

CIVIL AERONAUTICS BOARD

AIRCRAFT ACCIDENT REPORT

ADOPTED: January 15, 1962

RELEASED: January 22, 1962

ARCTIC-PACIFIC, INC , CURTISS WRIGHT, SUPER C-46F,
N 1244N, TOLEDO EXPRESS AIRPORT, TOLEDO, OHIO,
OCTOBER 29, 1960

SYNOPSIS

At approximately 2202 e.s.t., October 29, 1960, an Arctic-Pacific, Inc., Super C-46F, N 1244N, crashed during takeoff from the Toledo Express Airport, Toledo, Ohio. Of the 45 passengers and 3 crew members aboard, 20 passengers and the captain and copilot were fatally injured.

N 1244N of Arctic-Pacific, Inc., a supplemental air carrier, was chartered to transport the California State Polytechnic College football team from Santa Maria, California to Toledo, Ohio, and return. The aircraft took off from Toledo Express Airport on the return flight to San Luis Obispo in weather conditions of 9/10th partial sky obscuration; zero visibility in fog; and weighing approximately 2,000 pounds more than its maximum certificated gross weight of 47,100 pounds. The aircraft crashed approximately 5,800 feet from the threshold of the takeoff runway, caught fire, and was destroyed.

The Board has determined that the probable cause of this accident was loss of control during a premature liftoff. Contributing factors were the overweight aircraft, weather conditions, and partial loss of power in the left engine

As a result of this accident the Federal Aviation Agency, on October 31, 1960, suspended the air carrier operating certificate issued to Arctic-Pacific in accordance with Section 609 of the Federal Aviation Act of 1958. Subsequently the operating certificate, which expired on November 14, 1960, was not renewed.

The FAA has also published a notice in the Airman's Guide and has instructed its tower operators to withhold takeoff clearance from an air carrier or other commercial aircraft operated for the purpose of carrying passengers or property for compensation or hire when the prevailing visibility for the airport of departure or runway visibility for the departure runway is less than one-quarter of a mile, or runway visual range is less than 2,000 feet.

Investigation

N 1244N departed from the Arctic-Pacific main base at the Oakland International Airport, Oakland, California, on October 27, 1960. The schedule for the flight shows that it departed with a four-man crew plus one stewardess, and that Captain Donald L. J. Chesher was the senior pilot on board. The crew on board at departure were Captain Donald L. J. Chesher, Captain Robert P. Fleming, Copilot Howard Perovich, Copilot Lucien Tessier, and Stewardess Susan Faith Miller.

The schedule called for Captain Fleming and Copilot Tessier to fly the aircraft from Oakland, California, to Kansas City, Missouri, with intermediate stops at Santa Maria, California, to board the California Polytechnic College football team, and at Albuquerque, New Mexico, for fuel. At Kansas City, Captain Fleming and Copilot Tessier were scheduled to leave the flight. Captain Chesher and Copilot Perovich were then to fly the aircraft from Kansas City to Toledo, Ohio, off-load the California Polytechnic College football team, then proceed as a ferry flight to Youngstown, Ohio. At Youngstown, the crew was to lay over until the morning of October 28th, and board the Youngstown University football team for a nonstop flight to New Haven, Connecticut. A layover of approximately 30 hours was scheduled at New Haven, Connecticut. Captain Chesher and Copilot Perovich were then to transport the Youngstown University football team from New Haven to Youngstown, ferry the aircraft to Toledo, board the California Polytechnic College football team, and fly to Kansas City, Missouri. Captain Fleming and Copilot Tessier were then to rejoin the flight for duty back to Santa Maria and Oakland, California.

Investigation revealed the following schedule was flown by the aircraft from the departure at Oakland International Airport on October 27, 1960, to the time of the accident:

