ACCIDENTS BRANCH

INVESTIGATOR'S REPORT

1. Type and Marking of Aircraft ..MUSTANG 9555.....

2. Type and Number of Engines ..MERLIN V1650-7...#328460.....

.....

.....

3. Type of Airscrews ..4 BLADE HYDROMATIC.....

4. Unit ..FIS TRENTON, ONTARIO.....

5. Date and Time of Accident ..1325 HRS 10 JUN.....

6. Date and Time of Notification ..1900 HRS 10 JUN.....

7. Date of Visiting Accident ..1000 HRS 12 JUN.....

8. Location of Accident LAKE ONTARIO, 1 mile ENE of Pt. Traverse, Prince Edward County, Ontario.....

9. Object of Flight ..ALTITUDE CLIMB.....

10. Weather Conditions ..THUNDER STORM ACTIVITY BUT CLEAR IN AREA WHERE FLIGHT WAS CONDUCTED.....

11. Crew

Duty	Name	Injuries	Flying Time Dual	Flying Time Solo	Flying Time Link
Pilot	F/O B.A. Newman	Fatal	199:25	863:05	45:30

TIME ON MUSTANG AIRCRAFT Aug 1951 - 1:50
May 1952 - 2:15
4:05

12. Passengers

Name	Injuries	Name	Injuries

NIL

13. Interference with Wreckage WRECKAGE LOCATED IN 110 FEET OF WATER SECTIONS ONLY WERE SALVAGED.

14. Date and Time of Inquest BODY NOT RECOVERED.

15. Command Investigation YES AND AIB

16 Engine and Airframe History

A perusal of the engine and airframe log books, apart from the entries on oxygen, do not appear to have any bearing on this accident and for that reason have not been included in this report. Although special inspection EO 20-115DA - 5/1 and EO 20-115CB - 5/1 were carried out, the blinker and associate line were not removed in accordance with the instructions contained in EO 20-115CB - 5/1.

17 Refueling

Main wing fuel tanks contained a total of 150 gallons, there was no fuel in the fuselage tank.

18 Loading

19 History of the Pilot

F/O Newman commenced training at Centralia, Jan 9, 1950. By September of the same year he had completed his course and took the AAS at Trenton. From here he was posted to 412(T) Squadron in December 1950. In March 1951 F/O Newman took an instructors course at Trenton and following the course was retained as an instructor. In October 1951 he was posted to Claresholm, Alta where he instructed until May of 1952 when he was posted to the AFS at Trenton.

20 Narrative Report on Accident to Mustang 9555

The pilot had a total of 1,000 hours, of this, one hour 50 minutes was obtained in August and September 1951 on a Mustang aircraft. In May of this year he received a further 2 hours 15 minutes, consisting of Mustang exercise 1 and 2, cards of which are attached. Exercise 3 was to consist of a climb to 30,000 feet, noting various settings, stalls, steep turns, aerobatics and compressibility dive was to be at a speed of approximately mach .75 to obtain the feel of the aircraft when reaching compressibility. It will be noted that the speed quoted on Mustang exercise card No. 3, differs with those quoted in Pilot Operating Instructions (EO 05-35C-1) part IV, page 35, para 4, Flying Limitations. According to card No. 3, the speed between 30,000 and 25,000 feet read 365 mph, while the speed quoted in the above publication is not to exceed 325 mph. This matter was discussed with the Flight Commander and he stated that the pilots were briefed to reach a speed of 365 mph at 25,000 feet. Although this seems reasonable, the two sets of figures are not the same and it would appear that the figures quoted on card No. 3 should be set up so as to correspond with those in the Engineering Order.

