

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted: April 21, 1955

Released: April 25, 1955

PETROLEUM HELICOPTERS, INC., GRAND ISLE, LOUISIANA,  
DECEMBER 2, 1954

The Accident

A Sikorsky helicopter, model S-55, N 737A, owned and operated by Petroleum Helicopters, Inc., crashed approximately 200 yards offshore in the Gulf of Mexico near Grand Isle, Louisiana, December 2, 1954. The accident occurred at approximately 0235<sup>1/</sup> during an attempt to land in heavy fog. Four of the five passengers perished as a result of injuries or drowning; one passenger and the crew of two received minor injuries. The aircraft was demolished by impact and fire that followed.

History of the Flight

N 737A departed the Grand Isle heliport at 0115 for the purpose of transporting oil drilling employees (who were working under a contract between Delta Gulf Drilling Company and the Humble Oil and Refining Company) to Grand Isle from an oil drilling rig located approximately six miles offshore. The crew consisted of Alvin D. Allen, pilot, and Richard F. Bicknell, copilot. After reaching the drilling rig, designated ST-6, a normal landing was made on a helicopter landing platform constructed on the deck of an LST anchored adjacent to the drilling rig. A normal waiting period took place for a shift change and the five returning employee-passengers to board the helicopter. At 0218 the flight departed for the Grand Isle heliport, a flight which normally required approximately 10 minutes. The flight took off on a west heading and made a right 90-degree turn toward the nearest shoreline, climbing to 1,000 feet m. s. l. At departure, lights located on other offshore rigs and on shore, varying between 6 and 10 miles away, were clearly visible but with a slight halo attributed to haze. This condition had existed throughout the entire night operation consisting of several other flights.

As the flight proceeded toward the shore vertical visibility steadily and rapidly decreased. Shore lights, dimly visible, were recognized and the flight turned right following the shoreline eastward toward the heliport. After reaching the landing area the hangar lights and a continuously burning oil residue flare (a shallow pit 15 feet in diameter burning oil, tar, and gas seepage), also located near the heliport, were visible only as a glow through the fog from an altitude of 500 to 600 feet. The flight passed over the heliport hangar and glow of the flare and made a 180-degree left turn. A letdown was started but during the descent visibility became worse and visual reference with the lights was lost. A pull-up was then executed to about 450 feet, which was the top of the fog layer.

<sup>1/</sup> All times herein are central standard and are based on the 24-hour clock.

An attempt to land, at the copilot's suggestion, on an unobstructed clearing near the hangar was abandoned when the hangar lights could no longer be seen and a second pull-up was made. At this time the pilot could no longer see lights in the area of the various offshore rigs. At 0232, immediately after this pull-up, the fuel warning light came on indicating 30 minutes (about 20 gallons) of remaining fuel. The pilot then decided to land on the clearing near the flare by approaching the flare from the east and using it as a ground reference through the fog. The helicopter was flown to the east of the area and a descent was started toward the flare with approximately 40 knots forward speed. The approach seemed normal until the pilot realized he was overshooting the flare. At this time considerable glare was reflected in the cockpit. The pilot asked the copilot to take over on the controls. Copilot Bicknell applied full power, noting an exaggerated nose-down but laterally level attitude on the pilot's gyro horizon instrument and that the altimeter was then indicating about 250 feet. Only a few seconds thereafter the aircraft struck the water.

Both crew members and one passenger were able to extricate themselves from the wreckage before fire started and spread to gasoline and oil on the surface of the water. Fire prevented them from approaching the wreckage to help the others and they swam to shore, guided by a light dimly visible through the fog.

### Investigation

Most of the wreckage of the helicopter was recovered from the Gulf. Examination revealed that at the time of impact the aircraft was nearly level both fore-and-aft and laterally, and was descending toward the water at an angle of approximately 35 degrees. Impact forces were severe in an upward and rearward direction. The fuselage was moderately telescoped and was broken off at station 206 located at the rear of the passenger cabin. The tail boom, together with the tail rotor and its shaft, remained generally intact. As a result of impact, wave action, and salvage operations the cabin and cockpit areas were nearly destroyed above the level of the passenger cabin floor. The entire wreckage revealed evidence of impact and fire damage; however, there was no evidence found of structural failure or fire damage prior to impact. Although the weight and balance manifests aboard the aircraft were lost, load computation and the seating arrangement indicated that the aircraft was loaded to a gross weight well under the maximum allowable of 7,200 pounds and that the load was properly distributed in relation to the center of gravity of the aircraft.