	<u>Airport</u>	<u>Time</u>	<u>Flight</u> <u>Time</u>	<u>Ground</u> <u>Time</u>	<u>Remarks</u>
Depart	Oakland	1335 Z ^{1/} (0535 p.s.t. ^{2/} 27th)		0	Chesher in Command No flight plan filed
Arrived	Santa Maria	1435 Z 27 (0635 p.s.t. 27th)	1:00		
Departed	Santa Maria	1611 Z 27th (0811 p.s.t. 27th)	0	1:36	Chesher in Command 48 persons aboard
Arrived	Albuquerque	2005 Z 27th ^{3/} (1305 m.s.t. ^{2/} 27th)	3:54	0	
Departed	Albuquerque	2144 Z 27th (1444 m.s.t. 27th)	0	1 39	Chesher in Command 48 persons aboard
Arrived	Kansas City	0110 Z 28th ^{4/} (1910 c.s.t. ^{4/} 27th)	3.26	0	
Departed	Kansas City	0242 Z 28th (2042 c.s.t. 27th)	0	1:32	Chesher in Command 2nd crew disembarked at Kansas City 46 persons aboard
Arrived	Toledo	0522 Z 28th ^{5/} (0022 e.s.t. ^{5/})	2 40	0	43 persons disem- barked at Toledo
Departed	Toledo	0708 Z 28th (0208 c.s.t. 28th)		1:46	Chesher in Command Ferry to Youngstown
Arrived	Youngstown	0800 Z 28th (0300 e.s.t. 28th)	0:52	0	Chesher slept in airport lounge

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- 1/ Greenwich Civil Time
 - 2/ Pacific Standard Time
 - 3/ Mountain Standard Time
 - 4/ Central Standard Time
 - 5/ Eastern Standard Time

	<u>Airport</u>	<u>Time</u>	<u>Flight Time</u>	<u>Ground Time</u>	<u>Remarks</u>
Departed	Youngstown	1326 Z 28th (0826 e.s.t. 28th)	0	5:26	Chesher in Command Approximately 45 persons aboard.
Arrived	New Haven	1615 Z 28th (1115 e.s.t. 28th)	2:49	0	Approximately 45 persons disembarked
Departed	New Haven	2125 Z 29th (1625 e.s.t. 29th)	0	29:10	Chesher in Command Approximately 47 persons aboard.
Arrived	Youngstown	2309 Z 29th (1809 e.s.t. 29th)	1:45	0	Approximately 42 persons disembarked
Departed	Youngstown	2355 Z 29th (1855 e.s.t. 29th)		0:46	Chesher in Command Ferry to Toledo
Arrived	Toledo	0057 Z 30th (1957 e.s.t. 29th)	1:02	0	
Departed	Toledo	0301 Z 30th (2201 e.s.t. 29th)		2:04	Chesher in Command 48 persons aboard Aircraft crashed at 2202 e.s.t. during takeoff

N 1244N was ferried from Youngstown, Ohio, to Toledo, Ohio, Saturday, October 29, 1960. At the time of arrival of the aircraft at Toledo, the weather conditions were: sky partially obscured, visibility 3/4 mile in fog.

Following the arrival at 1957 e.s.t.,^{6/} records reveal that 150 gallons of 100-octane fuel were added to the left and right center tanks, and 327 gallons of 91-octane fuel were added to the left and right front auxiliary tanks to bring the total fuel aboard to 1,062 gallons. No fuel was put in the aft tanks nor were these tanks checked for any fuel by the servicing personnel. Nine gallons of oil were added - 2 gallons to the right engine, and 7 gallons to the left engine.

The meteorologist-technician on duty at the Toledo Express Airport, U. S. Weather Bureau office, stated the pilot of N 1244N visited the office for a weather check between 2030 and 2100 hours. At the time of this weather briefing, the weather at Toledo Express Airport was recorded as partial obscuration; visibility 1/16 of a mile in fog; wind from the north at 3 knots; 7/10th of the sky obscured by fog, runway visibility transmissometer inoperative.

The meteorologist-technician stated that at about 2115, the pilot of N 1244N returned to the weather station to utilize the direct communication line to the control tower for filing a flight plan. At this time, he was given the 2100 aviation weather sequence for Kansas City. No further weather information was given during this final contact with the pilot.

Fog and/or low stratus were reported all day at Toledo Express Airport with conditions varying from ceiling and visibility zero to ceiling 800 to 1,300 feet

^{6/} All times in the remainder of this report are eastern standard based on the 24-hour clock.

and visibility 2-1/2 miles. A record special observation at 1658 showed a partial obscuration, visibility 2 miles in fog. This partial obscuration caused by the fog continued to be reported until after the accident. The visibility deteriorated steadily so that the 1900 observation showed 3/4 mile visibility; a special observation at 2037 showed 1/16-mile visibility; and all observations from 2133 until after the accident showed visibility zero in fog.

