



**Tribal Knowledge Part 2** If you missed the last issue with Part 1 I suggest you go back and check it over as Tribal Knowledge (TK) is usually restricted to one organization or tribe and the goal is to enlarge the tribe and thus improve aviation Safety. So welcome to the tribe.

### **7. Any distraction – go back 3 steps**

Going back 3 steps is a personal Safety net that I've always used with any distraction. Article 17, August 2016 list other Safety nets as well. One near accident I recall was due to a distraction at a critical point in a pre-takeoff checklist for a heli-logging S-61. It had just lifted off from a barge located in a remote inlet when it starting rotating. The anti-torque pedals had no effect. They couldn't re-land in this condition and as they were heli-logging in a remote area, there were no airports within fuel range to perform a run-on landing.

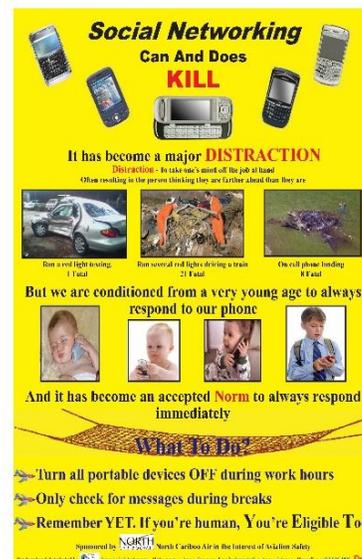
They picked up forward speed until they reached a speed that caused the rotation to stop, but they were in serious trouble with no suitable location to attempt an autorotation at.

They contacted maintenance who had worked on the aircraft through the night and learned they had been replacing rod ends and bolts in the anti-torque system and that called for "rigging pins" being installed to keep the system in rig. On checking they discovered that one pin was missing and had an ugly suspicion that it was still somewhere in the system.

With fuel and time running out. the copilot checked the system back from the pedals and fortunately found the missing pin locking the system behind the copilot's seat in what they called "the broom closet." All flight controls call for a dual inspection and a function check prior to final sign out. Somehow it got missed. None of the rigging pins had any flagging on them that would have made them easier to see. No missing tool check was done and you can guess when this

check was carried out. Yep the witching - I don't care hour of between 5 and 6 am after working all night. Maintenance had stopped for coffee just prior to pulling that last pin out and were sure that they had done it prior to sign out. The pilot's preflight checklist calls for a control movement check prior to take off but the checklist was stopped just prior to that call out due to an electrical problem and they restarted the checklist beyond the control check callout. "3 steps back" by either or both would have prevented what was shaping up to be a catastrophe that likely would have been fatal.

**8. No cell phones allowed on the hangar floor or at work.** I swear that man's greatest distraction invention has to be the cell phone. Now I believe that it was Harry Truman who said; "There are lies, dam lies and then statistics." Some statistics point to 1 in 4 fatal car accidents having a phone distraction involved while texting with that phone and driving more than doubles the chances of an accident. A company almost experienced an incident with one of their Dash 8s when an AME while checking the oil in an engine received a phone call. He climbed down the ladder to answer it and as a result he forgot to secure the dipstick back in place. If you recall article # 17, DOM August 2016, you may remember that a distraction takes your mind away from the task at hand and unless there is visual evidence otherwise, you'll think you are further ahead than you actually are. This is because "the mind works faster than the hands". Fortunately, a final "Safety net" in the form of a conscious copilot on final walk-around actually got a ladder and on checking the oil level discovered that the oil dipstick had not been secured. An engine failure on takeoff with a full load of passengers could have had very serious consequences. They contacted System Safety Services and asked if we had a Safety poster to remind their personnel of the dangers associated with man's #1 distractor. We didn't, so we developed one. I suspect that their TK now includes the non-use of cell phones when working. Does yours?



**9, Count your tools before and account for them after work done** I certainly wish we had practiced that one when, many years ago, I left a new flashlight in a wheel well. Of course it was not done on purpose and I didn't realize that it was missing until the aircraft had departed to haul fuel to a remote location for two weeks. I dared not report it as the company at that time had a policy that if you made an error you were fired to serve as an example for the others to "be more careful". I "sweat bricks" for two weeks praying that that flashlight did not come loose and jam the gear. As soon as it returned to base I was out there, retrieved a muddy flashlight with leaking carbon batteries and dropped it in the rubbish bin. I felt like I had "dodged a bullet", but no one could understand why all my future flashlights had a red streamer hanging off of them and I talked to others to do likewise.



The strangest left behind tool that I found was a small bucking bar inside a Cessna wing flap. I noticed small dents projecting outward when inspecting a flap and when I bumped the lower skin something inside bounced back. We had to de-skin the flap to find a bucking bar that had to have been there for years. We had to replace that lower corrugated skin, making for a very expensive bucking bar.

**10. Nuts, bolts, clamps, left over? Find out why before it flies.** Go back to Article #56, Nov. 2019 re sweat the small stuff, a small clamp, and you avoid the big stuff; fatal crash leaving 4 dead and the end of the small airline. There you can see the wisdom of the above TK. 14 people died when a bag of 47 screws was found on a stand and ignored. Those screws held the top of a horizontal stabilizer leading edge that came off in flight at altitude, causing the aircraft to break up and scatter wreckage over a three-quarter mile radius.

**11 Always find anything that drops in an aircraft.** Go back to #43 June 2019 and discover how one small coin destroyed two lives when an AME dropped it and couldn't find it. No matter how small, given the wrong circumstances, it could jam a pulley at the wrong time with serious consequences.

**12. ALWAYS check oil before start. No oil pressure after 3 seconds: shut down.** A friend of mine told the following story of a TK beginning.

Over 40 years ago we had just completed an inspection on a single engine Cessna. I had watched earlier as my apprentice had put six quarts of new oil in the engine.

Outside the hangar I started the aircraft to complete the post inspection run up. After yelling "CLEAR", I started the engine at idle and I watch the oil pressure gauge, but it didn't move after a count of 1 - 2 – 3, so I pulled the Mixture and shut down the engine. First place to go was the oil dipstick, which when I checked, had no oil showing. That was strange because I saw the oil go in the engine!

As it turned out, the oil was added when the oil quick drain valve was still in the open position, so all the clean oil went straight into the oil bucket un-noticed. Someone else had closed the quick-drain valve and moved the bucket at the end of the inspection. That afternoon our Tribal Knowledge became, "No one shall start an engine without checking the oil level dipstick first, no matter what". Common sense, right? It's been 30 years since I have worked at that company. I wonder if they still have that Tribal Knowledge to check oil levels before starting an engine?

As you look back at these 12 examples of Tribal Knowledge you will notice that most are the result of an incident or accident with some even written in blood. Therefore remember that old adage to learn from the mistakes of others as you'll never live long enough to make them all yourself. Also keep in mind that Murphy's Law dictates that if there is a wrong way to do something, that's the way it will be done. You want these TKs to become norms (article #8 - July 2015) so everyone does them even if they no longer know the reason why they became TK in the first place.