...../3

F/O Newman did not receive the four hour indoctrination course which is part of the syllabus given by W/C Powell at Station Trenton, which was also to include a decompression chamber run. The Flight Commander did not know whether Newman had an indoctrination course at IAM when he went through as a Flight Cadet. The Deputy Flight Commander, however, gave him a briefing on the use of the oxygen equipment and told him various checks, such as blue finger nails, placing the mask up to his eyes to see if he could feel the oxygen being discharged from the mask, but he did not brief him on the fact that some oxygen blinker systems were made inoperative due to the type of regulator installed in the aircraft. The reason for this is outlined in Special Inspection EO 20-115CB - 5/1 (attached). Further to the briefing by the Deputy Flight Commander, it appears that Newman was told to put the oxygen regulator control to normal position and to leave it there. EO 05-55C-1, Part I, Page 11, Para 73, Operations Oxygen Systems General, outlines the operation of the oxygen regulator and indicates that if sufficient oxygen is available, 100% should be used above 20,000 feet. The pilot was airborne approximately 25 minutes, and according to the Flight Commander, it would have taken him approximately 1 hour to have reached stage 7, as outlined on exercise card No. 3. This means that when considering this exercise, he would be at approximately stage 5 of the exercise card and would be doing his steep turns, both left and right. Ground witnesses saw condensation trails in large circles with the aircraft turning both left and right. This would indicate that he was at approximately stage 5 of his exercise. On one of these circles, a sharp kink was noted in the condensation trail and the witnesses stated that the aircraft was seen to descend, revolving slowly about its longitude axis during this descent. From their description of this turning manoeuvre, I would say that the aircraft was spiraling not spinning; not only that, their explanation of the noise increasing in intensity, would also indicate that it was a spiral type uncontrolled manoeuvre. From the angle indicated by the witnesses, I would estimate that at approximately 2,000 to 3,000 feet, the aircraft was momentarily righted and attempted pull out was made. At this point, a wing and a black object, which could have been a fuel tank, was seen to leave the aircraft. All witnesses state there was an explosion at this point; some say there was a flash of metal particles, others say a dust cloud and one states there was evidence of brown smoke. It is considered that the explosive noise was just the act of metal tearing apart when an apparent recovery action was taken. After striking the water the aircraft remained floating for approximately 30 seconds. Fishermen proceeded immediately to the scene and after locating the oil slick, marked the east and west extremities of it with buoys. The following day, the 6RD salvage party located the main wreckage with the aid of an electronic device and attempted to raise the wreckage by the use of grappling irons. During this process, sections of the body (pilot's) came floating to the surface. As they were afraid of losing these sections of body if further operations continued, they contacted 6RD to advise them of the situation and suggested that a diver should be used. The diver, tug and barge were dispatched to the scene and the diver, operating in 105 feet of water with negative visibility, located the body by feel. The body was secured by the parachute harness and hoisted to the surface, but before it could be lifted on to the tug, it slipped from the harness and sank beneath the surface. Further attempts to locate the body were dispensed with. The diver was sent down and four other attempts were made to hoist the wreckage, but due to the break-up of the fuselage and the muddy

..../4

bottom of the lake, they were unsuccessful. S/L Quinn of 6RD advised by telephone at 2200 hours 14 Jun 52, that operations would continue and when the wreckage was available at 6RD for inspection, W/C Milne would be advised.

During salvage operations, a contact was made approximately one-half mile east of the main wreckage. This, I believe is either the wing or tail section of the aircraft. When I say, tail section - a lighthouse keeper stated that he saw the tail section break off the aircraft approximately half-way through the descent. In questioning the lighthouse keeper, he said that he saw the smoke trails and obtained a pair of binoculars to watch them more closely. He saw the aircraft descend in a spiral type manoeuvre and half-way down saw the tail section come off the aircraft. I examined his glasses and would say that they are approximately 2X. He may be right in stating that the tail came off, but four other witnesses, who were only one and one-half miles from the scene, had a much better chance of stating what sections of the aircraft came off. The lighthouse keeper was approximately three and one-half miles from the scene of the accident. It would appear from the witnesses description of the accident and the time at which the aircraft was airborne, that the pilot was at stage 5 on the exercise card and, therefore, was doing steep turns. From their explanation of the type of descent made, it would appear that the only reasonable explanation for this uncontrolled manoeuvre is either lack of oxygen or loss of control while doing steep turns. With 1,000 hours experience and highly rated by his instructors, it seems hardly possible that the pilot would lose control. Not only that, on exercises 1 and 2, spins were carried out, therefore, it is felt that his knowledge of recovery would have precluded any chance of loss of control.