The transmissometer on runway 07 at Toledo Express Airport was not functioning properly during the briefing of Captain Chesher. This was discovered shortly after 1856 and, in accordance with existing instructions, the remark "RVNO" was appended to all subsequent aviation weather sequence reports for Toledo Express Airport, indicating the nonavailability of runway visibility information.

Investigation disclosed that following the weather briefing, Captain Chesher returned to the Remmert-Werner ramp, where N 1244N was parked, and the passengers and cargo were loaded aboard the aircraft. At this time Captain Chesher made a walking tour of the ramp in an effort to determine where aircraft were parked, and Copilot Perovich made a walkaround inspection of the aircraft. Captain Chesher then returned to the aircraft, and at approximately 2138 the engines were started.

Personnel who assisted in the refueling and starting of the engines stated they could barely observe lights at a distance of 160 feet at the time the engines were started. These witnesses state the engines started without any difficulty or backfiring. Other witnesses stated the density of the fog was fluctuating.

At approximately 2139, the pilot of N 1244N called the tower for taxi clearance and was cleared to taxi to runway 25. The pilot requested takeoff on the ILS runway and was recleared to runway 07, to hold short of the runway, and to use extreme caution due to the unlighted aircraft parked on the ramp. Toledo Express Airport weather at this time was partial obscuration; zero visibility in fog; 9/10ths of the sky obscured by fog. Arctic-Pacific, Inc., minimums for takeoff from Toledo Express Airport were 300 feet ceiling and 1-mile visibility, or 400 feet ceiling and 3/4ths-mile visibility on the sliding scale.

The pilot advised the tower controller that he knew the location of the parked aircraft because he had made a walking tour of the ramp. The pilot then asked the tower controller if the taxiway lights were on and was advised that everything was "wide open," meaning that all lights were at full intensity. Refueling personnel with flashlights assisted in directing the pilot down the ramp to the entrance of the taxiway.

At 2150, the tower advised N 1244N that they had his clearance when he was ready to copy. The pilot then asked for the magnetic bearing of the runway and was advised that it was 069 degrees. The tower then delivered the following clearance: "44 November is cleared to the Oklahoma City Airport via Waterville Victor 47 to Findlay, Victor 14, climb to and maintain 7,000, Cleveland Center on 127.9 and on tower release; if unable, stand by on Findlay Radio."

The pilot then advised that his destination was Kansas City and not Oklahoma City and that he wanted preferred routing. The tower personnel requested a change in the flight plan from the Cleveland Center and while the change in flight plan was received, the aircraft was cleared into position on the runway to hold.

At 2155, the corrected clearance was delivered to N 1244N as follows:
"44 November is cleared to the Kansas City Airport via Victor 92 Joliet, Victor 262, Victor 10. Maintain 8,000. Contact Chicago Center 127.45; if unable, 128.4 - - - Tower release."

N 1244N was then asked by tower personnel how many runway lights he could see. The pilot of the aircraft answered, "three lights," and then asked how far apart the lights were. The tower operator replied that the lights were about 300 feet apart.^{7/}

At 2201, N 1244N was cleared for takeoff with a left turn out of traffic to proceed southwest on the ILS localizer beam to join Victor 92 airway.

At 2201, the aircraft was heard to pass the tower. Surviving passengers described a swerve to the right followed by a swerve or violent swerve back to the left during the latter part of the takeoff run. These swerves were followed by an abrupt or lurching type takeoff. Passengers also described a shuddering or vibration shortly after takeoff followed by a left wing-down, nose-down attitude. Passengers aboard the aircraft and earwitnesses positioned on the airport stated they heard perceptible changes in the sound of the engine or engines. These witnesses also describe a momentary silence prior to the impact noise. The impact was described by witnesses as a "dull boom". At no time after the aircraft entered the taxiway had it been seen by any of the personnel on the airport due to heavy fog. It was 21 minutes from the time taxi instructions were requested until the accident occurred. No engine burnouts are known to have been accomplished during this time.