Examination of the powerplant and statements of the crew disclosed that no malfunction nor loss of power was experienced before impact and that all controls and instruments were functioning in a normal manner. The engine, a Pratt and Whitney R-1340, had been properly maintained.

At the time of the accident the flying operation of Petroleum Helicopters was varied and extensive in the United States, Panama, and South America. In the Grand Isle area it was a transportation service for oil and oil well drilling companies. The operation was confined to transporting personnel very short distances between Grand Isle and several offshore oil drilling locations. The service, a comparatively new method of transportation in the oil industry, was conducted to provide a fast and comfortable means of transportation on a regular and emergency basis, involving approximately 45 flights during a 24-hour period.

Investigation disclosed that the company employment standards for helicopter pilots were high and that training and supervision were continually conducted by the chief or assistant chief pilots to insure a safe operation. Company policy gave the pilot authority to discontinue or cancel a flight if conditions, in his opinion, made the flight inadvisable. The minimum weather conditions for VFR flights were established at ceiling 300 feet and visibility 1/2 mile. Other operating procedures and requirements provided that the acting copilot see that passengers were equipped with and wore life jackets and that the passengers took seats commensurate with the best loading pattern. The copilot also prepared required manifests and ascertained that seat belts were fastened before the flight. According to testimony these requirements had been met before the subject flight.

Refueling procedures used in the company's operation required that the helicopters be serviced with sufficient fuel for the next scheduled round trip flight in addition to a minimum of 30 minutes reserve fuel. Investigation revealed that the aircraft was so refueled prior to the subject flight; also, fire damage to the wreckage indicated that a considerable amount of gasoline and oil burned following impact.

Several witnesses substantiated the crew's statements that prior to the time of takeoff they could see shore lights and other offshore drilling rig lights which varied between 6 and 10 miles away. Stars were clearly visible. Witnesses offshore and at the heliport stated that at both locations fog formed very quickly soon after the flight departed.

Both crew members of the subject flight were well qualified and had received regular checks on company operating and emergency procedures for helicopters. Both also were first pilots and during daylight hours flew alone. At night, however, as a safety measure two pilots were required to operate the S-55 and the pilots traded the flight commander's position every other flight. Communications equipment installed in the aircraft, at the Grand Isle heliport, and at each offshore terminal provided continuous contact between the aircraft and any terminal on one fixed radio frequency. Operating procedures gave aircraft transmissions priority over any other messages.

At the present time helicopter flight characteristics have made instrument flight difficult under certain conditions, especially during the approach and landing configurations where low speeds are necessary. Although great progress has been made, the S-55 helicopter and others have not yet been certificated for commercial instrument operations. Therefore, Petroleum Helicopters did not intend that flights be made unless continuous visual ground reference could be maintained.

The weather conditions which existed at the time of the accident consisted of a cold front which extended east and west through northern Louisiana and which was moving slowly south until at 0030 on December 2 it was about 50 or 60 miles north of Grand Isle. The front separated a relatively dry polar marine air mass to the north and a moist tropical stable air mass to the south. Characteristic of the season, the inland water was colder than the Gulf water and night radiation cooled the land surfaces rapidly. As a result, the air near the surface was cooled to the dewpoint, whereas less cooling occurred in

the Gulf water. These factors, coupled with the stable air mass and light surface wind, produced fog along the land and the inland and coastal waters in the Grand Isle area ahead of the front.

Investigation disclosed that Petroleum Helicopters had no arrangements for obtaining aviation forecasts or advisories for their operation, nor were there any official weather observations available to them for the immediate Grand Isle area. The Humble Oil Company, however, had a contract with a commercial weather service located in New Orleans for obtaining marine weather information and forecasts twice daily, at 0630 and 1530. These advisories and forecasts were received by telephone and immediately made available to the helicopter company, and were posted in flight operations for the pilots. The commercial weather service also provided special weather information when they considered it pertinent.