On checking the LL4, it was noted that this aircraft had not flown from the 4th to the 10th of June. In other words, this was a first flight following a test flight after a periodic. On questioning LAC Weimer with reference to Special Inspection 20-115DA-5/1, it was learned that he did not use an A13A oxygen mask on each subsequent daily inspection following this special inspection which was made on type A12 regulators in Mustang aircraft (see Special Inspection attached).

During investigation it was noted that the blinker system, an associated line, was not removed from the regulator but remained in the aircraft. The situation of Mustang aircraft at Trenton is this: some blinker systems are inoperative while other blinker systems operate normally. It would be difficult for a pilot to check the serviceability of his blinker and regulator under the above conditions. Pilots were questioned with reference to these arrangements and it was learned that they were not aware that such a modification had been carried out. Para 6(a) and (b) under Additional Data EO20-115CB-5/1 was not made available to some pilots at Trenton.

EO 05-1-1 (Pilot's Operating Instructions General) and the revision on Oxygen, Part I, Chapter 3 revised 19 Jun 52, were not available in D flight at the advanced Flying Instruction School at Trenton. The Flight Commander had not checked to see if his students had been previously issued with these publications and they were not part of the publications issued while on the advanced instructors course. It was also noticed during the investigation, reference exercise card No. 3 attached, that 46 inches of boost was used for take-off on this particular exercise, to note difference in take-off run. This is contrary to AFRO 363/51 which states that 61" boost is to be used.

...../5

21 Examination of the Wreckage

The wreckage was examined at 6RD. It consisted of the starboard wing sections of fuselage and the propeller. The starboard wing was intact. There was very little damage to the wing surface apart from the bulged root end. This was blown out by the force of the water impact. Approximately one foot of the port wing skin remained attached to the lower surface of the starboard wing surface. It was impossible to tell how the port wing broke free from the aircraft prior to impact with the surface of the water. The aileron was intact but the trim tab was broken, and a section was missing. When examined the flap was detached from the starboard wing but it is believed this occurred during salvage operations. Although the starboard wing was detached from the fuselage when examined at 6RD it was attached when it was salvaged from the bottom of Lake Ontario.

The port wing was missing and from the evidence of the fairing attached to the wing and still attached to the fuselage the port wing left the fuselage before it struck the surface of the water. The fairing had been driven against the H type frame with terrific force. The imprint of the rivets and the moulding of the fairing in and around the H type frame is positive proof that the port wing was not on the aircraft.

The fuel tank in the starboard wing was missing, it is considered that when the root end was exploded by the force of the water the fuel tank became detached at that time.

The fuselage rear section from station 232 complete with the stabilizer elevators fin and rudder was not located. It was impossible to tell how this section became detached or whether it occurred before or after water impact.

The starboard section or side of the fuselage from the fire wall aft to approximately station 232 was more or less intact. There was no trace of the canopy or canopy rails. The forward truck assemblies were missing which the rear one was intact and in the locked position. Two sections of oxygen breathing equipment were located but no cockpit instruments were located. The oxygen regulator, blinker or oxygen contents gauge were not located.

The propeller was damaged very little. During salvage operations it became detached from the engine. Apart from the after-cooler the engine is still at the bottom of the lake.

A small section of the port side of the cockpit was located. This contained only the throttle quadrant and undercarriage control handle.