The aircraft's left wing struck the taxiway adjacent to runway 07 on a heading of 035 degrees magnetic and while in a left bank of from 60 to 90 degrees. The main impact occurred at the edge of the taxiway after the aircraft's left engine struck the ground and the aircraft cartwheeled on its nose. The impact site was approximately 5,800 feet from the threshold of runway 07 and 400 feet to the left of the centerline of this runway. The two powerplant assemblies separated at impact from the nacelles with the firewalls still attached to the engine mounts. The aft portion of the fuselage separated at fuselage station 333, and continued on the impact path, coming to rest inverted on the vertical stabilizer. The forward portion of the fuselage and wings, after cartwheeling, came to rest in an upright position after sliding rearward about 10 feet. Fire engulfed the right wing, cockpit, and forward cabin areas. The 26 survivors sustained injuries ranging from bruises and shock to serious burns and fractures. The majority were thrown from the wreckage during the breakup of the fuselage. Five survivors remained belted into their seats, hanging upside down. These five evacuated the aft fuselage section through the open main entrance door.

The forward portion of the fuselage from station zero to 296.5 suffered severe fire and impact damage. The rear portion of the fuselage from station 399 to 915.8 broke loose and showed very little impact damage and no fire damage.

The left wing tore loose from the fuselage at center wing station 60. The right wing remained attached to the fuselage center section. Both wing leading edges were damaged by fire.

^{7/} The runway lights at Toledo Express Airport are approximately 200 feet apart.

Both landing gears and the tail wheel were in the "down" position at impact. The flaps were in the "up" position on impact.

The left engine installed on the aircraft was a Pratt & Whitney Model R-2800-79 which was not certificated for use on C-46 series aircraft. The engine was an Air Force surplus engine which had been overhauled on January 9, 1957, under military specifications by Oakland Aircraft Engine Service, Oakland, California. Arctic-Pacific purchased the engine in July 1960 from a salvage company for use on N 1244N. Prior to installation on the aircraft, the engine was not adequately inspected internally in accordance with Civil Air Regulation 42.30^{8/}

The engine was delivered to Newark Air Service, a certificated repair station, for installation on the aircraft; however, they failed to attest to the airworthiness of the engine as required by Part 52 of the CARs.^{9/} During installation of the powerplant assembly, the engine was modified by the installation of the carburetor and cylinder cooling baffles from the removed engine.

Most of the damage to the two powerplants was due to impact and ground fire, and no mechanical or internal failure to engines or accessories could be found. All the bearings and bushing of the engines were found intact and lubricated, and normal reciprocating action could be obtained. The oil system components were free of abnormal wear patterns, and there was no contamination by foreign material.

The combustion chambers of both engines showed no piston or valve burning, cylinder wall scuffing, or fusing or peening of the spark plug electrodes. The spark plugs in both engines, however, were moderately to heavily coated with carbon deposits.

The intake and exhaust manifolds of the two powerplants showed no in-service failures; however, the intake manifold for cylinders Nos. 8 and 9 of the left engine revealed the gland nut at the blower case to be completely disconnected and lying loose around the manifold. The area around the manifold was heavily sooted.

^{8/} CAM 42.30-1(f) states: "No engine or other major component which has not been maintained in accordance with the maintenance manual shall be installed in a large aircraft unless such engine or component is shown to be in an airworthy condition, and that it complies with current Airworthiness Directives. This may be accomplished by showing that the engine or component (1) is new and of current manufacture, (2) has been overhauled within the last 90 days by a certificated repair agency holding appropriate ratings, or (3) by disassembly to the extent necessary for the assigned agent to determine the airworthiness and extent of compliance with Airworthiness Directives and manufacturers' service bulletins."

^{9/} Newark Air Service, Inc., Hangar 12, Newark Airport, Newark, N. J., possessed an FAA Class III Airframe Repair Station Certificate which indicates they were adequately equipped to maintain, alter, and repair all-metal airframe construction up to and including 12,500 pounds maximum certificated takeoff weight. They also possessed a limited airframe rating for the maintenance, inspection, repair and alteration of specific model aircraft over 12,500 maximum certificated takeoff weight. They held no powerplant rating but could install engines under their airframe repair station certificate. Part 52.25 states "An applicant for a repair station certificate shall have an inspection system adequate for satisfactory quality control." Under Newark Air Service's airframe certificate, no powerplant modifications could be made.

The left magneto of the left engine had approximately 75 percent of the rotor contact burned away, four electrodes were severely arced, and the carbon brush in the electrode shield was burned away flush with the brush holder. Bench tests, however, indicated all four of the magnetos were capable of normal operation.

