

OBSERVATIONS FROM THE FLIGHTDECK

- LIFE LESSONS LEARNED THROUGH AVIATION -

by Jerry Tobias

"I applied my heart to what I observed and learned a lesson from what I saw."

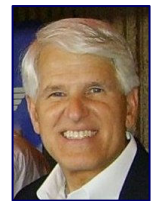
Proverbs 24:32



Airbus A330 flightdeck

FOREIGN OBJECT DAMAGE

...THE DESTRUCTIVE POWER OF LITTLE THINGS



FOD is an aviation acronym for *Foreign Object Damage*, and refers to "any substance, debris or article foreign to a vehicle or system that damages or could potentially damage that vehicle or system." FOD is often small, though its consequences are usually not. The hats, pens, small tools, parts, rocks and other debris frequently ingested by jet engines are good examples.

I have had numerous encounters - or close encounters - with FOD. One occurred somewhere over South Vietnam. During an otherwise normal flight, I looked back at the left engine, one of two Pratt & Whitney R2800 radials on our U. S. Air Force C-123K, and noticed "something" unusual between the 12 foot propeller and the front of the engine. I couldn't tell what it was, but knew it wasn't normal. Our flight mechanic went back to get a better look through one of the fuselage windows, and determined that a spool of maintenance wire was sitting on the shaft fairing just behind the propeller.

Long story short, after discussing and taking several precautionary measures that we hoped would keep the object from falling, we landed the airplane safely. That spool of wire could have toppled at any time, seriously damaging the propeller and/or the fuselage in the process. Instead, it sat throughout the initial taxi, takeoff, cruise, descent and landing without moving. How? None of us knew.

Another FOD encounter happened one day when I was conducting an after-landing inspection of our aircraft. As I examined the nose gear assembly, something shiny that was just barely visible near the bottom of one of the tires "just happened" to catch my attention. It was the head of a bolt that was imbedded in the right nose gear tire. We had run over it, obviously, while taxiing to the ramp after our last landing. If the airplane had been parked just two inches further back than it was, the bolt would have been on the bottom side of the tire, and would not have been visible. The high rotation speed of the tire during our next takeoff would have almost certainly thrown the bolt outward. The damage and/or incident that might have resulted could have been significant.

Serious FOD damage, fortunately, was avoided in these two scenarios. That, however, is often not the case. It is estimated that FOD costs the aerospace industry \$1-2 billion a year in direct costs, and as much as ten times that amount in indirect costs. Tragically, FOD also causes injuries and loss of life.

The Air France Concorde accident near Paris in 2000 is one example. It is now suspected (although alternative theories exist) that the Concorde hit a small piece of metal on the runway that had fallen off of an aircraft that had departed five minutes earlier, causing the chain reaction (shredded tire, ruptured fuel tank, fire, loss of power and, ultimately, loss of control) that led to the accident. Presumably, a *1" X 17" piece of metal* brought down the 410,000 lb. Concorde...and took 113 lives.

The Space Shuttle Columbia disaster in 2003 is another example. The loss of Columbia was a result of damage sustained during launch when a piece of foam insulation *no larger than a small briefcase* broke off the external tank. This debris struck the leading edge of the left wing, damaging the Shuttle's thermal protection system. During Columbia's re-entry, the damaged area allowed the hot gases to penetrate and destroy the internal wing structure, rapidly causing the in-flight breakup of the vehicle and the loss of seven brave astronauts.

In these instances, small, foreign objects led to tragedies. Other small things can also lead to disaster. The 1972 Eastern Airlines L-1011 accident certainly comes to mind. In this scenario, the crew was distracted by a burned-out light bulb on the landing gear position indicating panel, and failed to observe that the airplane had entered a shallow descent from their assigned altitude. Four minutes later, the airplane plowed into the Florida Everglades. Although 75 people survived, 101 lives were lost. And, it all started with one tiny, burned-out light bulb.

Little things can be incredibly destructive. A small nail in a car's tire can lead to a serious

accident. A carelessly tossed cigarette can burn thousands of acres. Tiny termites can destroy a structure's foundation.

The same principle, of course, applies to life, to you and to me. Tiny paper cuts or a bad tooth can produce disproportional amounts of pain. Pin head-sized ticks or other small insects can cause major health issues. Very small moles or other skin anomalies can become cancerous. Microscopic germs can, eventually, end a life.

Likewise, initially small, insignificant issues can separate family members and friends. One unkind word can have a serious and long-lasting impact. One wrong choice or bad decision can have major ramifications. One lie can ruin a relationship. And, one "small" sin can separate us from God.

What can be done about this? Thorough inspections are one part of the solution. If airport FOD is suspected, for example, teams are sent out with FOD sweepers or on foot to search for and remove the debris. If we've taken a summertime walk through the woods, it is wise to inspect ourselves and our pets for ticks. And, routine, pre-emptive physical examinations are always important for catching medical problems while they are still minimal and manageable.

A frequent self-inspection of the condition of our hearts is also important to identify and eliminate wrong thoughts, bad attitudes, unforgiveness, anger, doubt, fear, etc. Why? Even just a small portion of any of this "heart FOD" can seriously damage our emotions, cripple our perspectives, sour our attitudes and ruin our relationships.

Keep and guard your heart with all vigilance... Proverbs 4:23

Don't you know that a little yeast works through the whole batch of dough? 1 Corinthians 5:6

Whoever keeps the whole law and yet stumbles at just one point is guilty of breaking all of it. James 2:10

THE BOTTOM LINE? Small things can be very destructive. We need to be aware of the power of every thought, every attitude, every word, every fear, every choice and every action. A seemingly insignificant thing, left unchecked, can grow into something very big and harmful within a very short period of time.

Don't let things go. Don't allow emotional "slivers" to become infected. Forgive everyone for everything. Ask for forgiveness and make restitution where necessary. Care about others. Live with a clean, FOD-free heart. And, be encouraged that - because of the relationship with Himself that He has made possible - God can repel or repair any damage caused by any destructive thing of any size that has been or ever will be encountered. ■

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