

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted December 24, 1946

Released: January 6, 1947

UNITED AIR LINES, ELK MOUNTAIN, WYOMING - January 31, 1946

The Accident

United Air Lines' Flight 14 en route from Boise, Idaho, to Denver, Colorado, crashed near the top of Elk Mountain, Wyoming, at 0247³⁰ January 31, 1946. All 21 occupants of the aircraft were fatally injured and the Douglas DC-3 was demolished by impact and fire.

History of the Flight

Flight 14 departed Portland, Oregon, at 2020 January 30, 1946, with stops scheduled at Pendleton, Oregon, and Boise, Idaho. After being serviced at Boise, the aircraft departed at 0007 January 31, 1946, to cruise nonstop to Denver, Colorado. The original flight plan authorized prior to departure from Boise specified a cruising altitude of 9,000 feet between Boise and Malad City, Idaho, 11,000 feet between Malad City and Rock Springs, and 13,000 feet between Rock Springs and Denver. Until the aircraft arrived over Rock Springs, the flight was conducted without any apparent difficulty. However, as the flight approached Rock Springs the captain requested and received a change of flight plan in order to remain at 11,000 feet.

Approximately at the time Flight 14 reported over Rock Springs, United Air Lines' Flight 44, en route from Oakland, California, to Cheyenne,

* All times referred to herein are Mountain Standard and are based on a 24-hour clock.

Wyoming, transmitted a position report over that station at the same altitude. As the two aircraft approached Sinclair at 11,000 feet, the pilots of Flight 44 observed the lights of Flight 14 approximately one mile ahead and apparently on the left side of the airway. The two aircraft appeared to be on converging flight paths and, before reaching Sinclair, Flight 14 was directly ahead of Flight 44. The crew of the latter aircraft observed that Flight 14 appeared to pass over the range station at Sinclair, Wyoming, and to take up a heading directly toward Laramie, Wyoming. Flight 44, meanwhile, maintained a course close to the left hand side of the airway and the pilots continued to watch Flight 14 as it bore to the right in the direction of Elk Mountain. Having encountered scattered-to-broken clouds at his cruising altitude in an area approximately 30 miles east of Sinclair, the captain of Flight 44 climbed to 11,300 feet where he was able to cruise above all clouds. From this point the lights of Flight 14 were intermittently visible to the co-pilot of Flight 44 through breaks in the clouds and the aircraft appeared to be approximately three miles to the right of the airway slightly below the cruising altitude of Flight 44.

Shortly thereafter the co-pilot of Flight 44 observed a bright flash off to his right and a red fire which appeared to glow through the clouds. Fearing that an accident had occurred to Flight 14, the pilot of Flight 44 immediately attempted to establish contact with it without success. At approximately the time of the accident United Air Lines Flight 28 was proceeding westward from Laramie at an altitude of 12,000 feet and also observed the bright red glow from the vicinity of Elk Mountain. Subsequent attempts to contact Flight 14 by ground stations were unsuccessful and it

became apparent that the flight had struck Elk Mountain.

Investigation

An aftercast of the weather situation at the time and in the vicinity of the accident indicated that winds aloft were from 300 degrees to 310 degrees, between 50 and 55 miles per hour. A United Air Lines' pilot operating over this portion of the airway testified that scattered-to-broken clouds existed at 11,000 feet. This observer also indicated that there was a definite overcast around the summit of Elk Mountain extending approximately five miles in all directions. Although the clouds were reported to have been 300 feet in thickness it was estimated that in the immediate vicinity of Elk Mountain clouds could have been between 500 and 1,000 feet in thickness.

