DRONE INVESTIGATION EXERCISE

OBJECTIVE

Students will assess drone incidents using provided information to determine the probable cause(s) of each incident. Students' answers need not match in Session 1, as they will be refined for correctness later during Session 2.

SCENARIOS

1. Drone Incident 1: Multicopter crashes at a mill, and a skylight is damaged.
   a. Witness account: "I saw a drone flying around above the old mill. It was hovering in place, started wobbling around, and then began to fall quickly. Then I heard the sound of glass breaking."
   b. Weather conditions: Calm wind, OAT of 70°F, clear skies, 11:00 a.m.
   c. Flight log computer data: Nothing abnormal, indicates that the drone suffered no apparent technical faults. Control inputs show attempted recovery.

Probable cause(s):

Vortex ring state

Pilot error in VRS recovery technique

Pilot inattention

2. Drone Incident 2: Multicopter crash near Mt. Princeton, CO, damaging the sunroof of a jeep.
   a. Witness account: "As I was hiking, I saw a guy flying a drone; I assume he was filming, getting footage of Mt. Princeton. It's one of what we call the "fourteeners" here in Colorado, because it's over 14,000 ft high. The drone was above the treeline, approaching the peak. Then all of a sudden, I saw it fall, and it seemed to be spinning and tumbling down, and crashed through the sunroof of that car there."
   b. Weather conditions: Calm wind, OAT of 75°F, clear skies, 3:00 p.m.
   c. Flight log computer data: RPM of motors ramped up at a steady rate, topped out for a short while at 12,000 ft, and the gyroscope shows uncontrolled freefall shortly after. Propellers were not physically damaged before the incident as the motors do not show abnormal activity or extra load. No apparent technical faults. Control inputs show attempted recovery.

Probable cause(s):

Flying in high density altitude

Pilot error in flying too high