Seven Years in the Life of a TSB Investigator - Part 5

A question that was often asked was*: "What do I have to do to get a job like yours?"* In simple terms, someone will likely have to retire or "jump ship" to create a vacancy. That doesn't happen often.

The ideal applicant will have high flight time experience on fixed wing, large and small as well as helicopter time. Throw in a degree in some aeronautical subject and you have a chance. Time in the military helps, especially if you had experience in the Safety dept. The technical investigator, which I was, needs an AME (AMT) license with experience working on aircraft from Piper Cubs to 747s. Having flying experience also increases your odds of getting the job. They also occasionally have a need for an air traffic controller and mechanical engineers in the lab. One more thing you might consider is attending an autopsy to see if you can deal with what you may be working with at an accident site.

#11 Even Safety Nets Can Kill

Drip torching is a method of setting fire to piles of logs so that in the event of a forest fire, this wood would not be there to add to the fire. It is a fast method of slash burning and involves hanging a 45 gallon drum of highly flammable fluid on a 50 ft line to a helicopter that can release the fluid on the material to be ignited and burned. The accident aircraft was a Bell 206 being flown by an experienced pilot with the door off for better vision of the drum on the line. He was leaning out and had just ignited a fire when the low rotor horn sounded and as he reiterated to me on his death bed, *"I had the collective in my armpit."* The helicopter came straight down on the now "pickled" (released) drum and into the fire. The crash punctured a hole in the aircraft fuel tank releasing more fuel to the now raging fire. He released his seat belt and jumped into the fire and managed to crawl over the burning logs and out of the fire. Another helicopter drip torching nearby saw the burning helicopter and flew over. He said that the pilot had all his clothes burnt off of him except a bit at the top of one leg. His skin looked like bacon crust and every joint that he moved, caused the skin to crack open and clear fluid came out. He flew him to the nearest

hospital where they could only relieve his pain but he would die within 24 hours. By the time I arrived there he was near coma stage and could only whisper. His wife and about 7 year old boy were there so I asked only a few questions. He appeared eager to tell me what happened. The engine had failed but he didn't realize it until it was too late. He died later that night. The 206 comes equipped with an engine-out horn that would have provided him with enough blade inertia and time to get away from the fire. That Safety feature would have saved his life and likely the helicopter.

However, Bell had issued a Technical Bulletin (#206-82-71) which stated that "*failure of the engine N1 tachometer generator causes the engine out audio warning horn to signal an erroneous engine failure, which has occasionally confused the pilot, causing an improper control response. In several recent cases, the N1 tach generator failed and the engine-out warning horn activated. The pilot hearing the horn surmised he had an engine failure and elected to go with emergency landing procedures. The aircraft auto-rotated into undesirable terrain."* The Technical Bulletin goes on to suggest that the fix (Safety net) for the problem is to deactivate the warning horn and placard the instrument panel, with a decal they will provide, that informs the pilot that the engine-out warning horn is deactivated. This Technical Bulletin had been carried out a week earlier and with it a new deadly hazard was created. A flame-proof Nomex suit and helmet also likely would have enabled him to at least survive.

The **moral** is to take that minute for Safety and weigh the risk for either option. Technical bulletins are not mandatory and training to look at other instruments beside the N1 should the horn sound would prevent the "*auto-rotating into undesirable terrain."*

#12 The Heli-Skiing Accident

A Bell 212 was being used to fly skiers into the mountains to find virgin snow to ski in. The privilege is expensive but they were guaranteed a minimum number of vertical feet, great food, free beverages and virgin snow untouched by man or beast. The pilot flying the aircraft had 20,760 flight hours of helicopter time and 5,330 on type. The 59 year old pilot was well liked by the skiers as he joined them in the partying. The skiers were given a short video Safety briefing in the bar prior to the flight. Most could not even recall the briefing later.

The pilot flew two groups to a 7,000 ft saddle and from there flew each group up to the 8,300 ft summit.