Adverse weather conditions prevailing soon after the accident delayed the arrival at the scene of investigators of the Safety Bureau of the Civil Aeronautics Board. Although several attempts were made to climb Elk Mountain the following day by personnel from local Army stations, extremely low temperature and heavy snowdrifts made it impossible. Approximately seven days after the accident had occurred, a Board investigator was able to reach the scene of the accident and to accomplish a cursory inspection of the wreckage. Because of the impossibility of completing a satisfactory examination due to the heavy snow which covered the wreckage, arrangements were made to return to Elk Mountain during late June at which time most of the snow would have melted from the scene of the accident.

On June 25, investigation of the wreckage was continued under more

favorable conditions. With the exception of the left engine which had rolled over the crest of the hill and into a large snowbank, most of the debris was accessible for inspection. Examination of the seats and the broken seat belts indicated that both pilot and co-pilot were at their respective stations at the time of impact. Marks of impact on the ground indicated that the aircraft was in approximately level flight at the time of the accident. Distinct propeller marks had been cut in the face of the mountain and both wings were torn completely from the fuselage. The fuselage disintegrated as it slid up the mountain slope for a distance of approximately 200 yards. Some parts of the aircraft continued along the direction of flight over the top of the ridge rolling down the east side.

Inspection of the radio panel disclosed the fact that the ADF receiver was tuned to 235 kilocycles at the time of the accident and that the range receiver was tuned to 212 kilocycles. The frequency of the Laramie radio station is 236 kilocycles and that of Sinclair is 212.

A survey of the direction of flight at the time of impact indicates that Flight 14 was on a magnetic course of 80 degrees at the time of the accident. Inasmuch as winds of 50 to 55 mph at a relative wind angle of 235 degrees were experienced, it is probable that approximately 14 degrees of wind drift would have been experienced along the course between Sinclair and Laramie. Laramie is on a magnetic bearing of 98 degrees from Sinclair and, if the wind conditions remained constant throughout the course, a magnetic heading of 84 degrees would have been required to negotiate such a course.

The airway eastward from Sinclair parallels the center of the east leg of the Sinclair range to the intersection with the northwest leg of the

Laramie range. From this point it bends sharply to the right toward Laramie on a heading of 137 degrees. The distance between Sinclair and Laramie via airway Green 3 is 88 miles while the distance between the two range stations on a direct course is 79 miles. The point of impact on the southwest corner of Elk Mountain at an elevation of approximately 10,822 feet is located on a direct line between the Sinclair and Laramie radio range stations. The flight path of the aircraft in the vicinity of the accident had deviated south of the airway a distance of approximately 4-1/2 miles. Elk Mountain represents the highest terrain between Sinclair and Laramie within an area of 15 miles on either side of the direct course. The dog-legged airway was so designed in order to provide most effective clearance from the high terrain to the south.

The captain had recently returned to duty with United Air Lines after a tour of duty of two and one-half years with the Army Air Forces. Upon his return to United he was given six one-way qualifying trips over the route, two as a co-pilot and four as an observer riding the "jump" seat. The first officer was making his first scheduled flight over this route.

Investigation of Civil Aeronautics Administration communications records for the period including the time at which the accident occurred indicates that all navigation aids including beacon lights and radio facilities were functioning normally at the time of the accident.

That region of Wyoming in the vicinity of Elk Mountain is very sparsely settled and no witnesses were located who had either seen or heard Flight 14 from the ground immediately prior to or at the time of impact.

Discussion

The elevation at the top of Elk Mountain is 11,162 feet. Flight 14

struck Elk Mountain at an elevation approximately 340 feet below that of the crest of the mountain and approximately 180 feet below the assigned cruising altitude. Such a deviation cannot be considered unusual and could be explained by decrease in the barometric pressure as the flight proceeded eastward and the unusually low temperature encountered in that area.

