



BEYOND WHAT WE CAN SEE:

Understanding Rotor Wash & Wake Turbulence

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Rotor wash is a significant aviation hazard. It may also be one of the least understood. Every helicopter pilot has seen what a rotor system can do. Dust can turn a routine landing into one with brownout conditions in seconds. Snow can erase the outside world. Loose equipment can become airborne, and people on the ground can quickly discover that standing near an operating helicopter is very different from watching one from a distance. Those are the effects we can see.

What receives less attention is what happens beyond the obvious rotor effects, particularly when another aircraft enters air that has been disturbed by a helicopter.

"Rotor wash and wake turbulence are not discussed in aviation training," said Ken Solosky, a safety and security consultant and former New York Police Department lieutenant and chief pilot. "That is across all types of aviation. Pilots can encounter rotor wash or wake in situations they may never have been taught to expect. It is a serious safety hazard that is too often overlooked."

Public safety aviation often puts multiple aircraft in the same operating environment. Helicopters and airplanes share airports and training areas, and multi-agency responses can bring together platforms that seldom operate around one another.

Chance Encounters

Rotor wash and wake can become a factor in places pilots may not expect. Sometimes, the helicopter doesn't even have to be on the runway.

In May 2024, a Piper PA-20 was landing in Georgetown, OH, while a military helicopter hovered on a ramp adjacent to the runway. According to the NTSB accident report, the airplane touched down normally. As it passed abeam the helicopter, it suddenly "levitated" nose-high, yawed right and departed the runway. The airplane sustained substantial damage. The airplane wasn't following the helicopter. The helicopter was hovering beside the runway.

Other accidents have occurred under other

unique circumstances. At Fort Carson, CO, in 2014, a Diamond DA20 departed after a UH-60 and encountered its wake at approximately 150 to 200 feet above the ground. The airplane rolled left and eventually came to rest inverted.

In 2017 in San Juan, PR, a Cessna 182 following two landing UH-60 Black Hawks encountered a heavy downdraft followed by another burst of disturbed air. The small fixed-wing rolled inverted and crashed between the runway and taxiway, killing one occupant and seriously injuring another.

In 2022 in Indiana, PA, an Arion Lightning was on short final when a helicopter crossed the runway several hundred feet ahead. The airplane rolled inverted and struck the runway. That same year in Upland, CA, a Cessna 120 encountered downwash from a helicopter hover-taxiing adjacent to the runway. The airplane entered a steep bank and crashed to the right of the runway.

All these circumstances are strikingly different. The helicopters were hovering, landing, departing or crossing an area another aircraft was about to use.



One Hazard, Two Ways of Learning

Helicopter and airplane pilots typically come to the subject of disturbed air from different directions. For helicopter pilots, the effect is immediate and practical. Training emphasizes what is underneath and around the aircraft: people, equipment, debris and surface conditions.

Airplane pilots generally address the subject as wake turbulence. The familiar situation occurs when a large airplane is ahead of another, and training is focused on flight path, wind and the movement of trailing vortices. Helicopter wake doesn't always fit neatly into either picture.

The FAA addressed the issue specifically in AC 90-23H, its updated wake-vortex guidance issued in January 2026. Small aircraft are advised to avoid operating within three rotor diameters of a helicopter in a stationary hover or slow hover taxi. The guidance also tells airplane pilots to consider a rotorcraft of comparable size as a larger aircraft for wake-avoidance purposes.

Three rotor diameters can encompass considerably more space than the helicopter itself occupies. Wind can carry the disturbed air somewhere else after the helicopter moves.

Recognizing the hazard, unfortunately, doesn't always mean understanding it. At Fort Collins-Loveland Municipal Airport in Colorado in 2014, a student pilot flying a Cirrus SR20 saw a UH-60 operating in the traffic pattern and was concerned about its wake. He delayed his turn to base and adjusted his approach to land beyond the helicopter's touchdown point. Then the Black Hawk departed. About 30 seconds later, the Cirrus encountered turbulent air approaching the runway and rolled sharply left. The student attempted to recover and go around, but the airplane struck the ground and cartwheeled. The pilot was seriously injured.

The student knew helicopter wake could be dangerous and tried to avoid it. What he didn't fully appreciate was where the disturbed air would be and how significant it could remain for an extended time.

A Place in Public Safety Training

Public safety crews have a long list of subjects competing for training time. Patrol, surveillance, tactical operations, search and rescue, firefighting, disaster response, NVGs, mission equipment, emergency procedures and recurrent aircraft proficiency all deservingly take priority.

Rotor wash and wake turbulence can easily become subjects assumed to have been covered earlier in a pilot's career. Solosky's point isn't that pilots need another lengthy aerodynamics class. The subject can become part of the training and conversations already taking place.

Repeated approaches and hover work can include consideration of nearby aircraft and where disturbed air may travel. Multi-agency briefings can address wake when different aircraft types will be operating together. Airplane crews working around helicopters can consider a wake picture that may be different from the one traditionally associated with following another airplane. Sometimes simply discussing the hazard is an effective way to bring awareness to it.

We routinely consider what we can't immediately see. Wires may be difficult to spot, so we look for poles and supporting structures. Weather beyond our present position influences decisions long before we reach it. Rotor wash and wake turbulence deserve that same awareness.

The helicopter may be gone. The runway may look clear. The air may tell a different story. ▀