At lunch time he flew back for the lunches and to refuel. The fueling was from a gravity fed tank with no fuel quantity indicator for the amount of fuel being added. The pilot indicated that he had about 1/2 tanks when he left to

return to the mountain. At the 7,000 ft altitude the company SOP called for 10 skiers, plus the pilot and guide to be the maximum load. The owner's wife was cold and had climbed into the helicopter to get out of the wind. With 14 on board, she offered to get out when she heard them discussing having some skiers ski down to a lower altitude to be picked up. The pilot indicated the 14 would not be a problem. The pilot pulled the helicopter into a hover and noted he had about 10% torque remaining. He began the run into wind which was coming down the mountainside. This was into raising terrain and he began a slow low level downwind turn to the right away from the high terrain immediately ahead. The main rotor rpm was decaying so he attempted to land back on the glacier. On touchdown the skids dug into the snow and the helicopter rolled over 120 degrees onto its left side.

No one was hurt in the crash but on releasing their seatbelts they dropped into a pile with the 5 snowboards that were on board. A fierce fire erupted in the engine compartment and suddenly survival called for getting out as soon as possible.

The pilot was the first out his door while the guide ran out through the broken windshield. Five skiers squeezed through the 9" gap between the seat headrests and the ceiling while another 3 squeezed though a 12" window, broken from the outside by the owner of the lodge to rescue his wife.

The two large emergency exits in the sliding door were never opened. Three people did not exit and were burned to death.

So what went wrong and what was the maintenance contribution?

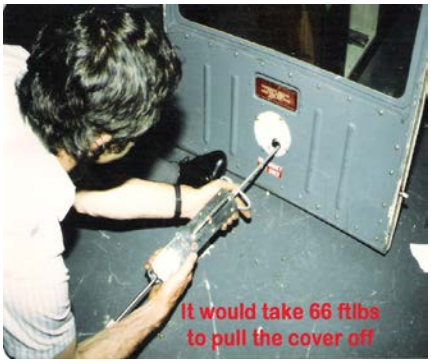
The pilot with 40 years of experience had become very complacent. It was said that he could get into places that other pilots couldn't or wouldn't. He was a favourite pilot because of this. It is suspected that he had put on more fuel then he intended and told us that he had. By accepting the extra two passengers he added to the take-off weight. Taking off into wind is not a good idea if it is over raising terrain. Lacking the power to overcome the weight and waiting too long to turn back resulted in a crash that did not incur any injuries.

However, a fire immediately started that resulted in 3 fatalities. The fire was due to a 90 degree aluminum fuel fitting breaking and releasing fuel under pressure that immediately ignited. It was attached to a steel fitting at the firewall and had it been made of stainless steel it would have been 8 times

stronger and much less likely to fail. Remember the DC3 (story #4) that failed due to an aluminum fitting that if it had been made of steel like the rest, the old girl might still be flying.

The pilot in turn made an error much like our Mooney pilot in story #2. He failed to turn off the fuel switches or master switch or pull the fire extinguisher handles. His only thought was to get out. He is dead now but never flew again and likely heard those dying screams for a long time.

You be the judge regarding maintenance whose error may not have contributed but very well could have. The cover over the emergency exit handles are made of plastic that, as they vibrate, wear and begin to fall off. It seems that on other aircraft as well as the accident one, a keen AME put washers under the holding screws so the covers would not fall off. Tests carried out on the modified cover revealed that it now took 66 ft lbs to remove the cover.



Imagine having one finger in the one inch hole and having to pull 66 lbs to remove it. One person did put his finger in one but he tried to turn it without success. The other maintenance error that could have contributed to fatalities was the headrests were all fitted with pippins (quick release pin) that allowed the headrests to be adjusted for height and to go down and turn sideways in an emergency. One was fitted with a bolt and self-locking nut. No one knew how to lower the headrests because they had not paid attention to the Safety video.

The moral. All accidents are never just one cause, but a series of links in a chain of events that lead to, and end in, the accident. We must take just a minute for Safety to ensure that what we are doing is Safe so we never become a link in that chain.

#30 which should keep me ahead for a bit.
1688 words, 1 cartoon and 3 pictures. This is the last of the war stories
There is an optional picture I took in my office here of an aluminum fitting broken (in the lab) and a stainless steel one. It illustrates why the stainless steel should be a must on the engine firewall side.
There is also an optional drip torch2 picture that you can swap if it shows the wreckage better than 1
If you can fit it in; great. As these are both helicopter accidents they could fit in with the helicopter edition.
Cheers

Gordon