Due to the fact that it was impossible to salvage a large part of the aircraft, valuable evidence was missing. It was impossible from the sections that were salvaged to ascertain the direct cause of the accident. However, from the evidence compiled it would appear that anoxia is the most probable cause.

...../6

22 Findings

(a) Information contained in paras 6(a) and (b) of Special Inspection EO 20-115CB-5/1 was not made available to all pilots at the Advanced Instructors School at Trenton.

(b) Information contained in Special Inspection EO 20-115DA-5/1 was not made available to all pilots at the above mentioned school. Although this check is to be made on daily inspections, it should also be made by pilots prior to each take-off when flights are to be made at an altitude where oxygen is to be used, thus it should be an in-between flight inspection by all pilots to ensure that the oxygen system was operating properly.

(c) 46 inches of boost used for take-off, reference exercise card 3, is a direct contravention of the present Order which states 61 inches boost should be used at all times during take-off with Mustang aircraft. AFRO 363/51.

(d) Airspeeds indicated on exercise card No. 3, section 7, are not represented in the same manner as those contained in Pilot's Operating Instructions for Mustang aircraft (see exercise card No.3 and Part 4, page 35 EO 05-35C-1).

(e) EO 05-1-1 and revision on Oxygen, Part I, Chapter 3 (Some Practical Aspects of Human Limitations) was not available in D Flight of the Advanced Training School at Trenton. This Engineering Order and the revision was not issued to student pilots on that course.

23 Recommendations

(a) The data available under EO 20-115CB-5/1 and EO 20-115DA-5/1 and pertinent information contained in these Orders should be made available to pilots and be included in Flight and Section Pilot Orders.

(b) That boost pressures (AFRO 363 dated 15 Jun 51) be made mandatory (reference exercise card 3, section 1, where 46 inch boost is being used.

(c) Airspeeds under section 7 of exercise card 3 (compressibility dive) should be set up to read the same as those contained in EO 05-5501, part 4, page 35 and should be quoted in knots.

(d) That the system of distribution of the Revision of Oxygen (EO 05-1-1 part 1 chapter 3) and the oxygen indoctrination, be reviewed with a view to establishing a more fool-proof system than is presently in use.

...../7

(e) That compressibility dives boarding on Mach .75 be discontinued in Mustang aircraft.

B.C. Hartman S/L

Attach.

(B.C. Hartman) S/L
Inspector of Accidents.

97/12

M E M O R A N D U M

File No: 093-9555(CIA)
Ottawa, 2 Jul 52

AMTS/DMS

Flying Accident - Mustang 9555
1 Mile ENE Pt. Traverse, Ont., - 10 Jun 52

1 During the investigation of this fatal accident, a serious situation was discovered with reference to the oxygen systems installed in Mustang aircraft.

2 AMC issued instructions, reference their signal T2278 dated 13 Sep 51, that until regulators of the correct manufacture were obtained, the blinker system was to be removed in order that the A13A oxygen mask could be used. This signal and the subsequent EO 20-115CB-5/1, a copy of which is attached, outlines this procedure and states that the blinker and line are to be removed.

3 Mustang aircraft at RCAF Station Trenton, were not modified in accordance with instructions outlined above, in that the blinker was rendered inoperative but the blinker and line were not removed. Some aircraft had the correct regulator installed and the blinker operated normally with the A13A mask. It is therefore possible that, should the instructions to the pilot not cover specifically the fact that the blinker system had been isolated in a particular aircraft, he could become confused in attempting to differentiate between the following cases:

(a) Blinker system isolated but system serviceable.

(b) Blinker system operating and system serviceable.

(c) Blinker system isolated but system unserviceable.

(d) Blinker system operating and system unserviceable.

4 All commands using Mustang aircraft have been advised by signal ref CIA 165, dated 2 Jul 52 of the procedure that should be used by pilots to test Bendix type oxygen regulators fitted to this type of aircraft.

