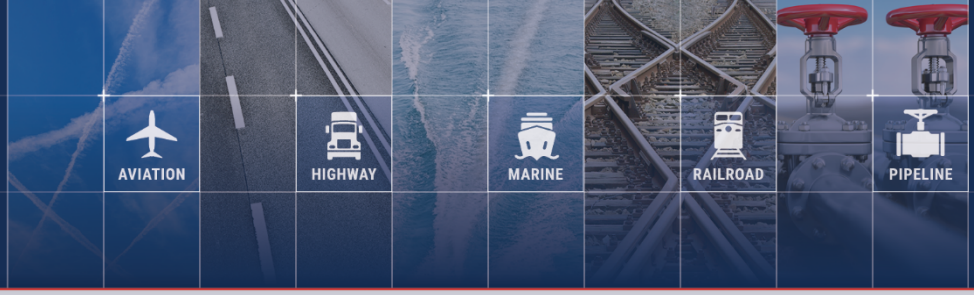

Aviation Investigation Final Report

Location:	LIBBY, Montana	**Accident Number:**	SEA94LA228
Date & Time:	September 1, 1994, 12:10 Local	**Registration:**	N165AC
Aircraft:	SIKORSKY S-64F	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

THE HELICOPTER WAS ON A MAINTENANCE TEST FLIGHT TO TEST A RETARDANT TANK SYSTEM THAT WAS USED TO CARRY AND DISPENSE WATER. AFTER ARRIVING AT A LAKE, THE FLIGHT CREW HOVERED THE HELICOPTER WHILE LOWERING THE SNORKEL TO ONLOAD WATER. HOWEVER, THE QUANTITY INDICATOR WAS MALFUNCTIONING, AND THE CREW MEMBERS WERE UNSURE IF WATER WAS BEING ONLOADED. THE PILOT OPTED TO FLY OUT OF THE HOVER AND DUMP THE WATER FROM THE RETARDANT TANK. AS THE FLIGHT BEGAN TO DEPART THE AREA, THE PILOT NOTED THAT THE HELICOPTER WAS LACKING RESPONSE TO THE COLLECTIVE AND THE RATE OF CLIMB WAS SLOW. WHEN THE WATER WOULD NOT DUMP FROM THE TANK, THE FLIGHT CREW TRIED TO JETTISON THE TANK. NEITHER SYSTEM WOULD WORK. THE ROTOR RPM BEGAN TO DECREASE AND THE HELICOPTER SETTLED INTO THE WATER AND SANK. DURING AN INVESTIGATION, NO MECHANICAL FAILURE OR MALFUNCTION OF EITHER ENGINE WAS FOUND. WHEN CHECKED, THE RETARDANT (WATER) QUANTITY INDICATOR SYSTEM WAS INOPERATIVE AND WOULD ONLY SENSE THAT THERE WAS NO WATER IN THE TANK. TO RELEASE WATER, THE SYSTEM NEEDED TO SENSE THAT THERE WAS ENOUGH WATER FOR THE SELECTED SETTING; THEREFORE, THE TANK DOORS WOULD NOT OPEN TO DUMP WATER WITH THIS MALFUNCTION. NO EVIDENCE WAS FOUND TO DETERMINE WHY THE EMERGENCY TANK DROP SYSTEM DID NOT FUNCTION. USING ESTIMATES, PERFORMANCE DATA INDICATED THE HELICOPTER WAS ABOVE THE MAXIMUM GROSS WEIGHT AND WAS POWER LIMITED FOR THE ENVIRONMENTAL CONDITIONS. ELEVATION OF THE LAKE WAS ABOUT 6500 FEET; AIR TEMPERATURE WAS ABOUT 63 DEGREES.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

THE FLIGHT CREW ALLOWED THE HELICOPTER'S WEIGHT AND BALANCE TO BE EXCEEDED, AND THE EXTERNAL LOAD (TANK) JETTISON SYSTEM FAILED TO OPERATE. A FACTOR RELATED TO THE ACCIDENT WAS: THE FALSE INDICATION ON THE RETARDANT QUANTITY INDICATOR.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings
1. (F) AERIAL APPLICATION EQUIPMENT - FALSE INDICATION
2. (C) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
3. AIRCRAFT PERFORMANCE,CLIMB CAPABILITY - EXCEEDED
4. LOAD JETTISON - NOT POSSIBLE
5. (C) EXTERNAL LOAD RELEASE SYSTEM - INOPERATIVE
6. TERRAIN CONDITION - WATER

Factual Information

On September 1, 1994, approximately 1210 mountain daylight time (mdt), a Sikorsky S-64F helicopter, N165AC, registered to and operated by Erickson Air Crane Company, and being flown by Gary M. Wiltrout and Jimmy R. Tipler, two commercially certificated pilots, was destroyed when the aircraft settled into Hanging Flower Lake, while in a hover, seven nautical miles southwest of Libby, Montana. The pilot-in-command was not injured, however, the co-pilot and the crewman received minor injuries. Visual meteorological conditions prevailed and no flight plan had been filed. The flight, which was a maintenance check flight, was to have been operated in accordance with 14CFR91, and originated from the Libby Airport, Libby, Montana, at 1200 hours.

