OAS-35A
(4/18)

Interagency Aviation
Lessons Learned

Subject: VFR Flight Operations / Decision Making / Risk Tolerance

Area of Focus: Flight Safety

Distribution: All Aviation Operations

Discussion: Recently, a contracted Cessna 207 sustained substantial damage when it impacted the ground just 1.85 miles from the destination airport. On board the aircraft were the pilot, two aircrew members, and one authorized passenger. Two of the occupants sustained serious injuries. Here's the story:

The flight was returning to the airport after completing a wild horse and burro survey mission in southwestern Wyoming. During the 60 nautical mile return flight, the pilot flew the aircraft at an altitude of approximately 700 feet above ground level (AGL). Due to light winds at the non-towered airport, the pilot decided to make a direct entry into a left base for runway 09. When turning to the base leg, the aircraft engine sputtered and quit. The aircraft had a pre-existing maintenance discrepancy involving a malfunctioning left fuel gauge that was known to both the pilot and aircrew. The Cessna 207 has two separate fuel tanks that require the pilot to switch from one side to the other in flight. The pilot "thought" he had more fuel in the left tank than he actually did based on the elapsed flight time. Due to the low altitude at which the engine quit, the pilot was unsuccessful at restarting the aircraft prior to impacting the asphalt road that led to the airport.

Based on aircrew statements, the time from when the engine sputtered to ground impact was approximately 15-20 seconds. That's not a lot of time. Certainly not enough time to try an airstart and set up for an engine out landing. So let's take a look at what could have mitigated some of the risks and potentially offered a better outcome.

1. Altitude. The engine out glide distance (in accordance with the pilot operating handbook) from 700 feet AGL was less than 1 mile. Had the pilot elected to fly at a higher Visual Flight Rules (VFR) cruising altitude, he would have had more time to complete an airstart or set up for an engine out landing. For example, increasing the aircraft altitude 4,700 feet (11,500 feet mean sea level) would have given an engine out glide distance of 6.5 miles!

2. Low altitude power loss preparation. Low altitude power loss in an aircraft requires immediate action to select an appropriate landing area and maintain aircraft control in order to effect a safe outcome. Had the pilot concentrated his efforts on an engine out landing, the aircraft could have possibly landed safely on the road. Instead, the pilot focused on restarting the engine at a very low altitude and failed to maintain adequate airspeed which then lead to a stall and subsequent hard landing.

3. Normalization of risk. The left fuel gauge was known to not indicate correctly by the pilot and aircrew due to a malfunctioning fuel quantity transmitter located in the left fuel cell. One aircrew member stated that the fuel gauge did not indicate correctly during a survey flown earlier in the year. A review of the mishap aircraft's maintenance records revealed that the discrepancy (erroneous fuel quantity indicator) was not documented. Maintenance log entries are required to correspond with the maintenance recording requirements of 14 CFR part 43, § 43.9(b). Additionally, each pilot in command (PIC) shall ensure that all mechanical irregularities occurring during flight are entered in the maintenance log at the end of that particular flight. [14 CFR §135.65(b)]. This risk was accepted not only by the contractor, but by the bureau aircrew and volunteer as well. Remember the saying: "If you see something, say something." Don't just accept that an aircraft is airworthy when systems or gauges are inoperative. Discuss the risk with the pilot-in-command and if you are still unsure, contact your local and national aviation management or the Office of Aviation Services.

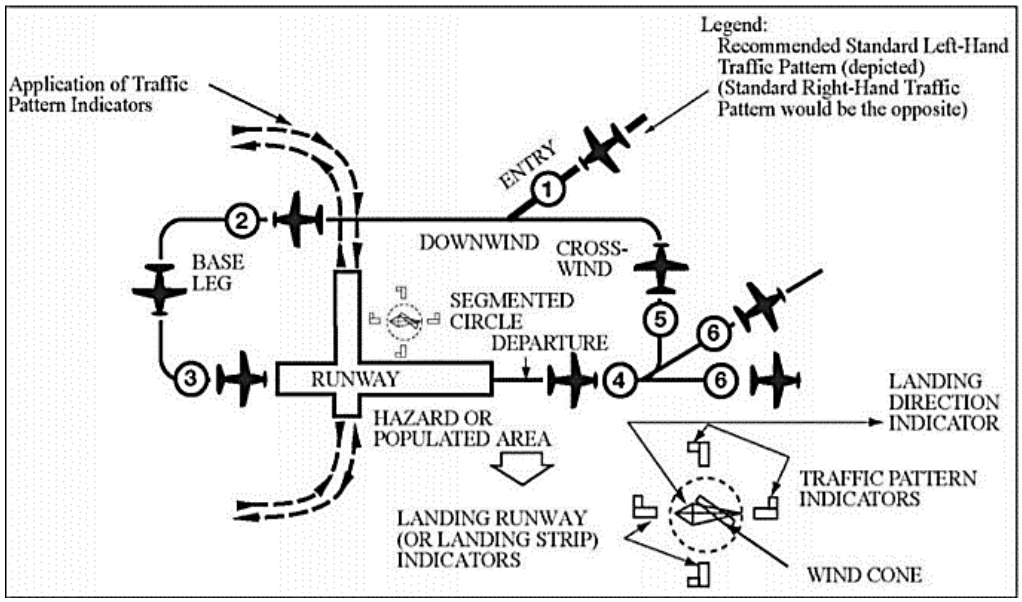
4. Aircraft airworthiness. The contractor's Director of Maintenance stated that there was no Minimum Equipment List (MEL) for the aircraft. The MEL is the specific inoperative equipment document for a particular make and model aircraft by serial and registration numbers. The Federal Aviation Administration (FAA) considers the MEL as a supplemental type certificate (STC). As such, the MEL permits operation of the aircraft under specified conditions with certain equipment inoperative. Without a MEL, the aircraft must meet the requirements of FAR §91.205 where a fuel gauge indicating the quantity of fuel in each tank was required for the flight. The aircraft did not comply with FAA regulations 91.205 and therefore was not airworthy.

Let's take a moment for a refresher on airport entry procedures. The FAA Aeronautical Information Manual (AIM, Oct. 12, 2017) and FAA AC-90-66B contains recommended procedures for entering a non-towered airport. Not surprising, none of the procedures include an entry at 700 feet AGL.

Recommended entry procedures from the AIM: (Note: the following numbers correspond with the airport entry diagram.)

1) Enter pattern in level flight, abeam the midpoint of the runway, at pattern altitude. (1,000' AGL is recommended pattern altitude unless established otherwise.)

2) Maintain pattern altitude until abeam



approach end of the landing runway on downwind leg.

3) Complete turn to final at least 1/4 mile from the runway.

4) Continue straight ahead until beyond departure end of runway.

5) If remaining in the traffic pattern, commence turn to crosswind leg beyond the departure end of the runway within 300 feet of pattern altitude.

6) If departing the traffic pattern, continue straight out, or exit with a 45 degree turn (to the left when in a left-hand traffic pattern; to the right when in a right-hand traffic pattern) beyond the departure end of the runway, after reaching pattern altitude.

Last, but certainly not least, single engine operations require contingency planning…all of the time. Always play the "What if?" game. "What if the engine quits?" or "What if I lose hydraulics?" This will better prepare you for managing in-flight emergencies that require immediate action. Refusing to accept a non-airworthy aircraft and flying at a higher altitude could have prevented this accident.

Don't set yourself up for failure. Question malfunctioning equipment and always be prepared for the unexpected!

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