Testing of the spark plugs revealed 11 plugs which failed to test satisfactorily. Eight of these plugs were from four cylinders. After cleaning, all tested normally except three. Six fouled plugs, three from each engine, were given rating checks. All of these fired in the rating engine after a burnout procedure was conducted.

No in-service mechanical failures to the operating mechanisms of the two propellers could be found. Both propellers were found to be on the low-pitch stop position at the time of impact.

Much of the fuel system was consumed by ground fire. The fuel valves and emergency firewall shutoff valves, however, were recovered. The left fuel selector was approximately 10 degrees off the center tank position; the right selector was found positioned to the front tanks. The crossfeed valve was closed. The fuel strainers were intact and free of contamination. A sample of fuel taken from the left fuel strainer gave an octane rating of 103.5 when tested for octane rating by the Motor Method. No fuel was available for testing from the right strainer.

No weight and balance form for the trip from Toledo to Kansas City could be found, nor was the form available at the principal offices of Arctic-Pacific at Oakland Airport. Weight and balance forms were obtained for the Albuquerque to Kansas City trip and for the Youngstown to New Haven trip.

Since no weight and balance was available, the Board's investigators made an effort to determine what the maximum gross weight was for the departure from Toledo Express Airport. All baggage, football equipment, and cargo recovered from the wreckage was weighed. The total weight of this cargo was 1,470 pounds. In addition, fourteen suitcases or frames were counted in the wreckage in varying degrees of destruction. Since it was impossible to determine their exact weights, and since this luggage contained mostly clothing, college textbooks, and other articles of personal use, the average weight of 25 pounds per bag was assigned. The total weight of this luggage was 350 pounds.

The weights of the members of the California State Polytechnic College football team were taken from the program of the game played with Bowling Green on October 29, 1960. The weights, as listed, were verified by college records to be accurate within five pounds.

The maximum allowable Super C-46F takeoff weight for the departure from Toledo Express Airport was 46,850 pounds. The Board estimates the actual weight at takeoff was 48,859 pounds, 1,759 pounds over the maximum gross weight of the aircraft and 2,009 pounds over the maximum allowable takeoff weight at Toledo.

In the investigation of this accident it was determined that no en route inspections were made of Arctic-Pacific by the FAA during the year of 1960. It was also revealed that neither the Operations nor Maintenance FAA Air Carrier Inspectors assigned to Arctic-Pacific had inspected the carrier during the previous eleven months of operation because of duties with other assigned carriers.

Analysis

An analysis of the facts and evidence surrounding this accident reveals that the tragedy occurred as a result of a premature liftoff of an overloaded aircraft from an airport where zero visibility in fog existed.

Examination of C-46 performance data for the takeoff distance required with a 5 knot headwind, at an elevation of 684 feet m.s.l., and a takeoff weight of 48,859 pounds, reveals that 2,750 feet of runway would be required to take off and climb to fifty feet. This is based on a normal takeoff under standard conditions.

Calculation of the weight and balance of this aircraft and comparison of these calculations with the two filed weight and balance manifests for the Albuquerque and Youngstown departures indicate the disregard Captain Chesher had for regulations. In each case the actual weight of the aircraft exceeded the listed weight and allowable takeoff weight for these airports.

In computing the weight and balance for this flight, using the weights of the passengers, the total weight of the cargo recovered, including the company material spares and the known fuel load, the weight is broken down in the following manner:

Passenger and crew	9,038 lbs.
Weighed baggage	1,470 lbs.
Unweighed baggage	350 lbs.
Company material	154 lbs.
Fuel (1,036 gals.)	6,216 lbs.
Oil (60 gals.)	450 lbs.
Basic weight of aircraft	<u>31,383 lbs.</u>
Total	48,961 lbs.
Less taxi and runup fuel used	<u>-102 lbs.</u>
Total takeoff gross weight at Toledo	48,859 lbs.

This weight distribution would have fallen within the c.g. limits of the aircraft even had the cargo been distributed in the most undesirable locations.

