The Short Course
Minimum Fuel Requirements

By Jim Sweeney

Pilots will often calculate the actual fuel consumption after filling the tanks. The top off and calculation could be while enroute or after the last flight of the day. Regardless, it is a good practice to calculate the actual burn rate and compare it with your expectation or the manufacturer's promises.

The topic of this month's Short Course is not what you burned, but rather - how much fuel was remaining. When was the last time you noted how empty the tanks were on landing?

In the early ultralight days, it was not unusual to hear pilots discussing how close to empty the tank was upon landing. In one case there was a contest to see who could drain the last little bit of fuel out of the lines, just as the ultralight touched down.

Although Part 103 has no minimum fuel requirements, the practice of landing on "empty" probably violates Part 103.9 (Hazardous Operations) and is surely an unsafe operating practice.

For sport pilots, the rules are more specific. Part 91.151 (Fuel requirements for flight in VFR conditions) requires that we have a reserve as we land at our destination. Specifically - "…there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, during the day, to fly after that for at least 30 minutes." The PIC should plan the flight so as to land with a minimum of thirty minutes of fuel on board. Landing on fumes is not a safe operating practice and probably also violates Part 91.13 (Careless or reckless operation).

Then there was the airplane that came charging through the traffic pattern, headed directly for the airport. His close proximity to me and cutting off other aircraft in the pattern got my attention. He landed, rolled to a stop off the runway and exited the aircraft. Interested in his piloting technique, I landed and taxied to a stop near him. As I approached I noticed he was leaning on the strut and puffing hard on a cigarette. He tried to explain the events. He was on fumes as he descended through the traffic pattern, had run out of fuel on final and rolled to a stop off the runway. We had words.

Looking back on the day there was both good and bad:
Good -

- Aircraft in distress have the right of way. Part 91.113 (Right-of-way rules)
- Aircraft in the traffic pattern were able to avoid him
- He made a successful emergency landing

Bad -
Poor flight planning
No communication on CTAF
He had run out of fuel
Ugly -
His wife and two children were on board

We had more words.

A cross country can only be enjoyed if fuel is available at the planned stops. If the fuel is not available, the reserve is what is use to fly to the alternate and refuel. If there is no reserve or the reserve is not a large enough, the only choice is to remain on the ground until fuel can be acquired.

In From Point A to Point B, I mentioned a one hour reserve rather than the thirty minute reserve required by Part 91.151. This recommendation comes from experience. The next airport with fuel available may very well be more than thirty minutes flying time away. Some of the reasons fuel may not available as anticipated include:

Fuel exhaustion - no fuel available
Fuel tank empty and the FBO did not reorder
FBO quit and the airport board did not know how to order fuel
Self Serve tank empty
Good flying weekend and the tank was pumped dry
Bad info in the Airport/Facility Directory

Fuel Starvation – fuel available but could not be pumped
Self Serve phone line out of order
Self Serve card reader out of order
Self Serve for club members only
Self Serve instructions more complicated than the GPS operations manual
Electric service out of order
Fuel pump not working
Fuel truck not working or will not start
Fuel truck driver not around or out of order
FBO closed early
FBO took the day off
The “after hours” number not working
The “after hours“ number not answering – call goes to voice mail
And the one that hurts the most – Credit Card Denied

Remember - In cold winter months and short days, FBOs have been known to close early. During long summer days and because it is still light outside, doesn’t mean that the FBO is still open. Hours of operation may vary form published times. If in doubt, call ahead. They may answer the phone.

Changes in the forecast weather can also play a factor. Fuel availability at your next fuel stop does no good if you can not get to it. Low visibility, high winds, pop up thunderstorms, rain showers and other weather conditions may cause you to deviate to your alternate airport. Good pre-flight planning and an early decision to go to the alternate should allow you to arrive with a reserve. Remember, the alternate airport may solve your weather problems, but it could have its own fuel problems.

In addition to fuel availability, you may also have to plan for fuel type availability. Auto fuel, commonly used in the Rotax 912ULS, may not be available at every stop. 100LL can be used as an alternative. However, if it is used extensively your mechanic may suggest a change in the type of oil and frequency of oil changes.

Leave yourself an out. Depart with full tanks (weight & balance allowing). If you make a stop, top off. Plan to land with a reserve. Experience has proven that an hour reserve is better than the thirty minutes required by the regulations.