

# Altitude & Airspeed

## Both Play a Role in Downlink Safety

By Keith Johnson, ALEA Safety Program Manager

Microwave downlink provides enhanced capabilities to today's fixed and rotor-wing aircraft. However, there are also risk management issues that must be addressed. These issues include:

- Maintaining altitude and airspeed commensurate with good risk management practices.
- Proper division of workload between the pilot and tactical flight officer (i.e. crew resource management).
- Flying the aircraft in a manner that enables the crew to provide ground personnel with an acceptable video to accomplish the mission. (Note: Safety should not be compromised in favor of the mission.)

Early versions of downlink that supported older camera systems often found aircrews needing to operate at relatively low altitudes, often below 1,000 feet AGL. Most modern camera systems enable crews to operate at altitudes above 1,000 feet AGL, and doing so provides several safety benefits. Operating below 1,000 feet AGL can place the aircraft inside the knee of the height-velocity curve. In incidents of power unit failures, the pilot may not be able to successfully land the aircraft without damage to the aircraft and injury to the aircrew. Given the fact that 20 percent of all law enforcement accidents since 1999 were due to loss of power, this is a significant threat that must always be assessed when operating at lower altitudes. Greater altitude and/or airspeed are almost always a benefit.

Most video downlink operations can be conducted at 1,500 feet AGL and above. These include video of traffic, sporting events, community activities and concerts. These are generally law-abiding events where video assists personnel on the ground in managing the event. Still, altitude and airspeed should be taken into account as part of good risk management.

Operating in out-of-ground effect (OGE) hover at low altitudes may not allow the pilot to maintain control of the aircraft in the event of loss of power, hydraulic failure and/or tail rotor failure. This was evidenced in two ENG accidents in recent years. Most notably, in one accident, the pilot was operating at a low-level OGE when the hydraulics failed. The pilot failed to regain sufficient airspeed, lost control of the aircraft and collided with buildings, destroying the aircraft. This was a clear example of the pilot's failure to employ good risk management practices in an attempt to accomplish the mission.

When engaged in low-level OGE hover, the pilot must be vigilant in maintaining altitude so as not to enter vortex ring state (settling with power). The pilot can easily lose several hundred feet of altitude prior to recognizing this condition and recovering.

The most accepted flight profile that electronic newsgathering helicopters employ today is to place the aircraft in an OGE hover at altitudes of 1,500 feet and above. Some video equipment even allows crews to stand off at distances of several miles. The operating environment must be considered in order to transmit video that can be received in a quality that meets mission requirements.

The quality of downlink is generally enhanced by operating at 1,500 feet AGL and above. And, in the case of transmitting video when attempting not to be detected, altitude is better.

The majority of law enforcement accidents are the result of loss of control of the aircraft, and many of these accidents are precipitated by the pilot becoming distracted from flying the aircraft by what is occurring on the ground. This is easy to understand, as we want to maintain situational awareness with reference to the ground. But this should be avoided to the extent possible.

The pilot's workload should first include flying the aircraft safely, which requires maintaining altitude, communicating with ATC and other aircraft, scanning for obstacles, maintaining clearance from clouds and other obscuring phenomena, maintaining altitude and airspeed appropriate for the mission and environment and maintaining good crew resource management practices. Pilots have plenty to keep busy without becoming focused on what is the tactical flight officer's area of responsibility.

Lastly, public opinion polls conclude that people's perception of helicopters is that they are unsafe and make too much noise. We all need to be mindful of these perceptions and always operate in the safest manner possible and in a way that minimizes noise. We are doing important work to safeguard

the public and our colleagues on the ground. But if we want to improve the public's perception of helicopters, we need to eliminate accidents and minimize noise to the extent we reasonably can. It's also the safest way to operate.