Aviation Safety Investigation Report 199303718

Bell Helicopter Co Longranger

10 November 1993

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Aviation Safety Investigation Report

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Occurrence Number: 199303718 **Occurrence Type:** Accident
Location: 142km WNW Burketown
State: QLD **Inv Category:** 3
Date: Wednesday 10 November 1993
Time: 0945 hours **Time Zone** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	1	1	0	0	2
Total	**2**	**1**	**0**	**0**	**3**

Aircraft Manufacturer: Bell Helicopter Co
Aircraft Model: 206L-1
Aircraft Registration: VH-ECT **Serial Number:** 45166
Type of Operation: Miscellaneous Other
Damage to Aircraft: Destroyed
Departure Point: 13km E Camp Ridgeway QLD
Departure Time: 0945 EST
Destination: 18km E Camp Ridgeway QLD

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL 1st Class	1200.0	5100

Approved for Release: Monday, September 19, 1994

FACTUAL INFORMATION

Background

The aircraft was engaged in providing support to a mineral exploration operation. The operation required that the drilling rig be disassembled by attaching the various components to the sling of the helicopter and lowering them to the ground. The rig, associated equipment and personnel were then transported to the new site where the rig was reassembled by using the helicopter to lift the rig components into position.

The drilling rig was operated by the company owner, a driller, and two assistants. The driller had previously used a helicopter in operations to disassemble, transport and reassemble the rig. Neither of the assistants had been involved with the use of helicopters in drilling operations. One of the assistants had practised assembling and disassembling the rig at the driller's base with the use of a crane. The other had no previous experience with this type of drilling rig.

Sequence of Events

Earlier in the day the helicopter had been used to transport personnel to the drilling site (T9) from the base camp. It had later flown to a fuel dump and carried a drum of fuel, as an externally slung load, to the next site to be drilled. At this site, the pilot added approximately 30 litres of fuel to the aircraft, removed the sling and net from the external attachment point and stowed them in the cabin of the aircraft. The aircraft was then flown to T9 from where personnel and equipment were to be transported in preparation for the re-location of the rig to the new site.

At site T9, the pilot remained in the helicopter with the engine operating while the other personnel loaded two batteries and two drill hammers onto the floor of the cabin area. The assistant who was to travel on the helicopter to the next site attached the sling to the external attachment point. The driller and the assistant then boarded the helicopter. They were seated in the cabin opposite each other with one facing forward and the other rearward.

The helicopter then lifted off and, just after commencing forward flight, the end of the sling momentarily contacted the engine of the drilling rig. The sling was flung upward and struck the helicopter. As a result, a metre long section of the tip end of one main rotor blade was severed. A main rotor blade then struck the forward right side of the cockpit area, fatally injuring the pilot. The tailboom of the helicopter was severed by the damaged main rotor blade and the helicopter fell to the ground, landing on its left side. Two persons on the ground assisted in evacuating the passengers. One of them remained at the site to assist the passengers and the other walked the considerable distance to the base camp to obtain assistance.

Operational and Briefings Aspects

The helicopter operator's operations manual required that the pilot be qualified on sling operations prior to this type of operation being undertaken. The manual also required that the pilot brief all personnel involved in the sling operation prior to commencement.

On this occasion, because both the pilot and driller received fatal injuries, it was not possible to determine the extent of the briefing between the two men. However, the assistants reported that their briefing covered two aspects only; the method of approaching the helicopter when the rotors were turning and the method of manipulating the sections of the drilling rig while they were attached to the sling on the helicopter.

The assistant who attached the sling to the helicopter stated that he had not been instructed on how to complete the task. When he attached the sling, the pilot waved him away. The assistant assumed that this was because he was attaching the sling from the wrong direction. He then moved around the helicopter and attached it from a different direction. Thus he believed that the pilot was aware that the sling was attached to the helicopter. Whether the pilot was aware the sling was attached and forgot about it during the takeoff or believed that the sling was not attached is unknown. The helicopter was not fitted (nor was it a requirement) with any device that would allow the pilot to ascertain the presence of a sling or the condition of the load on the sling.

Communications and Search and Rescue Aspects

The aircraft was fitted with an Emergency Locator Beacon (ELB) which was not activated during the accident sequence. The beacon was located on the centre pedestal of the cockpit and positioned so that it was inclined downward. The operation selector was in the 'Armed' position and a subsequent functional check found that the ELB was serviceable and capable of operation.