The crew of N 737A stated that on the day of the accident they read the weather bulletins which indicated the possibility of patchy inland fog during the evening hours of December 1 and early morning hours of December 2. They also stated that because of the forecast they were especially observant of the haze condition prior to takeoff.

### Analysis

The fog which the flight encountered was undoubtedly variable in intensity and thickness and was drifted by the light northwest wind flow. It appears that the fog at Grand Isle formed in a light degree before the flight left ST-6 and that denser fog formed and moved in very rapidly during the flight. This situation and the accident that resulted showed the need for more frequent, more adequate, and detailed weather forecasts and advisories in Petroleum Helicopters' operation. The rapid formation of fog also vividly pointed out the need for some observation equipment to be located at Grand Isle so that conditions there can be constantly observed and indicated changes immediately recognized.<sup>2/</sup>

Upon reaching the Grand Isle landing area the crew found it covered by ground fog. (Flight characteristics and instrumentation thus far developed have not been adequate for helicopter instrument approaches and landings.) The situation therefore was an emergency for the crew of N 737A. Additionally, remaining fuel, although adequate for the company's normal operation, was insufficient for an extensive continuation of the flight. It is believed that in the emergency the crew should have called ST-6 by radio to make a positive determination as to whether or not the fog was existent there also. However,

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<sup>2/</sup> During the public hearing it was learned that Petroleum Helicopters, Inc., has ordered meteorological equipment for measuring wind direction and velocity, temperature, dewpoint, and barometric pressure. This equipment will provide some on-the-spot weather information in the Grand Isle area and especially aid in determination of conditions under which fog may result. The company will also obtain radio equipment so that it may receive CAA aviation weather broadcasts from New Orleans, which will be utilized in their offshore operations. They will install a TWX circuit from Lafayette for receiving forecasts and other information from CAA schedule "A" circuit.

evidence indicates that shortly after departure fog did reach that position and within the time required to make the return flight it would have been fog bound.

During the pilot's attempt to make a visual landing near the oil flare it is believed that he began to lose visual reference with respect to the attitude and position of the aircraft during the descent into the fog. As the aircraft passed over and beyond the flare the condition was aggravated by reflected glare and immediate darkness which followed. At this moment, without visual reference, the pilot lost control of the aircraft.

### Findings

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

1. The aircraft and crew were properly and currently certificated.
2. The aircraft was loaded to a weight well below the maximum allowable and the load was properly distributed in relation to the center of gravity of the aircraft.
3. At departure from ST-6 lights were visible between 6 and 10 miles away but with haze which had existed during the entire evening operation.
4. During the flight fog developed rapidly over the area from the surface to about 450 feet above the surface.
5. The S-55 type helicopter has not been approved for instrument flight.
6. Lack of weather equipment prevented timely anticipation of the fog.
7. There was no power or structural failure or other malfunction of the aircraft prior to impact.

### Probable Cause

The Board determines that the probable cause of this accident was the loss of visual reference caused by fog and glare, which resulted in a loss of control by the pilot during an attempt to land.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ROSS RIZLEY

/s/ JOSEPH P. ADAMS

/s/ JOSH LEE

/s/ CHAN GURNEY

/s/ HARMAR D. DENNY

## S U P P L E M E N T A L   D A T A

### Investigation and Hearing

The Fort Worth office of the Civil Aeronautics Board was notified of this accident by telephone at approximately 0445, December 2, 1954. An investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was ordered by the Board and was held at 301 Vermillion Street, Lafayette, Louisiana, on January 13, 1955.

### Operator

Petroleum Helicopters, Inc., a Delaware corporation, is engaged in helicopter transportation of drilling crews and equipment to and from offshore oil well drilling locations. The principal offices of the corporation are located at 3503 Fern Street, New Orleans, Louisiana. Petroleum Helicopters, Inc., conducts these operations under the provisions of Parts 43 and 60 of the Civil Air Regulations. Its aircraft are certificated by the Civil Aeronautics Administration.

### Flight Personnel

Alvin D. Allen, age 33, had been employed by Petroleum Helicopters since January 12, 1953. He held a currently effective airman certificate with commercial, helicopter, instrument, single- and multi-engine land airplane ratings. At the time of the accident he had approximately 2,100 hours' pilot experience in fixed-wing aircraft and 2,247 hours in Sikorsky, Bell, and Hiller helicopters. His last CAA physical examination was taken on August 13, 1954.