In a written statement, the pilot reported that a retardant tank had been installed on the helicopter the previous day. Also at the conclusion of the flight on the previous day, the pilot stated that the number two engine had failed. A fuel control unit was changed which required a power check adjustment before the next flight. After the power adjustment was completed, the pilot did a control check on the retardant tank and found that the snorkel pump was not operating, however, the emergency dump system was operational. The isolation valve was found to be the problem and it was corrected.

The flight then departed for the required test flight to Hanging Flower Lake where the tank system could be tested. The pilot stated that the flight to the lake was uneventful and the engines were performing normally. When the flight arrived at the lake, the pilot hovered the helicopter down until the snorkel was submerged in the water. The pump was turned on and the pilot asked the crewman if water was being taken on. The co-pilot stated that the quantity indicator was erratic and he was unsure if they were taking on water, however, the crewman stated that he thought that they were as he saw water leaking from around the top of the snorkel hose. After approximately 15 seconds, the pilot pulled the helicopter up into a 20 foot hover with very little power required. The pilot felt that they probably did not take on very much water. The pilot stated that he then hovered back to the water and again submerged the snorkel for another 15 seconds. The pilot was unsure if they were taking on water and decided to pull up and check the system by dumping the water. The pilot stated that as he was departing the area, it did not feel like the helicopter was responding to the collective setting and the rate of climb was slow. The pilot attempted a momentary drop of the water by using the collective dump button, however, there was no indication that any water dumped. At this time the pilot asked the co-pilot how the power was and the co- pilot responded that they were losing rotor RPM and that they were also going to lose the generators. The pilot realized that they would not clear nearby trees and started to slide the helicopter to the right over the lake. The pilot tried to jettison the tank but stated that the tank would not jettison as the helicopter descended and touched down lightly on the surface.

The helicopter then hovered back to five feet above the water, then began to settle back into the water. As the helicopter made contact with the surface, it rolled to the left and sank.

After the helicopter was retrieved from the lake and secured, the engines were examined. During the teardown inspection, there was no evidence found to indicate a mechanical failure or malfunction. (see attached Investigation of the Crash of N165AC).

The emergency load release system was inspected and found that the quantity indication system was inoperative, therefore the fire tank doors would not open to release water. The emergency tank drop system was inspected and tested and found to be operational. The emergency drop hydraulic valve tested normal both electrically and hydraulically, however, it was suspected that the dump valve was unreliable.

Further study into the environmental conditions at the time of the accident (i.e. 6,000 feet and 10 degrees C), the estimated loading of the helicopter with remaining fuel, and the estimated amount of water added during the snorkel pump test, it was determined that helicopter was operating above maximum gross weight. It was also noted that the performance data available for this make and model helicopter is limited, and that estimates were used. Company personnel were using performance data from another make and model helicopter similar to the accident helicopter. This helicopter was found to be power limited for this operation.

Pilot Information

Certificate:	Commercial	**Age:**	46,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	February 23, 1994
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	13500 hours (Total, all aircraft), 1800 hours (Total, this make and model), 12000 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 80 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	SIKORSKY	**Registration:**	N165AC
Model/Series:	S-64F S-64F	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	64085
Landing Gear Type:	Tricycle	**Seats:**	3
Date/Type of Last Inspection:	August 30, 1994 Continuous airworthiness	**Certified Max Gross Wt.:**	47000 lbs
Time Since Last Inspection:	16 Hrs	**Engines:**	2 Turbo shaft
Airframe Total Time:	1724 Hrs	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	JFTD12-5A
Registered Owner:	ERICKSON AIR CRANE COMPANY	**Rated Power:**	4800 Horsepower
Operator:		**Operating Certificate(s) Held:**	
Operator Does Business As:		**Operator Designator Code:**	JYDL

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	17°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	, MT (S59)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Minor, 1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor, 1 None	**Latitude, Longitude:**	48.319698,-115.360557(est)

Administrative Information

Investigator In Charge (IIC):	Mccreary, Steven
Additional Participating Persons:	LEO WADEKAMPER; HELENA , MT
Original Publish Date:	September 24, 1995
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42013