

Lightship A-60, I-TIRE

AAIB Bulletin No: 2/2001

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Aircraft Type and Registration: Lightship A-60, I-TIRE

No & Type of Engines: 2 Limbach L-2000 piston engines

Year of Manufacture: 1992

Date & Time (UTC): 29 August 2000 at 1006 hrs

Location: Wolverhampton Business Airport

Type of Flight: Post maintenance test flight

Persons on Board: Crew - 2 - Passengers - None

Injuries: Crew - None - Passengers - N/A
Groundcrew - 1 Serious

Nature of Damage: None

Commander's Licence: Commercial Pilot's Licence (Airships)

Commander's Age: 36 years

Commander's Flying Experience: 2,700 hours (of which 1,140 were on type)
Last 90 days - 220 hours
Last 28 days - 64 hours

Information Source: AAIB Field Investigation

The Lightship A-60

The Lightship is designed specifically for marketing and aerial observation purposes. Advertising is on two 90 by 20 foot banners and the entire hull can be internally illuminated. It displaces 68,000 cubic feet, is 128 feet long, 33 feet in diameter and 44 feet high. It is cigar shaped, has cruciform tail fins and a gondola which is suspended about 40% of the length aft of the bow. The gondola has seating for 1 pilot and 4 passengers and is fitted with a single, pivoting landing gear. There is a rail round the lower part of the gondola for ground handling.

The engines are located on either side of the rear of the gondola and each drives a 60 inch diameter pusher propeller; the propeller does not have a protective guard. Under normal conditions, with the landing gear on the ground, the propeller/ground clearance is 25³/₄ inches.

Ground handling

The Ground Handling Crew (GHC) acts as a team under the direction of a Crew Chief. In winds less than 15 kt the minimum GHC is:

1 Crew Chief

4 Line Runners - 2 on each bow line

2 Car Party - 1 either side of the gondola

The GHC form a 'V' aligned with the wind and with the open end towards the Lightships approach. The Crew Chief, at the point of the 'V', raises a handheld windsock to indicate to the pilot that the GHC is ready. The Lightship slowly approaches the GHC, normally with the left engine shutdown and the right at idle, aiming to deliver the airship to the crew at a ground speed of not more than 10 kt. On the Crew Chief's command the Line Runners move in to take hold of their respective bow lines. They then move outwards and in the direction of movement of the Lightship and take the strain to arrest the forward movement. As the Lightship slows, normally to a groundspeed of about 5 kt, the Car Party move in and seize the handrail around the gondola to stabilise it.

History of the event

The GHC member who was injured reported that she had worked from 1530 hrs to about 2330 hrs on the day prior to the accident. She went to a hotel for the night and she estimated that she was asleep by about 0030 hrs. The following morning she was called at 0300 hrs and arrived at the airfield at about 0400 hrs to get the Lightship out of the hangar and prepare it for flight. At about 0600 hrs, she went back to the hotel and managed about 2 hours sleep before returning to the airfield at 0900 hrs to participate as Car Party for the return of the Lightship from its post maintenance test flight.

The surface wind was 090°/6 kt and the mooring mast had been positioned in the southwest corner of the airfield. The Lightship carried out a normal approach with the left engine shutdown. The GHC 'V' was positioned at the touchdown end of paved Runway 04 with the member who was injured ready to move to the gondola's right handrail. When instructed by the Crew Chief, she ran forward towards the gondola and, in the process of grabbing the handrail and turning right to run with it, she tripped and fell onto her back. The Lightship's right engine passed over her and the propeller tip struck her right ankle when her foot had involuntarily gone upwards as she landed.

Almost immediately, at 1006 hrs, the pilot reported the accident to the FISO who alerted the AFS. They went to the scene and were assisted by a Doctor who was on board an aircraft which was taxiing to take off. Both an Air Ambulance and a local Ambulance arrived at the airfield and the casualty was taken to hospital in the latter, at about 1028 hrs. She was found to have sustained a broken ankle.

Human factors

The GHC member had been with the company since May and had received 'on the job' training with various GHC combinations. As is normal, she started handling as a Line Runner and graduated to the Car Party. She is about 5 foot 11 inches tall and the hand rail was at about waist height. She participated in about 10 landings as Car Party but stated this landing had been faster

than any she had previously experienced. Although the company's Operations Manual lays down a formal basis for GHC training, it appears that the implementation was less formal.

She said that she felt particularly tired that morning, as a consequence of the previous day's activities and the short night rest. Although she normally wore appropriate boots, they had got wet and so she was wearing trainers instead.

Manufacturer's comment

The Lightship was manufactured in the USA and the Manufacturer assisted the AAIB in the investigation. To their knowledge, the A-60 has over 100,000 flight hours and this was the first accident of this type they had been made aware of. Although some Airships, especially those with tractor propellers, do have propeller guards there are no regulatory requirements for these to be fitted. They pointed out that there are performance and weight penalties and there is a particular problem of designing a guard which could withstand ground contact when an Airship rolls on the mooring mast.

The Manufacturer issued an FAA approved Ground Handling Manual which included Safety Precautions, some relevant to this accident, which it emphasised "must be observed constantly during all applicable phase of the ground handling/mooring process".