An analysis of the swerves described by the surviving passengers indicates that they were the pilot's efforts to maintain the aircraft on the runway while attempting to accelerate to V₂ speed and that he was experiencing difficulty with directional control. It is believed the pilot, upon recognizing his inability to maintain the aircraft on the runway, had to elect whether to abort the takeoff at this point or make a premature liftoff. The decision was made to continue and a premature liftoff resulted. The ensuing climb to an estimated altitude of 50 to 100 feet was probably made at an airspeed below V_{mc}. Several surviving passengers stated that once the aircraft was airborne it shuddered and while turning to the left descended rapidly and struck the ground. Based on witness statements that just prior to the crash there was a moment of silence, the Board believes that the pilot retarded his throttles before striking the ground. This is a normal reaction when a pilot realizes a crash is inevitable.

The testimony of weather personnel established that the weather conditions existing at the time of the accident were: zero visibility (less than 1/16th of a mile) in fog; sky partially obscured; temperature 39; dewpoint 39; wind from

the east-northeast at 5 knots. This condition existed for a period of 29 minutes prior to the takeoff of the aircraft. In fact, all regular air carriers operating at Toledo Express Airport had canceled all inbound and outbound flights as a result of poor visibility.

On the basis of the statements of the witnesses and the flightpath of the aircraft prior to final impact, it is obvious the left engine experienced a power loss of some magnitude, either because of some disorder, or because the throttles were retarded by the crew in an attempt to get back on the airport, or both. Since the engine examination revealed no mechanical failures, the most likely sources of engine maloperation would be the ground-fouled spark plugs, the disconnected intake pipe gland nut, and the prevailing weather conditions (particularly the moisture content in the air).

The adverse condition noted on the spark plugs of both engines was a moderate-to-heavy overlay of black carbon deposits on the insulator core noses. This condition is characteristic of long periods of ground operation at low power. When power is increased rapidly to the takeoff setting, the coating of carbon deposits on such plugs causes scattered plug firing with some power loss. These conditions would be evidenced by engine sputtering, roughness, and changes in exhaust rhythm as reported by various witnesses.

Investigation disclosed the engines were running approximately 24 minutes from the time of starting to the time of takeoff. It is obvious that the engines were ground-operated at low power for a considerable period of time, and this could have caused the ground-fouled condition. It is also obvious from the results of the tests that the majority of the plugs in both engines would have functioned normally had an engine burnout procedure been conducted just prior to takeoff.

The prevailing weather conditions at the time of the accident -- low temperature and high humidity -- could also be conducive to spark-plug fouling. Investigation conducted by engine manufacturers on the effects of humidity on power reveal that a portion of the dry air is replaced by water vapor in the atmosphere. This causes the normal fuel-air ratio to be enriched above the normal mixture strength, and, as a result, excessive richness and partial power loss occurs. Tests have indicated that a maximum of 12 to 14 percent power loss can occur at takeoff power with the mixture set at the auto-rich position during high humidity conditions. Based on the weather that existed at the time of the accident, a power loss of approximately 2 percent could have resulted from weather conditions alone.

The disconnected intake pipe gland nut could also have caused some power loss. It is obvious that the gland nut did not become disconnected at impact, particularly since it showed no damage, and the surrounding area was sooted. It is difficult to assess the amount of power loss which could result from such a discrepancy. The presence of a moderate coating of soot around the intake pipe and its adjacent areas is indicative of backfiring and partial power loss from cylinders Nos. 8 and 9 of the left engine.

The fact that the left engine was a model not currently certificated for use in the C-46 series aircraft had no direct bearing on the cause of the accident. However, the circumstances surrounding the installation of the R-2800-79 engine indicates the disregard the management of Arctic-Pacific had for established air-

worthiness compliance and adherence to the Civil Air Regulations. This is evidenced by the fact that Arctic-Pacific purchased the engine from a dealer in used metals; that Arctic-Pacific requested Newark Air Service to install the engine without furnishing the engine records; and that Arctic-Pacific knowingly permitted Newark Air Service to install and modify the engine knowing that Newark Air Service possessed only Class III Airframe and Limited Airframe repair station certificates.

Newark Air Service installed the engine as verbally requested by Arctic-Pacific's Director of Maintenance. Regardless of Newark Air Service's instructions from Arctic-Pacific, they failed to inspect the engine for airworthiness compliance as required by the Civil Air Regulations. The Chief Inspector of Newark Air Service testified that they were dubious of the airworthiness of the engine, particularly since there were no overhaul records with the engine. Nevertheless, Newark Air Service failed to bring this to the attention of the FAA.