...../2

5 It is requested that immediate action be taken to ensure that all blinkers fitted in Mustang aircraft presently on the strength of RCAF Station Trenton, Ontario, be removed in accordance with the existing instructions. It is also requested that a check be made on all other user units to see that the situation outlined in paras 2 and 3 above does not exist.

Attach.

(R.F. Milne) W/C
for CIA

C
O
P
Y

FM CANAIRTRAIN

TO ZEN/RCAF STN TRENTON ETC.

GRNC

T1407 19 MAY SPECIAL INSPECTION. INSTANCES HAVE OCCURRED WHERE A NUMBER OF DILUTER DEMAND OXYGEN REGULATORS TYPE A-12 MANUFACTURED BY ARO EQUIPMENT CORPORATION HAVE BEEN FOUND DEFECTIVE. THE RUBBER VALVE BETWEEN THE FIRST AND SECOND STAGE HAD SEIZED IN THE CLOSED POSITION AND SO PREVENTED ANY OXYGEN FROM FLOWING. BEFORE THE NEXT FLIGHT AND ON EACH SUBSEQUENT DAILY INSPECTION THE FOLLOWING TEST IS TO BE MADE ON TYPE A-12 REGULATORS. CONNECT AN A-13A MASK TO REGULATOR. SET AIR DILUTER VALVE TO 100 % OXYGEN. IF THE VALVE IS SEIZED INHALATION IS EXTREMELY DIFFICULT AND THE BLINKER WILL NOT FUNCTION.

UNDER THIS CONDITION NO OXYGEN WILL BE DELIVERED BY THE REGULATOR. WITH THE AIR DILUTER VALVE SET AT NORMAL, INHALATION WILL BE NORMAL BUT ONLY AIR WILL BE INHALED AND THE FAULT WILL NOT BE DETECTED. DEFECTIVE REGULATORS ARE TO BE REPLACED AND REPORTED BY MESSAGE TO TCHQ.

THIS INSPECTION ALLOTTED EO NUMBER 20-115DA - 5/1. L 14 TO BE ANNOTATED ACCORDINGLY. FOR CANAIRPEG ALL WESTERN UNITS NOTIFIED.

C
O
P
Y

DMS CIRCULAR ORDER NO.

Medical Officers Responsibility for the Instruction and Certification of Aircrew in the Use of Oxygen.

1 Medical Officers who are certified as "qualified" by the School of Aviation Medicine are responsible for the training of aircrew in the use of oxygen. Training will be divided into two courses. The first will consist of instruction and certification for equipment used up to 35,000 ft., and the second will cover equipment used above 35,000 ft. The two courses need not necessarily run consecutively.

2 The initial course will consist of lectures on the physiology and a demonstration of the following equipment: constant flow, economizer, demand-valve, portable and bail-out. In all cases, instruction will include:

(a) the use by aircrew of an oxygen assembly in a decompression chamber;

(b) a demonstration of aircraft installations, as available.

3 The second stage of training will consist of a lecture on the physiology and equipment used during high altitude flying (above 35,000 ft.) All trainees are to hyperventilate at ground level to the point of subjective symptoms, and all must be taken, suitably equipped, (and for not more than five minutes), to a simulated altitude of 42,000 ft., in the decompression chamber.

4 Medical Officers will record the results of the course of instruction on one line of Table 1, form RCAF M10, Medical Envelope, signed by the M.D. as "Qualified Oxygen up to 35,000 ft." for the initial course and "Qualified over 35,000 ft." for the second course. In the case of personnel who do not qualify, the reason should be briefly stated as "Alkalosis", "Respiratory Fatigue", etc.

5 Medical Officers are responsible for advising the C.O. of the certification or non-certification of aircrew.

- -

This order is to be brought to the attention of Commanding Officers and Officers Commanding who will be certifying Aircrew Log Books for high altitude flying as per CAP 100, Part 1, Chapter 11, Para 169.