding from the valley side. The collision occurred above the ridge as evidenced by the debris located on it, and by the helicopter pilot's account. While the skiplane's flightpath and descent profile approaching the ridge was not established, it was possible that terrain masking had occurred for some part of the approach, reducing the opportunity for either pilot to see his traffic.

2.8 It could not be established if the flightpath of either aircraft had been in contravention of Civil Aviation Regulation 38, which required a minimum height of 500 feet above any point within a 2000 foot radius below the aircraft, because the height of the collision above the debris was not known. It is common practice, however, for pilots flying in such valleys to fly closer to the side than compliance with this Regulation permits. While this is done for positive flight safety reasons such as to optimize turning space in the valley, or to avoid downdraughts, it can compromise pilots' ability to see conflicting traffic if their flightpaths are on opposite sides of protruding terrain or if the valley ahead is not straight.

2.9 One of the ways used on frequently travelled routes to aid pilots' anticipation and sighting of other traffic is a system of broadcasting position reports by RTF. In the case of Fox Glacier traffic such a system existed, but it involved two different radio frequencies, for use above and below 6000 feet. The use of different frequencies had been developed because of congestion of radio traffic at busy times. The helicopter radio was therefore tuned to 119.1 mHz, which would have been used for the whole flight below 6000 feet, while the skiplane radio was tuned to 118.6 mHz during the flight from Mount Cook, and should have been retuned to 119.1 mHz during the descent through 6000 feet.

2.10 Whether the pilot had changed frequency to 119.1 mHz was not established, but this may have had little effect on events, in the particular circumstances of this accident. This was because the time from the skiplane's descent through 6000 feet, with the presumed change of radio frequency, to the collision was probably less than two minutes. The helicopter pilot's last call, entering the Fox Valley, was probably made rather more than two minutes before the collision, when the skiplane was on the other frequency and thus unable to receive it. The next normal call for the skiplane pilot to make was passing Cone Rock, just past the accident site, and was probably not made before the collision occurred. No position report had been heard from the skiplane after the pilot could have been expected to change to 119.1 mHz, but intervening high terrain may have blocked its VHF signal from West Coast ground stations, or from ZK-HEA. The unanswered call to Fox Base may well have been on 119.1 mHz, but its time in the sequence was not established.

2.11 After the accident a meeting of local operators resulted in a number of extra reporting points being established, and the radio frequency to be used below 6000 feet was changed to 118.6 mHz so that aircraft were not on different frequencies in the same area. This was promulgated by NOTAM, by the Air Transport Division of Ministry of Transport on 31 July 1992.

2.12 Another way to assist an orderly flow of traffic in a confined area such as the Fox Glacier Valley, with occasionally significant amounts of traffic, is to have flightpath procedures which channel aircraft to the same side of the valley according to their direction of flight. This has the advantage that aircraft in close proximity are travelling in the same direction, so closing speeds are low and visual separation has a better chance of being effective. It also means that aircraft will not generally conflict anyway, unless one is overtaking or outclimbing another. This contrasts with an opposite-direction situation, where a confliction is likely to occur whenever two or more aircraft fly up and down the valley at similar heights.

2.13 Such a flightpath procedure had existed for the Fox Valley; it had been carried over from the skiplane operations at Mount Cook, and involved aircraft keeping to the right side of the valley, flying a left-hand circuit. In 1986, however, the meeting of local (helicopter) operators, coordinated by the Department of Lands and Survey, adopted a differing pattern whereby helicopters would fly a right-hand circuit in the Fox Glacier Valley.

2.14 This revised Fox Glacier procedure should have been known to Mount Cook Airline operational management personnel at Mount Cook, because of the attendance at the 1986 meeting of the Mount Cook skiplane pilot or pilots. After the accident, however, it was found that current Mount Cook operational management and training personnel were not aware of it, with the result that their pilots were trained to follow the same procedure throughout the skiplane operating area. This was notwithstanding that some of their West Coast based pilots had known of and complied with the revised Fox Glacier procedure.

2.15 A possible reason for the Mount Cook Airline management personnel's lack of knowledge of the revised procedure was the method of promulgation of information after the 1986 meeting. The Department of Lands and Survey, as licensor of operators landing within the Westland National Park, undertook to do this. They sent letters to the licensees, probably including the West Coast based Mount Cook Airline skiplane pilots, but not to the Operations Manager at Mount Cook. No wider promulgation was made by the Air Transport Division of Ministry of Transport, even though a representative was present at the 1986 meeting.

2.16 It did appear, however, that some shortfall in communication between the Mount Cook Airline West Coast based pilots and their operational management at Mount Cook may have played a part in this lack of knowledge of an important operational procedure.

2.17 The promulgated flight paths were essentially of an advisory nature in an area where no Air Traffic Control procedures applied, and aircraft were basically regulated by the Rules of the Air. They were a reasonable development in view of increasing locally based traffic, but did need to be better advertised and implemented. The ATD representative had monitored their formation and promulgation and, in view of their non-regulatory nature, had not taken further action. If ATD had published the information by NOTAM or CAIC, the subsequent incomplete knowledge might have been averted.

2.18 The two pilots involved in this accident were each conducting their flights in accordance with their training and their established company procedures. These procedures resulted in the head-on confliction which they were unable to avert.

2.19 This accident demonstrates that visual collision avoidance is a fallible resource, even between aircraft of moderate speed. In order to maintain an acceptable level of risk in VFR operations, aircraft need to be operated in low traffic density, and where constrained by any topographical or airspace feature, need to follow orderly procedures so that any conflictions are few but manageable; so that visual separation may be established and maintained without the need for visual collision avoidance.

3. FINDINGS

3.1 Both pilots were appropriately licensed and experienced for the flights.

3.2 Both aircraft were maintained properly and had valid Certificates of Airworthiness.

3.3 Both aircraft were properly loaded.

3.4 The aircraft collided approximately head-on, while the helicopter was climbing and the skiplane was descending.

3.5 Neither pilot saw the other aircraft in time to avoid the collision.

3.6 The visibility was good, but shadow conditions in the valley made each aircraft more difficult to detect visually.

3.7 The aircraft may have been masked from each other for a period by terrain, because each of their flightpaths was close to the side of the valley.

3.8 The radio procedures in use may have caused each pilot's position reports to be segregated on different frequencies.

3.9 The routes followed by each pilot were in accordance with their established company procedures.

3.10 These routes were in direct confliction in the Fox Valley.

3.11 This mid-air collision occurred because neither pilot saw the other aircraft in time to take effective avoiding action. Contributing factors were the shadowed lighting in the valley; the radio procedures in use and the limited effectiveness of visual collision avoidance in a head-on situation.

3.12 A causal factor was the difference in routes which produced a direct confliction in the Fox Valley.

4. SAFETY RECOMMENDATION

4.1 It was recommended to the Director of Civil Aviation Safety that he:

Ensure that the flight paths and procedures of all operators who commonly conduct scenic flights in this area were harmonised without delay (030/92).

4.2 NOTAM A 0838/92, issued on 7 July 1992 included:

"B. Fox Valley Ops: 2. Enter and climb on the south side of valley, descend and vacate on the north side of valley."

9 August 1993

M F Dunphy
Chief Commissioner