Although the Civil Air Regulations do not specifically require en route inspections, the Manual of Procedures for the FAA Air Carrier Offices do set forth the requirement. The Board notes that no en route inspections were made by FAA of Arctic-Pacific in the year 1960.

Since the Operations Inspector assigned to Arctic-Pacific was not able to inspect this carrier during the previous eleven months of operation, it is difficult to understand why the appropriate persons in the local FAA air carrier office did not apprise their superiors of this condition. This is especially true since the volume of correspondence over discrepancies noted on ramp checks at Oakland International Airport and airports other than the home base indicated deficiencies in Arctic-Pacific's maintenance program. This was also attested to in the FAA action against Arctic-Pacific.

Because of the weather conditions at Toledo Express Airport, certain economic factors confronted Captain Chesher. Captain Chesher had the responsibility for 43 passengers as well as the crew. If the flight did not depart, as planned, Captain Chesher, as agent for the Arctic-Pacific, would have been obligated to furnish lodging, meals, and transportation for these passengers. It is possible that the economic situation may well have influenced his decision to take off.

Since this accident the FAA has instructed its tower operators to withhold takeoff clearance from an air carrier or other commercial aircraft operated for the purpose of carrying passengers or property for compensation or hire when the prevailing visibility for the airport of departure or runway visibility for the departure runway is less than one-fourth mile, or runway visual range is less than 2,000 feet.

The positions occupied by the flight crew at the time of the accident were established to be Copilot Perovich in the left seat and Captain Chesher in the right seat. Normally, under adverse weather conditions, it would be expected that the captain would be in the left seat and at the controls during the take-off under the weather conditions which prevailed. The aircraft can, however, be flown from either seat, and there is no possible way of establishing who was actually controlling the aircraft at the time of the accident. Although Copilot Perovich had over 3,200 flying hours, 1,300 of which were in C-46, held an airline transport pilot certificate, and was qualified as a copilot in C-46 aircraft, he did not possess a type rating in C-46 aircraft.

Although the accident occurred during the takeoff from Toledo Express Airport, which was to be the first flight on the return to Santa Maria, California, the Board made an extensive analysis of the total flying time, en route time, on-duty time, and rest periods from the time the chartered flight departed Oakland Airport, California. Four pilots were aboard the aircraft when it departed Oakland Airport but the second crew flew only the leg from Albuquerque, New Mexico, to Kansas City, Missouri, and left the flight at Kansas City. Captain Chesher was listed as pilot-in-command for the entire flight from Oakland.

Utilizing the arrival and departure times (as shown under Investigation), it was determined that both Captain Chesher and Copilot Perovich were on continuous duty from departure at Oakland Airport to arrival at New Haven, a total of 26:40 hours. During this period, Chesher and Perovich were actually at the controls of the airplane for 11:15 hours of the total 14:41 hours of flight time to New Haven, Connecticut. The remaining flight time of 3:26 hours was deadhead time between Albuquerque and Kansas City.

It is known that the crew had a layover of 29:10 hours in New Haven, Connecticut, prior to beginning the return trip. However, during the morning and afternoon on the day of the accident, Copilot Perovich spent some time at the airport at New Haven attending to servicing and preflight duties.

Since the return portion of the trip from New Haven to Oakland would have been flown under the same conditions, e.g., two-man crew to Kansas City and four-man crew to Oakland, in addition to being a slower westbound flight due to prevailing headwinds, it may be concluded that the entire projected return trip would also have been flown in direct violation of Civil Air Regulation 42.48, had the accident not occurred. ^{10/}

Conclusions

Captain Chesher was briefed on the weather conditions which were below his allowable minimums prior to departure. Visibility at time of takeoff was zero in fog. During takeoff from Toledo Express Airport the aircraft, with the copilot in the left seat, swerved to the right followed by a violent swerve to the left just before the aircraft left the ground. The liftoff was described as abrupt or as a lurch into the air, and was accomplished before reaching V₂ speed. The aircraft shuddered or vibrated (characteristic of a stall) just prior to entering a left wing-down, nose-low attitude. The crew removed power from both engines just prior to impact, which occurred approximately 5,800 feet from the threshold of runway 07.

^{10/} CAR 42.48(d) reads as follows:

"Aircraft having a Crew of Four Pilots.