The magnetic heading required under the conditions of the winds aloft and magnetic variation in the area of Elk Mountain in order to maintain a direct course between Sinclair and Laramie was approximately 84 degrees. Although it has been determined that the aircraft was actually on a magnetic course of 80 degrees at impact, the point of impact was on a direct line from the Sinclair to the Laramie radio range stations the magnetic bearing of which is 98 degrees. It is unlikely that the same wind direction and velocity would have prevailed at the surface of Elk Mountain and the actual wind drift experienced by Flight 14 immediately prior to impact is impossible to determine. It therefore appears that Flight 14 had deviated from the airway in order to maintain a direct course between these two points. This conclusion is further confirmed by the fact that the aircraft ADF receiver was tuned to the frequency of the Laramie radio range station. Although the possibility may exist that the deviation from the airway had been a result of wind drift, it is apparent that the captain of the flight was aware of the winds aloft inasmuch as he had navigated without apparent difficulty to Sinclair from Portland, Oregon. It is extremely unlikely, therefore, that such wind drift was experienced without the knowledge of the captain.

Testimony of pilots operating along Airway Green 3 at approximately the time of the accident and weather data furnished by the Weather Bureau

indicate the likelihood that Flight 14 encountered some clouds in the area of Elk Mountain and that at the time of impact the pilot was actually "on instruments".

No evidence was disclosed as a result of examination of the wreckage, inspection of the aircraft maintenance records or testimony of the pilots of Flight 44 to indicate failure of either the powerplants or the aircraft structure. The request by the captain for charge in clearance to permit the flight to remain at 11,000 feet and the fact that the point of impact was at an elevation reasonably close to 11,000 feet indicate that the pilot was experiencing no undue difficulty in maintaining his cruising altitude. Impact marks on the face of the mountain further indicate that the aircraft was in straight and level flight and apparently under control. It must be concluded, therefore, that the pilot maintained a cruising altitude which did not provide adequate clearance over Elk Mountain, that the pilot departed from the normal course along Airways Green 3; and that the aircraft struck Elk Mountain while "on instruments".

Findings

On the basis of all available evidence, the Board finds that:

1. The pilots, aircraft, and crew were properly certificated for the flight.
2. An instrument flight plan was authorized for Flight 14 which included a cruising altitude of 13,000 feet between Sinclair, Wyoming, and Laramie, Wyoming.
3. When over Rock Springs range station the captain requested and received approval of a change of flight plan in order to permit him to remain at 11,000 feet.

4. Until reporting over Sinclair, Wyoming, the flight had been entirely routine.

5. The flight deviated from the prescribed route and followed the most direct course between Sinclair and Laramie.

6. The ADF receiver was tuned to the Laramie radio range station.

7. At 0247, Flight 14 collided with Elk Mountain at an elevation approximately 180 feet below its assigned cruising altitude and $4\frac{1}{2}$ miles south of Airway Green 3, and was demolished by impact and fire.

Probable Cause

On the basis of the foregoing the Board finds that the probable cause of this accident was the deviation from the prescribed route at an altitude insufficient to assure adequate clearance over Elk Mountain.

BY THE CIVIL AERONAUTICS BOARD:

/S/ OSWALD RYAN

/S/ HARLEE BRANCH

/S/ JOSH LEE

Landis, Chairman, and Young, member, did not take part in the decision.

SUPPLEMENTAL DATA

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident at 0445, January 31, 1946, and an investigation was initiated in accordance with Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. Air Safety investigators of the Board's Kansas City office proceeded immediately to Denver, Colorado, to make arrangements for visiting the scene of the accident. Because of the nature of the terrain and the severity of the weather conditions, it was impossible for investigators to climb Elk Mountain immediately for an inspection of the wreckage. In view of the fact that Army personnel and a Board investigator reported that the wreckage was covered with snow and that parts of the aircraft were buried deeply in snowdrifts, it was decided that a detailed inspection would not be feasible until well into the summer. An inspection of the wreckage was accomplished June 25, 1946. However, a public hearing was ordered by the Board and was held at Cheyenne, Wyoming, February 15 and 16, 1946.