Richard F. Bicknell, age 29, had been employed by Petroleum Helicopters since August 1953. He held a currently effective airman certificate with commercial, helicopter, and single-engine land airplane ratings. His piloting experience at the time of the accident was 141 hours in fixed-wing aircraft and 1,597 hours in Sikorsky, Bell, and Piasecki helicopters. His last CAA physical examination was taken on May 17, 1954.

### The Aircraft

N 737A, a Sikorsky model S-55 helicopter, serial number 55785, was manufactured by Sikorsky Aircraft Division of United Aircraft Corporation, and had been in service with Petroleum Helicopters, Inc., for three months, having been purchased from the manufacturer on September 5, 1954. The aircraft was equipped with a Pratt and Whitney R-1340 engine. At the time of the accident total time on the aircraft was 360 hours, 25 minutes. The aircraft was currently certificated, all applicable airworthiness directives had been complied with, and maintenance was current. It was equipped to carry 10 passengers or equivalent cargo.

CIVIL AERONAUTICS BOARD  
Washington

December 6, 1954

TO: Messrs. Gurney, Denny, Ryan, Lee, Adams,  
The Executive Director

FROM: Director, Bureau of Safety Investigation

SUBJECT: Accident Involving Sikorsky S-55  
helicopter, N 737A, near Grand Isle,  
Louisiana, December 2, 1954

Sikorsky S-55 helicopter, N 737A, owned by Petroleum Bell Helicopter Company, crashed and burned in approximately 5 feet of water about 150 feet offshore from Grand Isle at 0215C, December 2. Four passengers were killed; Pilot R. F. Bicknell, Copilot A. D. Allen, and one passenger received minor injuries.

The helicopter was transporting oil workers from an offshore oil rig to Grand Isle, and a landing was being attempted during fog conditions. Preliminary investigation has disclosed no indication of engine or structural failure prior to impact.

Investigators Buckman and Carr of the Board's Fort Worth office are at the scene.

*W. K. Andrews*

W. K. Andrews

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CIVIL AERONAUTICS BOARD  
WASHINGTON, D. C.

UNITED STATES OF AMERICA  
CIVIL AERONAUTICS BOARD  
WASHINGTON, D. C.

(Desk # No. SA-297)

IN THE MATTER OF INVESTIGATION OF ACCIDENT INVOLVING  
AIRCRAFT OF UNITED STATES REGISTRY N 737A, WHICH OCCURRED  
NEAR GRAND ISLE, LOUISIANA, DECEMBER 2, 1954

NOTICE OF HEARING

Notice is hereby given, pursuant to the Civil Aeronautics Act of 1938, as amended, particularly Section 702 of said Act, in the above-entitled proceeding that hearing is hereby assigned to be held on Thursday, January 13, 1955, at 9:00 a.m. local time at 301 East Vermilion Street, Lafayette, Louisiana.

Dated at Washington, D. C., January 4, 1955.

  
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Presiding Officer



# CIVIL AERONAUTICS BOARD

WASHINGTON 25, D. C.

**FOR RELEASE:**

IMMEDIATE

January 6, 1954

CAB 55-1

## CAB SETS HEARING ON HELICOPTER ACCIDENT

The Civil Aeronautics Board today announced that it had set a hearing to determine the cause of an accident which occurred on December 2, 1954, involving a Sikorsky S-55 helicopter owned by Petroleum Bell Helicopter Company, which occurred near Grand Isle, Louisiana.

The aircraft crashed and burned in approximately 5 feet of water about 150 feet offshore from Grand Isle, resulting in fatal injuries to 4 passengers, and minor injuries to 1 passenger and the pilot and copilot. The helicopter was transporting oil workers from an offshore oil rig to Grand Isle, and a landing was being attempted during fog conditions.

The hearing will be held on January 13-14, at 9.00 a.m., local time, at 301 East Vermillion Street, Lafayette, Louisiana. The Board has named Robert W. Chrisp, Chief of the Hearing and Reports Division of the Board's Bureau of Safety Investigation, as presiding officer. He will be assisted by George M. French, meteorologist, also from the Board's Washington office, and Mr. J. F. Buckman, Investigator-in-charge of the Board's Fort Worth Regional Office.

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