"(1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours during any 24-hour period.

"(2) A pilot shall not be scheduled to be aloft for more than 16 hours in any 24-hour period.

"(3) A pilot shall not be on duty for more than 20 hours during any 24-hour period."

The Board believes that the loss of power caused by the maloperation of engines not properly runup immediately prior to takeoff and the swerving takeoff run due to erratic engine performance and poor visibility resulted in a premature liftoff. The pilot was unable to remain airborne due either to a stall condition or a loss of power or both. The wreckage being 5,800 feet down the runway indicates that the above-mentioned conditions caused a longer than normal takeoff run.

The Board concludes that Captain Chesher and the management of Arctic-Pacific Airlines displayed utter disregard for the regulations set forth as to flight time limitations, minimum weather conditions, proper completion and filing of required paper work, good maintenance and inspection practices, and for compliance with regulations concerned with ensuring operation, including maximum gross takeoff weight, in a manner to guarantee safety to the public.

As a result of this accident, the FAA has published a notice in the Airman's guide and has instructed its tower operators to withhold takeoff clearance from any air carrier or other commercial aircraft operated for the purpose of carrying passengers or property for compensation or hire when the prevailing visibility for the airport of departure or runway visibility for the departure runway is less than one-quarter of a mile, or runway visual range is less than 2,000 feet.

On October 31, 1960, the FAA suspended, in accordance with Section 609 of the Federal Aviation Act of 1958, the air carrier operating certificate issued to Arctic-Pacific. Subsequently, the operating certificate, which expired on November 14, 1960, was not renewed.

Probable Cause

The Board determines the probable cause of this accident was loss of control during a premature liftoff. Contributing factors were the overweight aircraft, weather conditions, and partial loss of power in the left engine.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ALAN S. BOYD
Chairman

/s/ ROBERT T. MURPHY
Vice Chairman

/s/ CHAN GURNEY
Member

/s/ G. JOSEPH MINETTI
Member

/s/ WHITNEY GILLILLAND
Member

S U P P L E M E N T A L D A T A

Investigation and Hearing

The Civil Aeronautics Board was notified of this accident immediately after occurrence. An investigation was immediately initiated in accordance with the authority of Title VII of the Federal Aviation Act of 1958. A public hearing was ordered by the Board and was held at Oakland, California, on February 1, 2, and 3, 1961. Depositions were also taken at Toledo, Ohio, on January 11, 1961, and at Miami, Florida, on February 24, 1961.

The Carrier

Arctic-Pacific, Inc., was a supplemental carrier, and incorporated in the State of Washington. It maintained its principal offices at the Oakland International Airport, Oakland, California. The corporation held a temporary CAB certificate of public convenience and necessity issued by the Civil Aeronautics Board to engage in the transportation of irregular passenger and cargo operations, and an FAA air carrier operating certificate which expired on November 14, 1960.

Flight Personnel

Captain Donald L. J. Chesher, age 38, was employed by Arctic-Pacific, Inc., in July 1957. He had been on a leave of absence from the company from the latter part of August 1960 until October 23, 1960, four days prior to the commencement of this series of flights. He possessed a valid FAA airman certificate with an airline transport pilot rating with airplane multiengine land, with Douglas DC-3 and Curtiss Wright C-46 type ratings. His first-class medical certificate with no limitations was dated August 3, 1960. He had accumulated a total of 6,364 flying hours.

Copilot Howard Perovich, age 30, was employed by Arctic-Pacific, Inc., in August 1960. He possessed a valid FAA airman certificate with an airline transport pilot rating for airplane multiengine land, and a Douglas DC-3 type rating. He also possessed an FAA mechanic certificate with airframe and powerplant ratings.

Hostess Susan Faith Miller had been employed by numerous air carriers and had a total of approximately 7,500 flying hours.

The Aircraft

Curtiss Wright Super C-46F, N 1244N, bore manufacturer's serial number 22458. The aircraft was leased by Arctic-Pacific, Inc., from the Barter Island Company, Spenard, Alaska. The aircraft was powered by Pratt & Whitney R-2800-B series engines. The left engine was a 79 model engine and the right engine was a 75 model engine. The aircraft was equipped with Hamilton Standard, model 23E50 propellers with model 6491A-6 blades.