

Brain Work

...and how to know what we don't know

Safety Topics I Thought About

- **Hypoxia**
 - My personal limit is 10,500 if over one hour
- **Keep emergency items within reach**
 - When you need that fire extinguisher, can you reach it
 - How about the oxygen tank and breathing tubes?
- But you already know all about these things

I Just Don't Know Enough!

Then it struck me that I really don't know enough to know what to talk about, and so I said out loud to Melinda:

“I don't really have anything to say about safety, because I don't know how to be a safe pilot, how to be safe while flying. I'm a low time pilot, what do I know?”

Let me 'splain

At which point she really wanted to know what the heck I meant by:

“I don't know how to be a safe pilot.”



Let me 'splain

- I told her that I know how to prepare for a flight,
 - oil at proper level;
 - no water in fuel, correct fuel color, enough fuel for planned flight;
 - hinges hinging, lights lighting, screws tight;
 - prop not cracked or chipped or otherwise, compromised;
 - belt tight, tires inflated, brake fluid not leaking,
 - controls coordinated, and so on.

Let me 'splain

- I know how to check other things, too:
 - the various weather sources, and if not a fair weather flight, I might even consult flight services;
 - I know to check what's up at an unfamiliar airport and what my options are in case I cannot land at the targeted destination;
 - I've got my radio frequencies listed;
 - My winds; best altitudes;
 - I've got maps, GPS, iPad, iPhone;
 - Got my flight plan planned
- the list goes on and on.

Let me 'splain

At which point she was really, really happy. I thought I was her hero!

Dinner that night was gonna be great.



Let me 'splain

But then she started thinking about all those things I mentioned, and she got oh so worried.

Dinner that night was not gonna be all that great, if I got any at all.



Let me 'splain

- I tried a different tack. I said to her that there were times when, **as I am hurtling down the runway for takeoff**, that I would get this sense of unease; that I know a lot, but not enough; that **I should know more**.
- In short, sometimes I feel that I need to know more to be really safe; that **I don't even know what it is that I don't know!**

Let me 'splain

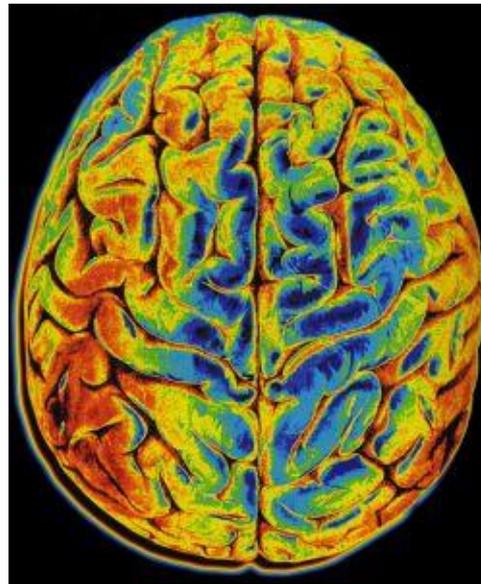
I've never been all that smart or tactful.

Definitely no dinner.



Brain Research

- And this led me back to what I've been reading lately about brain research



Who da Boss, really

- Information Intake
 - Apparently, the unconscious part of the mind takes in millions of pieces of information per unit of time, then organized and acted upon emotively
 - Whereas, the conscious part of the brain can handle, on average, 40 pieces of information per unit of time
- Most complex decisions are made unconsciously
- The simple stuff (such as a green light means go) consciously

Multitasking Analytical Giants?

- Flying planes means we are great at Multi-tasking!
 - Nope. At a conscious level we are not good at it.
 - Gets worse with age.
 - Why do you think we use check lists
 - Lists are linear, easy to use;
 - Helps us to remember all the complexities of the plane and flying it;
 - Help us get through stressful times, like emergencies;
 - Help to increase our rationale decision making.
- We need to use our unconscious to stay safe

Listen to What the Plane is Telling You

- John Nutt, out of KBED, was my CFI, and a good one. He would say to me, especially when I didn't catch what he was throwing at me:

“Listen to what the airplane is telling you; feel what the airplane is telling you; don't simply rely on what you think it should be doing. If it is doing something that doesn't feel right or sound right, you should be able to sense that and start to process.”
- This speaks to how we all probably fly, but are often unaware of it; it speaks to how we process and sort things out. It speaks to the unconscious.
- Going over check lists is very rational. It is very much something we should do religiously, especially as our machines become more complex, and our age becomes, well, greater.