Air Carrier

United Air Lines was incorporated under the laws of the State of Delaware and has established its headquarters at Chicago, Illinois. At the time of the accident the company was operating under a Certificate of Public Convenience and Necessity and an Air Carrier Operating Certificate, both issued pursuant to the Civil Aeronautics Act of 1938, as amended. These certificates authorized United Air Lines, Inc., to engage in air transportation of persons, property and mail between various points, including Boise, Idaho, and Denver, Colorado.

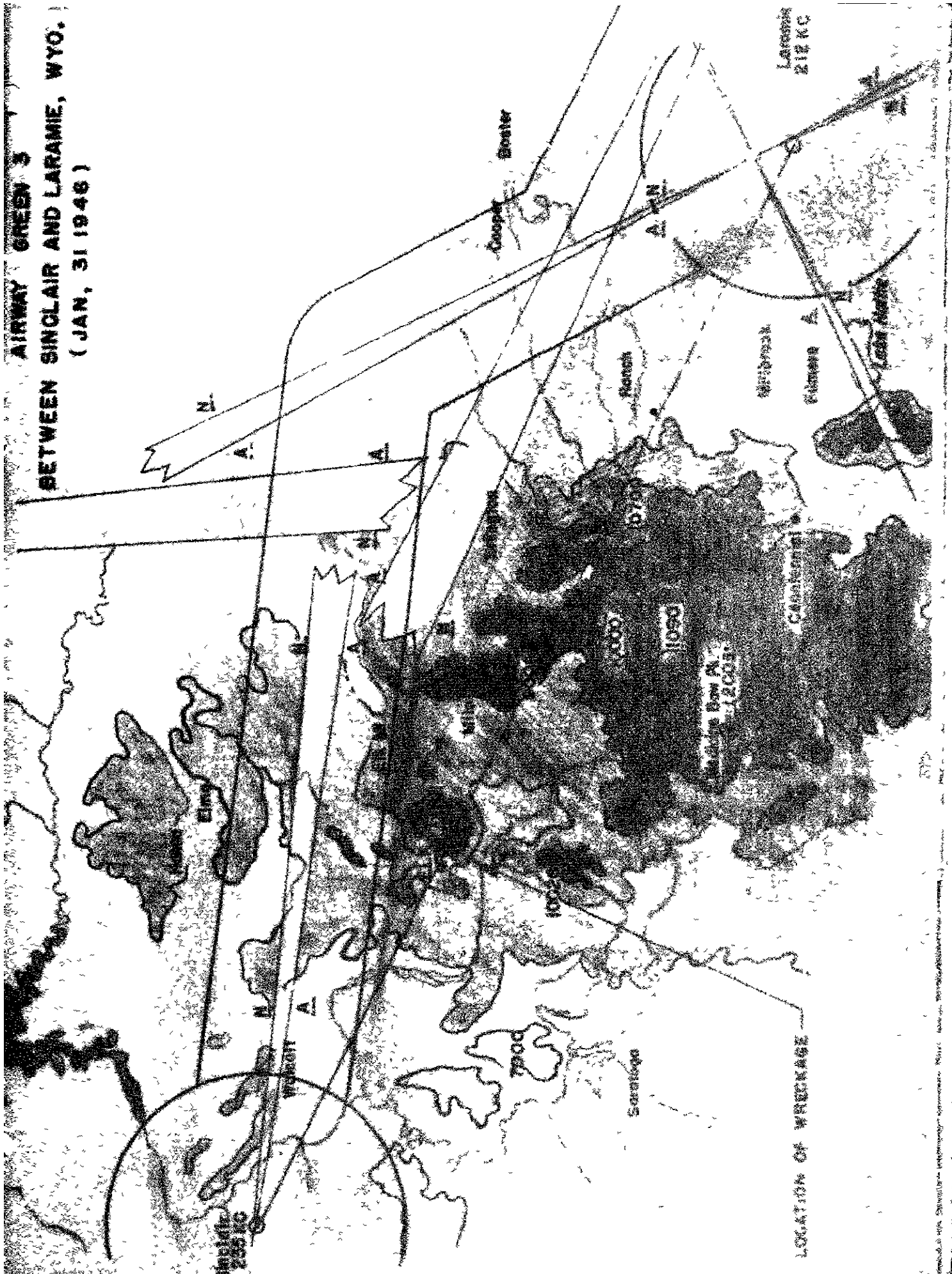
Flight Personnel

Captain Walter Paul Briggs, Portland, Oregon, age 43, had been employed by the company since September 1, 1931, and had accumulated a total of 13,003 hours, of which 2,909 hours had been obtained in DC-3 equipment. First Officer Harry N. Atlas, Helena, Montana, age 27, was co-pilot and had been employed by the company since October 5, 1945. He had accumulated a total of 2,021 hours, of which 21 hours had been obtained in the service of United Air Lines as co-pilot in DC-3 equipment. Dorothy J. Carter of Portland, Oregon, was Stewardess.

Aircraft

The Douglas DC-3, NC-25675, had been operated a total of 16,333 hours, of which 2,602 had been accumulated since the last major overhaul. Two Pratt and Whitney R1830-92 engines were installed and were equipped with Hamilton Standard, hydromatic propellers. The left and right engines had accumulated a total of 15,794 hours and 12,659 hours, respectively, each having been operated a total of 288 hours since overhaul. At the time of take-off from Boise, the total weight of the aircraft was within its maximum gross limits and the load was distributed with respect to its center of gravity within approved limits.

**AIRWAY GREEN 3
BETWEEN SINCLAIR AND LARAMIE, WYO.
(JAN, 31 1946)**



LOCATION OF WRECKAGE

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CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.

B75

Date. March 1, 1946

To: Assistant Director - B-81

From: Chief, Investigation Division B-95

Reply for my signature.

For your information

See me reference this.

Please handle.

Investigate and report.

Comments:

See
~~*Peacock, D. S.*~~
Good example of
