THE GAMGRAM

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THE PIPE PLUG PHANTOM AND OTHER FRIGHTENING STORIES

One of the truths of quality control is that the better it is, the easier it is to take it for granted. When you have very few problems, it is hard to be as careful as you should, and the problems you do have are more difficult to anticipate. In any business, you do not announce your problems to the world, and unfortunately, this makes it difficult for others to learn from your mistakes. This GAMGRAM is a collection of stories about problems other people have experienced. You may learn from their mistakes. To avoid embarrassment, no names or locations are given. We have tried our best to tell these stories accurately, although some are based on second hand information. The problems are real and can happen anywhere

#1 BEWARE OF THE PIPE PLUG PHANTOM!

At nearly every airport fuel terminal there is a “phantom”. The “phantom” puts a pipe plug in every leaking air eliminator, pressure relief, manual drain and automatic water drain valve. Look around your facility, and you will likely find these “temporary” fixes. The danger can be greater than you think. A plug in a pressure relief valve can cause more leaks or a rupture. A plug in an air eliminator can keep a filter vessel full of air causing an internal fire (see GamGram 15). A great danger is a plug in the float control vent or automatic water drain valve (often the vent is piped into the outlet side of this valve; see GamGram 10, GamGram 11, & GamGram 12). This can prevent operation of an otherwise functional water control and slug valve. Be sure leaks are fixed, not plugged REMEMBER ALL FLOAT CONTROLS HAVE TO HAVE A VENT!.

#2 FLAMEOUT

At a major US airport, a refueler truck was parked unused for several rainy days. The manway gasket had deteriorated, and a mechanic had to replace it. He was not able to entirely remove the old gasket and glued the new one over this uneven surface. The result was an imperfect seal. The trough hoses that were supposed to allow rain water to drain from the tank roof had been plugged with leaves and other debris. In addition, the float operated water control on the filter separator had not been tested in a long time and the mechanism was not able to move smoothly.

The driver went to the truck, took a sump sample from the filter separator and got good, clear jet fuel. He could not or did not take a cargo tank sample. Since the internal valve was not open (it opens when the PTO [power take off pump drive] is engaged), the water in the cargo tank went undetected. Two aircraft were refueled. The first one took off without a problem. The second flamed out on the taxiway ramp. Some very smart individual immediately radioed the first aircraft which made a precautionary landing. Over 100 gallons of water was drained from each of these aircraft. It was a very close call indeed.

We know of at least seven similar stories. In one, a sample was taken from the wing tank and since the jar still smelled of fuel from past use, the operator thought it as “water white” jet fuel! In another case, the cargo tank drain was operated, but because the refueler was parked on a slope, the water had run to one end. In still another case, snow and ice plugged the drain hoses from the tank roof.

The morals are: These water controls, get tank and filter sump samples, keep drain hoses and manway gaskets well maintained and use food coloring dye or spill coffee into a sample to be sure it is not 100% water.

#3 CONCRETE

At a mid-sized airport, a transport truck made a normal delivery. The terminal, driver and truck were all from a major oil company. The FBO had been in business for 20 years without a single fuel problem. Somehow, the paperwork on the trailer was mixed up with another. Because of complacency caused by their perfect safety record, white bucket samples of each receipt load were not taken. The pump ran for a few seconds and stopped. It seems that one particular grade of liquid fertilizer turns into a solid similar to concrete when mixed with jet fuel.

Moral: Obvious. But what if it had been a product that could go through the system, like acetone or varnish?

GAMMON

GAMMON TECHNICAL PRODUCTS, INC.
P.O.BOX 400 - 2300 HWY 34
MANASQUAN, N.J. 08736

PHONE 732-223-4600
FAX 732-223-5778
WEBSITE www.gammontech.com
STORE www.gammontechstore.com

#4 BOOM!

At a large airport fuel farm, every filter vessel and tank had a sump sample taken at the beginning of each shift. When a particular system was temporarily shut down, the filter separator was still sampled three times a day. By the time that system was needed again, the vessel was empty. When the pump was started, 600 gpm of fuel at high pressure sprayed out of the coalescers into an empty vessel full of air. Fuel, oxygen and electrostatic charges caused by the elements were present and BOOM!! It took some time to find the vessel cover, it was in a field across the road.

Similar explosions and fires have occurred numerous times, because the operator did not fill the vessel slowly after an element change or because a positive displacement pump was allowed to run after a transport truck was emptied, thus pumping air instead of fuel. Vertical vessels are more susceptible to this type of problem than horizontal vessels.

Moral: Several and obvious!

#5 8,000 gallons in a 5,000 gallon truck

A refueler truck driver was tired. He was reportedly working the end of a double shift. He pulled his truck into the fuel farm, hooked up the loading hose and jammed the deadman handle. He went back to sit in the cab for a minute and fell asleep. The overfill control on the truck failed and he awoke to one heck of a mess!

Mortal: Obvious!

#6 MISPLACED TRUST

A major oil company inspector was on a routine inspection of his best FBO. The manager took great pride in exceeding all Q.C. requirements with his own system, including a hand-picked and trained field man. The inspector knew he had to actually inspect anyhow, and it's a good thing. He noticed that the handle of the thief pump on an underground tank would not move. The manager was very embarrassed when a change of pumps yielded 20 gallons of dirty water. The check sheet showed no water from that thief pump which supposedly had been tested four hours earlier.

Moral: Obvious!

#7 NO PRESSURE DROP (?!)

A lineman complained to the mechanic that the avgas truck flow rate was too low. The mechanic checked out the problem and found a flow rate of less than 5 gpm. On further inspection, he found that the actual filter pressure drop was over 90 psi (no error). Because flow rate had slowed due to high pressure drop, a driver had adjusted the pump bypass pressure control to get more flow, and the mechanic did not notice, because the pump was so worn that it only delivered 25 psi at engine idle speed (the mechanic checked the truck at idle). When the operator pulled the PTO (power take off) throttle lever out, trying to get more flow, pressure went over 90 psi. A 90 degree selector valve and gauge were used to determine pressure drop. Because the valve positions were not marked, no one got good readings. (see GamGram 1). All readings had been taken at engine idle.

A study of the pressure drop records showed 1 psid for each reading for the 2 years (all inaccurate).

Moral: Check your equipment and personnel. Do not trust consistent records.

It is not possible to find humor in these stories. The chance of disaster is remote. Usually several errors, failure or mistakes have to occur simultaneously for a disaster. The question is, could you live with yourself if you were responsible for death or suffering? Intentions are not important, performance is. One accident a year worldwide is one too many. We have come too close to major disasters in the past -- it can happen.

BALANCED POLICY - In ancient times, it was policy to kill the messenger that brought bad news. We assume that not all bad news got through! CAN'T DO THIS! Review your methods, and don't make the punishment for a mistake equal to the punishment for covering up a mistake. This especially applies to fuel spills and other legal and safety related situations. Don't laugh, we've heard of people who tried to hide fuel spills to protect their jobs! In one example, an employee washed the fuel into a stream -- resulting in a much larger mess to clean up. The government sees this as your fault and may levy larger fines!!