



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: April 14, 2010

In reply refer to: A-10-60 and -61

The Honorable J. Randolph Babbitt
Administrator
Federal Aviation Administration
Washington, D.C. 20591

During recent investigative testing, the National Transportation Safety Board (NTSB) learned that a failure within a helicopter's radio altimeter system could prevent the look-ahead feature of a Honeywell MK XXII Enhanced Ground Proximity Warning System (EGPWS) from functioning during flight and that the pilot would possibly be unaware that this feature within the system is not operational. The look-ahead feature provides visual and aural terrain avoidance alerts by comparing the aircraft's projected flightpath to a database containing terrain and obstacle information. The absence of these alerts, when the pilot does not know the alerts are not functioning, could mislead the pilot thereby significantly reducing the safety of flight.

Honeywell's MK XXII EGPWS is designed to be used on helicopters equipped with a radio altimeter.¹ Radio altimeters are designed to be accurate within specific altitude ranges. When a radio altimeter is operating outside of the design limits, the output signal becomes invalid and the associated sign/status matrix identifier is labeled "no computed data" (NCD). However, faults in the radio altimeter system may also result in the output signal being labeled NCD.

A valid altitude signal from the radio altimeter is required for the EGPWS to recognize that the helicopter is in the air.² This in-air recognition is required to enable the look-ahead feature of the EGPWS. If a radio altimeter system fault results in the radio altimeter transmitting a signal labeled NCD at the time the helicopter transitions from ground to air, the look-ahead feature of the EGPWS will not be enabled and the pilot will not receive any warnings that this important safety feature is not functional.

The NTSB is concerned that a radio altimeter transmitting an NCD signal during the helicopter's transition from ground to air could prevent the EGPWS look-ahead feature from

¹ A radio altimeter determines the aircraft's height above terrain by transmitting a radio signal and measuring the time it takes for that signal to reflect off the earth's surface and return to the aircraft.

² A valid altitude signal is a signal containing a sign/status matrix identifier of "normal."

operating and that the pilot would not receive an alert that the look-ahead feature and associated terrain avoidance alerts are not functional.

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

Require Honeywell to revise the software logic within the MK XXII Enhanced Ground Proximity Warning System so that a fault in the radio altimeter system would not prevent the look-ahead feature from functioning without notification to the pilot. (A-10-60)

Once Honeywell revises the MK XXII Enhanced Ground Proximity Warning System (EGPWS) software logic (as described in Safety Recommendation A-10-60), require all operators using the Honeywell MK XXII EGPWS to install the revised software. (A-10-61)

In response to the recommendations in this letter, please refer to Safety Recommendations A-10-60 and -61. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman HERSMAN, Vice Chairman HART, and Member SUMWALT concurred in these recommendations.

[Original Signed]

By: Deborah A.P. Hersman
Chairman