



## Brief of Accident (Continued)

LAX01FA071  
File No. 17180

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01/09/2001

Oakland, CA

Aircraft Reg No. N819AC

Time (Local): 13:30 PST

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the low nose condition, he added more power and placed the joystick (flight control system) to the full aft position to raise the nose. The instructor stated that he needed full aft on the joystick to keep the nose up, and any movement forward resulted in an immediate drop of the nose. He realized the flight controls were malfunctioning, but due to the low altitude, high airspeed, deteriorating weather, and the need to get the airship on the ground, he did not have time to accomplish the complete emergency procedure for a flight control malfunction. The airship landed very hard at a fast forward airspeed and with a very heavy nose. The landing gear collapsed and the gondola dug into the ground. The airship then skidded across an adjacent taxiway and struck a parked airplane. Both pilots jumped out on opposite sides of the gondola and pulled the emergency envelope deflation ripcords but the deflation panels did not open. The airship took off, unmanned, and reached a peak altitude of 1,600 feet above ground level (agl). The airship traveled for about 4 miles in a northeast direction and struck a marina where the envelope became draped over sailboats and a restaurant. The FAA approved flight manual was reviewed. It contained no specific emergency procedure for a stuck ballonet valve condition; however, in the emergency procedures section under "Pressure Related Emergencies" the text said that with a high pressure indication the pilot should check that the helium release valves and air valves are in the UNLOCKED position. The approved flight manual did not address added weight to the airship due to environmental conditions (rain). Placement of the forward ballonet was not symmetrical in relation to the rear ballonet as required by the design requirements of 14 CFR Part 21.17b. The forward ballonet also had a greater capacity than the rear ballonet. The conditions of the aft ballonet valves in the OPEN position and the fan for the forward ballonet in the ON position, allowed the forward ballonet to become fully inflated, which caused an out-of-trim/unequal hull pressure condition. The airship design with a more forward ballonet placement exacerbated the severity of the nose heavy condition after the valve failures induced the pressure/trim imbalance. A review of the airship design certification revealed that it had been certificated without consideration to advertising banners being draped over the rapid envelope deflation emergency ripcords, or to the effects of rain on the banners. The emergency ripcord deflation system was never tested on the airship in various environmental conditions, only on a mock-up in a hangar. Due to structural damage sustained in the impact sequence the airship systems could not be tested as installed on the airship. However, each individual system was functionally tested with no malfunctions noted. There was no Minimum Equipment List (MEL) for the airship and if a component was inoperative, the airship was considered to be in an un-airworthy condition. The dual ballonet level cockpit indicator had been taped over and marked "IN-OP" before this flight.

Brief of Accident (Continued)

LAX01FA071  
File No. 17180                      01/09/2001                      Oakland, CA                      Aircraft Reg No. N819AC                      Time (Local): 13:30 PST

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Occurrence #1:     AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION  
Phase of Operation: APPROACH

Findings

1. (C) BLIMP/AIRSHIP,GAS/AIR PRESSURE/FLIGHT CONTROL SYS - JAMMED
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Occurrence #2:     LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: APPROACH

Findings

2. WARNING SYSTEM(OTHER) - INOPERATIVE
  3. (F) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - INTENTIONAL - FLIGHTCREW
  4. (F) BLIMP/AIRSHIP,ENVELOPE/HULL - OUT OF BALANCE
  5. (F) ACFT/EQUIP,INADEQUATE DESIGN - MANUFACTURER
  6. (F) INADEQUATE CERTIFICATION/APPROVAL,AIRCRAFT - FAA(ORGANIZATION)
  7. (F) INSTRUCTIONS,WRITTEN/VERBAL - NOT ISSUED - MANUFACTURER
  8. (F) CONDITION(S)/STEP(S) NOT LISTED - MANUFACTURER
  9. (F) EMERGENCY PROCEDURE - MISJUDGED - PILOT IN COMMAND
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Occurrence #3:     IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

Findings

10. TERRAIN CONDITION - GROUND
11. OBJECT - AIRCRAFT PARKED/STANDING
12. OBJECT - BUILDING(NONRESIDENTIAL)

Findings Legend: (C) = Cause, (F) = Factor

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The National Transportation Safety Board determines the probable cause(s) of this accident as follows.  
the rear air relief valves stuck in an open position for an undetermined reason. A factor in the accident was the design and placement of the forward ballonnet envelope contrary to certification requirements, which exacerbated the out of trim condition resulting from the stuck air relief valve. Other factors were the absence of an appropriate emergency procedure for flight in an out of trim/unequal hull pressure condition, the pilot's misdiagnosis of the emergency condition, and his failure to activate (unlock) the helium release valves. FAA certification of the design when certain elements did not meet regulatory requirements and the decision by the crew to fly the airship with an inoperative ballonnet indicators were also factors.