Controlled Contact - 9 month
flight
Homer

-	-	Allentown-Ber
3	5	Baltimore
1	1	Boston
-	6	Camden
3	3	Chicago
-	-	Cincinnati
-	-	Cleveland
1	1	Columbus
1	1	Dayton
-	1	Jacksonville
1	1	Memphis
-	3	Miami
5	16	New York
1	1	Pittsburgh
1	1	Portland
-	4	Richmond
-	1	Savannah
-	-	Tampa
-	-	Vero Beach
4	14	Washington
-	3	W. Palm Beach
<u>21</u>	<u>62</u>	TOTAL

In accordance with the recent policy of the Safety Bureau the following is a summary of the facts, conditions and circumstances disclosed at the hearing of United Air Lines' accident to Flight 44 at Elk Mountain, Wyoming on January 31, 1946. This summary is quoted from memory since the transcript of the hearing is not available at this time.

Received

SEP 30 1947

FACTS, CONDITIONS AND CIRCUMSTANCES

Safety Rules Division

Accident involving United Air Lines' aircraft NO 29675 at Elk Mountain, Wyoming, approximately 0817, January 31, 1946. Flight 44 departed Portland, Oregon, at 2000 on January 30, 1946. The flight plan was submitted in accordance with the usual procedure and was approved by the dispatcher prior to the departure of the aircraft. Flight then proceeded to Boise with stop at Pendleton, Oregon, in a routine manner, upon which we have no comments to make. After being serviced at Boise, the flight consisting of a crew of three and eighteen passengers departed Boise to Denver with no special procedure when weather over the airway permits such an operation, otherwise flight stops at Rock Springs, Wyo., for refueling. As the flight approached Rock Springs, the Captain requested and received a change in flight plan which permitted him to remain at 11,000 feet, Rock Springs to Denver, instead of climbing to 13,000 feet as originally authorized. As Flight 44 proceeded along the airway, NAL Flight 44 on route from Oakland to Chicago at the same altitude, observed the lights of Flight 44, the approximately same mile ahead and apparently on the left side of the airway. As Flight 44 approached Sinclair, Wyo., it crossed ahead directly over the range station and apparently took up a heading towards Denver. Flight 44, also proceeding along the right side of the airway, advised Flight 44 to keep heading off to the right towards the direction of Elk Mountain. As scattered to broken clouds