Checklists have Limits

- BUT! No checklist can be detailed and quick enough to tell us what to do for each unknown, unrehearsed circumstance.

Often we don't have time to do a checklist.

We must understand that there is a problem, bring that problem into focus, and react.

Example – Smiley Creek Incident



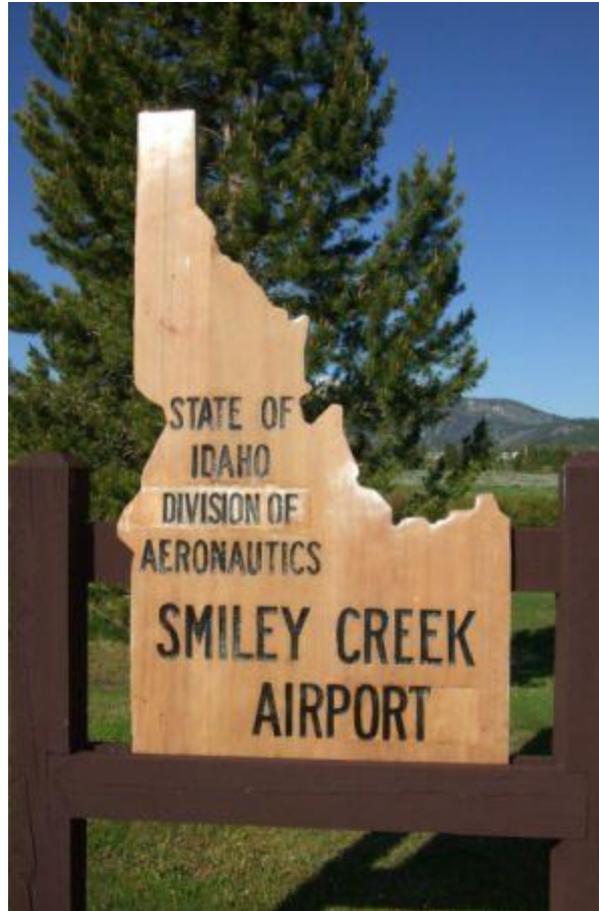
Example – Smiley Creek Incident



Example – Smiley Creek Incident



Example – Smiley Creek Incident



Example

- Pattern Altitude at Smiley Creek = 8,000 ft.
- Took off for a scenic flight to Challis, ID.
- Over Challis, **FELT** something wrong
- Quick look found all gauges good
- Decided to gained altitude, to verify wind direction and landing location (airport within reach)
- Began to troubleshoot

Example

- Checked mags, for that was the first thought, but they each checked the same;
- Was at almost full throttle, so throttled back to check different RPM, and that had an effect! I needed to keep the RPM's up or it would want to run very rough;
- Thought it might be flooding, so tried to lean. Nothing good or bad at the bad RPM.
- Determined okay to fly if RPM kept up, so went back to Smiley Creek.

Example

- Turned out to be 3 unconnected problems:
 1. Loose left mag (which is what we focused on and fixed, but did not know of the other two at that point, no plugs were fouling)
 2. Fuel leak in carburetor
 3. Bad gasket in #4 intake tube
- I had never had any of these problems singly or together prior to this incident, so nothing to point me in the right direction while in the air. The only thing was **I had a sensation that something was wrong**. No clear evidence at first; it just felt wrong.

So what's the conclusion?

- **Emergency Checklists**
 - Practice (on the ground and in the air) the typical emergency checklists until you can prove that they are truly automatic. Don't think that you can grab a checklist and start reading while you are flying the plane in an emergency.
- **Gain Knowledge and Perspective at Every Opportunity**
 - Expand the biennial beyond the typical air work. Come up with non-standard "what would you do if..."
 - Ask questions of fellow pilots like, "What have you experienced that was unusual, out of the norm, and how did you solve it?" Lessen the prospect that you don't know what questions to ask because you don't know what you don't know.
- Most importantly, **listen to what the plane is trying to tell you**
 - Let go of your analytical pride.
 - Let go that everything about flying is a series of checklists.
 - Let the unconscious do its magic (gather those millions of bits of information, come to some emotional conclusion, then pass that over to your rational conscious mind to analyze).

How'd dinner turn out?

Well... Let's just say that she's a fine, fine cook!

And, still flies with me...

