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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: October 27, 1982

Forwarded to:

Honorable J. Lynn Helms
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-82-143 and -144

On September 30, 1982, a Robinson R-22 helicopter, N90637, crashed near Paige, Texas, while on a flight from Houston to Austin, Texas. The pilot sustained fatal injuries. Investigation by the National Transportation Safety Board revealed that a main rotor blade had struck the tailcone of the helicopter when the pilot initiated an evasive maneuver to avoid striking electric power lines. The tailcone separated and the helicopter descended uncontrollably to the ground.

Only 5 days earlier, on September 25, 1982, another Robinson R-22 crashed in Nashville, Tennessee, after a main rotor blade severed the tailcone during flight. There were two fatalities. On October 7, 1982, a third Robinson R-22 crashed in Orange County, California; the accident resulted in one fatality. In the latter accident, the main rotor mast was severed due to excessive pounding of the teetering main rotor system on its stops. Although all three investigations are continuing, currently there is no evidence to indicate that any unusual condition or damage existed before the initiation of the accident sequence. A common factor in these three accidents appears to be the loss of main rotor rpm during flight.

Title 14 CFR 27.661, Rotor Blade Clearance, specifies that there must be enough clearance between the rotor blades and other parts of the structure to prevent the blades from striking any part of the structure during any operating condition. The manufacturer and Federal Aviation Administration (FAA) certification personnel indicate that a main rotor blade of the Robinson 22 cannot intersect the helicopter structure during flight unless the main rotor speed has decayed below 50 percent of its normal operating rpm. Therefore, the Safety Board is concerned that the main rotor rpm decay rate may be such that a pilot does not have enough time to take the proper action to recover the decreasing rpm once the decay of rpm has begun. The Safety Board is aware that the FAA has initiated additional flight testing and analytical studies of the Robinson R-22 helicopter's main rotor system to examine its stability and stall characteristics. We believe that these actions should be pursued vigorously and that the aircraft should be restricted from further flight until the stability of the main rotor system is validated.

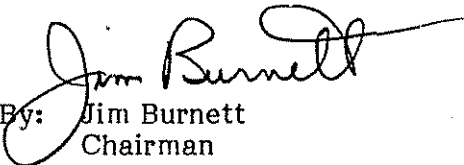
The Safety Board recognizes that relatively low-time pilots have been involved in at least two of the accidents. However, this helicopter is marketed as an entry level aircraft; in our view its margins of safety must take into account the fact that the aircraft frequently will be flown by inexperienced pilots.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Suspend the airworthiness certificate of the Robinson R-22 model helicopter until (1) the main rotor system stability/stall characteristics and the main rotor rpm decay rates are determined to provide adequate margins of safety and to be compatible with normal pilot reaction times, and (2) the R-22 main rotor system is determined to be in compliance with 14 CFR 27.661. (Class I, Urgent Action) (A-82-143)

Conduct a study to verify that adequate engine torque is available to the Robinson R-22 model helicopter main rotor system to recover rpm should a rapid decay of rpm occur during flight. (Class I, Urgent Action) (A-82-144)

BURNETT, Chairman, GOLDMAN, Vice Chairman, McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations.


By: Jim Burnett
Chairman