were encountered by Flight 14, the Captain rolled to the left approximately 30° and climbed to 11,500 feet where he was on top of this condition. The copilot on Flight 14 could still see the lights of Flight 14 through the breaks in the clouds which at this time appeared to be approximately three miles away and at a lower altitude. A short time later the copilot of Flight 14 observed a bright flash off to his right, which appeared to come through the clouds, and thereafter a red glow. The glow on the mountain was also observed by United Flight 28 which was proceeding west from Laramie at 12,000 feet along the airway. Both the Captain and First Officer of Flight 14 decided that although they were not positive, they were relatively sure that Flight 14 had struck Elk Mountain. This was later confirmed when attempts to contact Flight 14 by radio were unsuccessful and the wreckage was later found on the northwest slope of Elk Mountain at approximately a 10,000 foot level.

The weather conditions between Laramie, Wyo., and Steamboat, Wyo., as reported by the United States Weather Bureau indicated scattered clouds along the airway, however, the pilots who flew the route that morning testify that the cloud condition along the airway and in the vicinity of Elk Mountain were scattered to broken at 11,500 feet. Wind aloft were from 300 to 310° velocity, 50-55 miles per hour. United pilots also testify that there was a definite cloud cap around the summit of Elk Mountain and extending approximately five miles. None of the flights reported any severe turbulence along the airway in this vicinity. The thickness of the clouds along the airway was reported approximately 500 feet, however, it is estimated that the clouds in the vicinity of Elk Mountain could have been between 500 and 1,000 feet.

A complete examination of the wreckage was impossible due to the extreme adverse weather conditions prevailing at the scene of accident, which, however, was reached by one of the Board's Investigators. Nevertheless an examination was made which showed that the aircraft struck the southwest slope of Elk Mountain at approximately the 10,000 foot level and the wreckage was scattered approximately 1500 feet beyond. The appearance of the markings on the slope at the point of initial impact indicate that the aircraft was in a horizontal attitude.

There was a discrepancy between the testimony of the airline officials and the ALPA representatives as to the actual number of propeller marks observed on the ground. The airline personnel stated that they observed three propeller marks on either side, while the ALPA representatives stated that they noticed four propeller marks on the left side and three propeller marks on the right side. The difference between propeller marks is also in dispute inasmuch as the ALPA representatives state that there was considerably greater distance between the first mark and the last three marks on the left side and that the marks on the right were similar to the last three marks on the left side. Also there was observed by the Investigators on the mountain, a difference between the two propellers, particularly in the manner in which the blades were bent or broken. One blade was broken forward on one propeller and backward on the other.

While it was impossible to make a detailed examination of the wreckage it should be done at a later date. The local rangers testify that the most favorable time to conduct further examination would be around June 15. An arrangement was made at the hearing whereby this office and UIC will take concerted action at the earliest possible time.

FACTS DEVELOPED AT THE HEARINGS.

1. The Captain had recently returned from the Armed Services. Prior to this duty he had been a United Air Lines captain over this route. During the tour of duty he had flown Army C-47 airplanes (Military version of the DC-3) a total of about 1800 hours. Upon his return to United he had been given three round trip qualifying runs over this route. Although five such round trips are ordinarily required, the GAI allows complete qualification to be effected by persons of his status by one trip. Of these three qualifying runs, one was as a copilot and two were as an observer riding the jump seat. A company check pilot was not present during any of these three trips.

2. The First Officer was making his first scheduled run over this route and presumably was seated on the right-hand side; had the flight remained on the airway, the mountain which was struck would have been on his side.