The ELB was of the type that is fitted with a single gravity activation switch and the method of mounting it on the pedestal was calculated to allow activation for vertical and forward impacts (those most likely as a result of helicopter accidents). On this occasion the helicopter landed on its left side and the gravity switch was not activated.

No communications network had been set up between the base camp, the helicopter or each drilling site. As a result, there was no provision to either allow the persons at T9 to call for assistance or to alert those at other sites of a potential problem when a schedule was missed. Also, no one at T9 was aware that the ELB could have been manually activated, thus gaining the assistance of other aircraft in the area. The end result of the lack of a communication network was that a person was required to walk out of the site to obtain assistance.

CONCLUSIONS

Findings

The pilot was correctly licenced and experienced in the type of operation being conducted.

The aircraft was serviceable prior to the occurrence.

The driller had previously conducted similar operations using the support of a helicopter.

Neither of the driller's assistants had experience working with helicopters.

The external sling was attached to the helicopter by one of the driller's assistants.

The pilot could not visually confirm whether or not the external load sling was attached.

It could not be determined whether the pilot was aware that the sling was attached to the helicopter.

The pre-operation briefing given to the two drillers assistants was inadequate.

A metre long section of one main rotor blade was severed by impact with the sling.

The Emergency Locator Beacon was serviceable and 'armed' prior to the occurrence.

The Emergency Locator Beacon was not activated by the impact.

No communications network had been set up between any section of the operation.

Persons involved in the operation at site T9 were not aware of how to operate the Emergency Locator Beacon.

Significant Factors

The briefing, by the pilot, of all those involved in the operation was inadequate.

The helicopter was not fitted with a mirror to enable the pilot to visually confirm the status of the external load sling hook.

SAFETY ACTION

As a result of the investigation the Bureau of Air Safety Investigation issues the following recommendation and safety advisory notices:

1. Recommendation R940190

Summary of Deficiency

A search of the BASI data base revealed that nine accidents involving sling operations had occurred in the past nine years. Of these, six may have been directly related to the pilot being unaware of the presence of a sling or the condition of the winch load.

Regulations relating to sling load and winching operations with helicopters do not require a device to be fitted to allow a pilot to ascertain the status of the sling and load. Additionally, there are no minimum equipment requirements for sling operations specified in Civil Aviation Orders.

Many operators have documented their own requirements relating to minimum equipment for sling/load operations.

Recommendation

The Bureau of Air Safety Investigation recommends that the Civil Aviation Authority:

(i) Review the legislation relating to sling load and winching operations with particular emphasis given to the minimum equipment requirements and the benefits associated with a load checking device, such as a mirror;

(ii) Consider producing effective educational documentation that addresses the issues that pilots and operators should consider in these types of operations.

2. Safety Advisory Notice SAN 940192

Summary of Deficiency

The Civil Aviation Authority is introducing the mandatory carriage of ELTs complying with the US FAA Technical Standard Order 91a (TSO 91a) which comes into effect in July 1995. This does not fully take into account the unique flight characteristics of helicopters.

ELTs with multi-axis gravity switch activation complying with TSO 91a are now available for purchase by operators.

Safety Advisory Notice

The Bureau of Air Safety Investigation suggests that in conjunction with the introduction of the mandatory carriage of ELTs complying with TSO 91a, the Civil Aviation Authority consider introducing a requirement for only multi-axis gravity switch activated ELTs to be fitted to helicopters.

3. Safety Advisory Notice SAN 940194

Summary of Deficiency

Anecdotal evidence collected by the investigation team suggests that it is not unusual for employees to be set down at remote sites with no way of communicating with either their company or outside help.

In the event of an emergency, personnel on the ground at the remote site must either walk out of the site or wait for help to arrive. In cases that are time critical neither of these methods would appear satisfactory.

Safety Advisory Notice

The Bureau of Air Safety Investigation suggests that the Queensland Department of Minerals and Energy, the Mining Industry Standing Committee and The Australian Mining Industry Council consider introducing a minimum acceptable standard of communication between all facets of remote operations as well as setting up a contingency plan for emergency situations at such sites. It is also suggested that these organisations consider implementing education programs for personnel involved in these types of operations.