



Interagency Aviation Accident Prevention Bulletin



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Subject: Aircraft Fueling

Area of Concern: Flight Safety

Distribution: All Aviation Activities

Discussion: The following is from a NTSB preliminary report ([CEN14FA462](#)).

A couple of years ago, a Cessna 421C was destroyed when it impacted the ground shortly after takeoff. The pilot, two medical crewmembers and one patient were fatally injured.

The airplane arrived to pick up a patient for transport to another city. The pilot, while seated in the cockpit, gave the line service technician a verbal order to fill the aircraft with forty gallons of fuel.

The line service technician drove a fuel truck to the front of the airplane and refueled the airplane with 20 gallons in each wing. The pilot then assisted the line service technician with replacing both fuel caps. They both walked into the office and the pilot signed the printed fuel ticket.



During climb out, a medical crewmember onboard the airplane called their dispatch on a satellite telephone to inform them that they were returning to the airport due to smoke coming from the right engine. A witness driving on the interstate highway reported that the airplane was westbound at about 200 feet when he saw smoke appear from the right engine. The airplane then began to descend and start a left turn. Another witness, driving on the interstate highway, reported that the airplane was trailing smoke when it passed over him at about 100 feet. He saw the descending airplane continue its left turn and then lost sight of it. Several witnesses reported seeing or hearing the impact followed by smoke and flames.

A post-accident review of refueling records and interviews with line service technicians revealed that the airplane had been fueled with 40 gallons of the wrong fuel (Jet A) instead of the appropriate 100LL aviation gasoline.

Misfueling prevention efforts begin and end with communication between the line technician and the pilot. The simplest and most effective way to prevent misfueling is for pilots to be present during fueling which enables them to **verbally and visually** confirm the required fuel grade and quantity with the line service technician **before** fueling the aircraft.

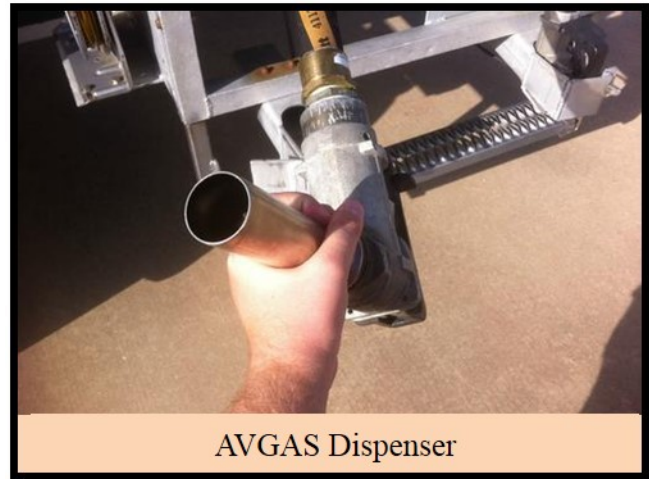
Mistakes can occur that make the cross contamination unidentifiable regardless of fuel grade markings and nozzle barrel type. Pilots operating in remote areas or use Fixed Base Operators using personnel with limited experience in fuel quality control, need to be especially vigilant when refueling.

Additional precautions are added to distinguish between avgas and jet fuel beyond markings on containers, vehicles, and piping, due to the catastrophic danger that can result from confusing the fuel types. These precautions include the aperture on aircraft fuel tanks requiring avgas are limited to 60 mm in diameter. Additionally, avgas is often dyed and is dispensed from nozzles with a diameter of 49 mm (40 mm outside the USA).

Jet fuel is clear to straw-colored, and is dispensed from a special nozzle called a J spout that contains a rectangular opening larger than 60 mm diagonally in order to prevent it from fitting into avgas tank ports. However, some turbine aircraft, including some Astar helicopter models, possess a fueling port too small for the J spout, thus requiring a smaller nozzle.



Jet Fuel J Spout



AVGAS Dispenser

For an excellent training video on misfueling prevention, go to: <http://nata.aero/Education-and-Training/Misfueling-Prevention-Program.aspx>

This accident serves as a reminder of the importance of ensuring the right fuel, in the right quantity, is loaded into the right aircraft, without contaminants, every time. Make no assumptions - especially if you operate in remote areas and rely on fuel caches. Ensuring that the fuel cap is properly secured is the final step in the process.

There are numerous reports in the SAFECOM system of aircraft receiving the wrong fuel grade, under and over fueling, missing or unsecured fuel caps and contaminated fuel. [Safecom 16-0455](#) is one example that fortunately had a good ending.

Unfortunately, simple things can often be overlooked by even the most experienced. Assume nothing and always verify.

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