3. The site of impact is almost directly on a straight line between the Sinclair and Laramie radio stations. It is so close to this straight line as to appear more than coincidental and to suggest strongly that the Captain was heading on Laramie.

4. The altitude of the point of impact was within the normal limits of the planned cruising altitude. It appears unlikely that any warning turbulence would have been felt by the crew immediately prior to the crash, inasmuch as the aircraft was approaching the steep slope almost exactly down wind.

5. The nature of the thin and ice crystal type of cloud existing near the top of Elk Mountain at the time, coupled with the fact that the mountain top was snow covered, is almost sure to mean that the ship was on instruments at the time of impact.

6. Further to strengthen the possibility of Flight 14 having headed on Larocis, is the fact that Flight 14 was observed by personnel of Flight 14 to be to the left of the airway just before reaching Sinclair and in such a position that a straight line from where they then were would pass over the Sinclair range station. Subsequent examination of the radio receivers may prove or disprove this supposition.

7. Further back on the route of this subject flight there is a dog-leg between Kemmerer and Beck Springs. The distance via airways between these two points is approximately ninety miles. The distance direct between them is approximately seventy miles and seventy miles was shown on the Captain's flight plan which may have indicated that he had planned to cut this dog-leg. The fact that the flight was slightly ahead of schedule at the time of the accident would further strengthen this possibility. Although flight plans are often merely technicalities rarely used during flight, the relatively inexperienced copilot may have made entry of the Captain's actual intentions.

8. To refute the possibility of the Captain having attempted to fly directly from Sinclair to Larocis, is the fact that the direction of impact as determined by stream wreckage was 86° magnetic. The direction of the east leg of the Sinclair range which he should have been following is 79° magnetic. This suggests that Captain Briggs may have been merely off to his right, or south, as far as he thought he safely could and still remain on the airways with the intention of cutting the corner at the actual intersection a trifle short.

9. A conjecture as to why the aircraft although on a heading heading for Larocis was on its correct magnetic course from Sinclair might be as follows: The ships flight papers were found fully completed, bearing

Briggs' signature. This proves that at some stage, probably the latter stage of the flight, the copilot had been flying. If the Captain upon finishing his paper work had realized that the aircraft was off the airway, he may have taken control and initially put it back upon its right magnetic heading. This appears highly conceivable in view of the fact that the aircraft must have penetrated instrument weather only very slightly before the crash.

10. Investigation disclosed that all aids of navigation, both lights and radio, were functioning normally at the time of impact.

11. It is most unlikely that the Captain left the cockpit allowing a new copilot to be there alone. The only point that could be unearthed in this connection is the testimony of the girl United Air Lines radio operator at Salt Lake City who took the last ship position report from Flight 14 when it was over Sinclair. She testified that the exact and precise phraseology used in this report must surely have come from an experienced captain and not from a new copilot whose manner of transmission normally is awkward and inexperienced. Therefore we conclude that Captain Briggs was in the cockpit at the time of this message, presumably seven minutes before the crash.

12. The site of the crash was approximately five miles to the right, or south, of the right-hand boundary of the airway (Green No. 3). Deviation from the airway over this route is forbidden in United Air Lines' operating procedure manual Page 564, Paragraph 32. It is further forbidden by the FAR under the terms of the Civil Aeronautics Authority specifications and the company's acceptance thereof for operating procedures as outlined in their route operations specifications.

13. The night flying time of Captain Briggs since he returned from the Military Services was 764½ hours, broken down as follows:
Observer 144½; First Officer 104½ and Captain 511. The night flying

time of Mr. Atlas since the date of his employment was, night landings at the Denver Training Center 1:50 and as First Officer 11:15, making a total of 12:45 hours.

