



Interagency Aviation Safety Alert



No. IASA 11-03

Date: June 10, 2011

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Subject: Helicopter Loss of Tail Rotor Effectiveness

Area of Concern: Helicopter Performance

Distribution: All Helicopter Activities

Discussion: On Friday, June 3, 2011, a Bell 407 with three people on board experienced a Loss of Tail Rotor Effectiveness (LTE) while flying a fire reconnaissance mission in mountainous terrain. The aircraft was operating at a **density altitude greater than 11,000 feet at 125-150 feet above the terrain and between 40-45 knots airspeed when the pilot initiated a 180 degree turn to the right.** During the turn the aircraft experienced turbulent winds and began to “sink”. When the pilot added power and left pedal to arrest the rate of descent the pilot was unable to control the aircraft heading and stop the right turn. After two 360° turns the pilot slightly lowered the collective and increased the airspeed. The pilot regained control of the aircraft 30-50 feet above the trees after the aircraft had made three 360° turns.

After regaining control of the aircraft the pilot and crew elected to continue the mission. The crew decided to abort the mission 10 to 20 minutes later due to increasing wind and turbulence. [SAFECOM 11-348](#)

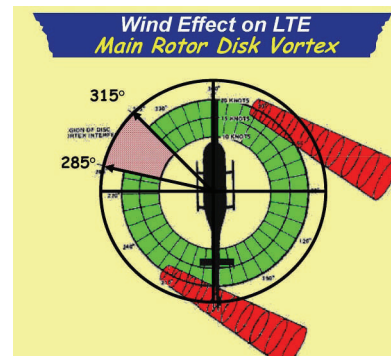
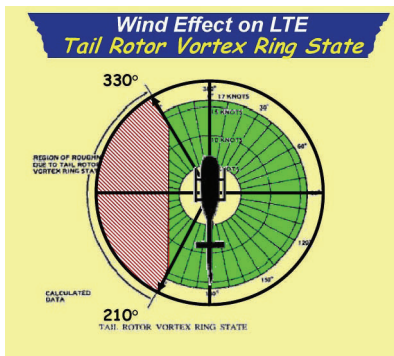
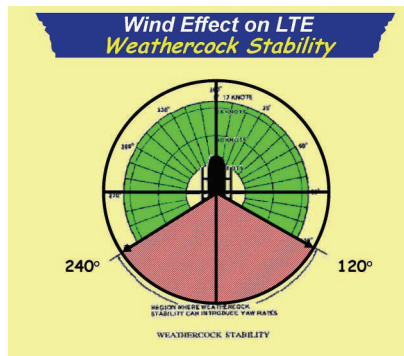
FAA Advisory Circular (AC) 90-95 identifies LTE as a critical, low-speed aerodynamic flight characteristic which can result in an un-commanded rapid yaw rate which does not subside of its own accord and, if not corrected, can result in the loss of aircraft control.

Factors that increase the likelihood of encountering LTE include:

- High Density Altitude
- Low Airspeed
- Poor Performance Planning
- High Gross Weight
- Low Rotor RPM
- Poor Pilot technique

While LTE is not a mechanical failure of the tail rotor system, the potential for encountering LTE is increased (and the ability to escape from LTE is reduced) if the tail rotor has not been rigged properly.

AC 90-95 also warns pilots to be alert to certain wind conditions when operating at low airspeeds (generally below effective translational lift):



Winds from each of these regions creates tail rotor thrust variations and increases the pilot’s workload.

While pilots must always comply with the procedures listed in their aircraft's operating manual AC 90-95 recommends the following techniques to recover from LTE :

- Apply full pedal opposite of the direction of the turn.
- Increase airspeed.
- Reduce power if altitude permits.

For a full discussion of LTE refer to [FAA Advisory Circular 90-95](#).

Summary

Thorough pre-flight planning is essential to preventing an LTE event. Avoiding LTE is best accomplished by flight crews being knowledgeable and avoiding conditions conducive to LTE. Flight crews can significantly reduce LTE exposure by using the proper performance charts, loading the aircraft appropriately, maintaining awareness of winds, and flying conservatively during hot, high or heavy conditions.

If an LTE event occurs the mission should be aborted and the aircraft returned to base. If unusual flight characteristics are experienced during an LTE event, land as soon as is practical and have the aircraft inspected in order to ensure no damage has occurred.

LTE events must be immediately reported to local and regional aviation managers. The event should also be documented in a SAFECOM for accident prevention purposes.

The images below are from a video of an LTE event in 2004. Click on the picture to view the video.



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