14. During the course of the investigation every effort was made to contact lay witnesses that might have seen the airplane in flight prior to the accident. Numerous people were contacted back along the flight path to Sinclair, as well as GAA personnel at radio fixes along the airway to Rock Springs, but none were found.

PROBABLE CAUSE:

The probable cause of this accident was the unauthorized deviation of the flight from the airway together with the Captain's failure to follow the approved contact flight plan.

The following recommendations are attached hereto for your consideration:

1. Suggested change in Special Regulation 303-1
2. Suggested change in route altitude authorization
3. It is suggested that a non-directional radio (for homing) be installed at the intersection of any pair of airways where higher terrain exists off the airway ^{than} and on the airway paper.

Additional Attachments:

1. Report on Sun Spots
2. Meteorological Report on Weather

W. K. Andrews

Robert W. Christ

R. W. Christ

RECOMMENDATION NO.1. (RE: HAL Accident, Elk Mountain, Wyo. 1-31-46)

Effective as of August 22, 1945, the Board adopted a Special Civil Air Regulation, Serial No. 323-A, which reads as follows:

"Notwithstanding the provisions of §§ 61.5140(a), 61.5141(b), 61.5150(a), and 61.5151(b), any first pilot who on or subsequent to December 7, 1941, was qualified as such and as competent over a regular or alternate route and who has been employed as first pilot in military air transport operations will be considered competent over such route after completing over the route either (a) one one-way trip as first pilot accompanied by a check pilot or (b) two one-way trips as second pilot.

"This regulation shall terminate March 1, 1946."

During the investigation and subsequent hearing on the above-mentioned accident it was established that Captain Briggs had recently returned from three and a half years of military service and that he had complied with this regulation inasmuch as he had completed three round trips over the route on which the accident occurred. Irrespective of the number of trips, no one was made responsible for checking his qualifications along the route. In other words, although he made the necessary trips, no one could certify as to his familiarization with the route procedures or with the terrain along the route. It is therefore believed that the scope of these regulations should be enlarged and that before any pilot is qualified for route competency he should be certified by the company by whom he is employed and a statement made that he has complied with the regulations and that the company is convinced from actual check that the pilot is fully qualified. It is also believed that this policy should be adopted when issuing an original route competency.

RECOMMENDATION NO. 2. (RE: UAL Accident, Elk Mountain, Wyoming - 1-31-46)

The preparation of a flight plan includes the altitude of intended flight along the route between radio fixes. Usually these specified altitudes are not less than the minimum instrument altitudes. It is believed that to require on all flights dispatched by scheduled air carrier that a 1000-foot clearance of all obstacles within the airways or within 10 miles either side of the authorized route would not cause undue hardship. This should be required of all flights dispatched in accordance with instrument or contact flight rules and regardless of whether they are conducted day or night.

It is therefore recommended that Civil Air Regulations 61.740, 61.7400, 61.7401 and 61.741 be substituted with a suggested change in altitude requirement, as follows: Flight Altitude Rules: Except during takeoff, landing and final approaches, or when operating in accordance with specific procedures by definite localities approved by the Administrator, no scheduled air carrier aircraft shall be flown at an altitude less than 1000 feet above the highest obstacle located within its prescribed airways, or if there be no airways, within 10 miles on either side of the center of the authorized route. In the event there is a deviation from the prescribed airway or authorized route no scheduled air carrier aircraft shall be flown at an altitude of less than 1000 feet above the highest obstacle located within a horizontal distance of 10 miles within the intended track to be flown.

Had such a provision been in the regulation it is probable that the American Airlines accident at Marion, Virginia; the PCA accident at Morgantown, West Virginia and the UAL accident at Elk Mountain, Wyoming would not have occurred. A search of our accident records of scheduled air carrier would be very enlightening on the subject.

It is recommended that immediate consideration be given to this suggestion.

RECOMMENDATION NO. 3.

That a non-directional radio (for homing) be installed at the intersection of any pair of airways where higher terrain exists off the airway and on the airway proper.