

# TerranearPMC Safety Share

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Zero Accident Philosophy: ZAP. This is the concept that all accidents are preventable. At the same time, there are many that say the Zero Accident Philosophy is strictly a lofty goal and realistically speaking, can never be achieved. Maybe for a limited time, but the ideal of ensuring a 100% accident-free environment for an unlimited time period is strictly a goal in which we may merely strive for but cannot be realistically achieved or maintained indefinitely.

An example that is used to support that ZAP is strictly a goal for which an organization should strive, but is strictly an ideal, is the famous event of flight Cactus 1549 on January 15, 2009, out of New York's LaGuardia Airport. An event that made national headlines followed by the Hollywood movie, "Sully." U.S. Airway's Airbus 320 just took off and was suddenly (and unexpectedly) struck by a flock of Canada geese at an altitude of 2,818 feet (859 m) about 4.5 miles (7.2 km) north-northwest of LaGuardia. This caused both aircraft engines to fail, which eventually caused the plane to land in the Hudson River; between the island of Manhattan and New Jersey.

And while Captain Sullenberger (aka Sully) through years of experience and expertise, was able to perform a remarkable landing on the Hudson with all passengers and crew safely intact, this incident was indeed, an accident. In the world of S&H, an accident is defined as "an unwanted and unplanned event that results to injury or illness to a person or damage to property." Yes, all passengers survived this harrowing experience, yet there were a few persons that did sustain injuries and were taken to a local hospital for treatment. In addition, the plane – as property, obviously sustained damage (the plane was lifted out of the water by salvage teams). As such, the incident known as "The Miracle on the Hudson" was indeed, an accident – one that, outside of removing all birds from the sky (not a very feasible control method) was out of the hands of anyone to prevent.

And as we have all been made aware, the world, once again, witnessed another aircraft incident; one in which was by far more tragic than in incident told in the movie, "Sully."

The crash of Ethiopian Airlines Flight 302 on March 10, 2019 came less than five months after a Lion Air Boeing 737 Max 8 — the same type of plane — plunged into the Java Sea minutes into the flight from Jakarta, Indonesia. Both planes were new, delivered from Boeing just months before they crashed, killing all passengers and crew. Satellite data shows the recent crash of the Ethiopian Airlines plane's movement was similar to the October crash.

Boeing designed the 737 Max 8 as an updated, more fuel-efficient version of its best-selling 737 aircraft. The Max's engines are bigger and mounted farther forward on its wings; a configuration that could push the nose upward, causing a stall under certain circumstances. An airplane stall is an aerodynamic condition in which an aircraft exceeds a specific critical angle and is no longer able to produce the required lift for normal flight. To compensate, Boeing installed the "Maneuvering Characteristics Augmentation System (MCAS)" to automatically push the nose down when the MCAS sensors detect there is a risk of the plane stalling.

According recent investigation reports, evidence suggests that the plane's stabilizers were tilted upward. Stabilizers are designed to provide stability for the aircraft, thereby keeping it flying



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straight. The vertical stabilizer keeps the nose of the plane from swinging from side to side, which is called yaw. The horizontal stabilizer prevents an up-and-down motion of the nose, which is called pitch.

Because the plane's sensors seemed to have detected the plane to have been tilted upward at an exaggerated angle, the automatic stabilizers, it is believed, forced nose of the jet down. This is similar to the Lion plane crash. This automated system (which may have pushed the nose of the aircraft down) is activated if just one of two sensors mounted on the aircraft's exterior says the nose is too high. That means a single malfunctioning sensor could force the plane in the wrong direction.

Prior to this latest air tragedy, there have been a number of pilots who have complained that Boeing did too little to ensure that pilots or airlines were aware of the new anti-stall feature, or that they were properly trained to understand how to turn off the anti-stall feature if it were malfunctioning or acting on faulty data. Boeing's intention of having the Max 8 design to remain "similar enough" to existing 737 models was to maintain the same aircraft rating. Therefore, retraining pilots that already had proper training on the older 737 models would not be required. This would save considerable money for many airline companies.

In a separate incident that occurred in the in November 2018, a pilot noticed that the autopilot feature became engaged after leveling off from takeoff. In this incident, the co-pilot "called out 'DESCENDING,'" followed by an almost immediate: 'DONT SINK DONT SINK!'" warning. Once the crew disengaged the autopilot, the plane resumed climbing.

While the FAA had issued an emergency directive on Nov. 7, 2018, to help pilots understand how to handle problems with the anti-stall technology, pilots have complained that this directive did not address the systems issues. At the same time, the flight manuals had yet to be updated with information specifying proper handling of the anti-stall technology. It has since been learned that Boeing had two safety features that were designed to detect erroneous readings. One of the optional upgrades, the angle of attack indicator, displays the readings of the two sensors. The other, called a disagree light, is activated if those sensors are at odds with one another. However, these safety features were available only as an option, for an additional cost.

ZAP simply states that accidents can be prevented if hazardous conditions which are recognized prior to an incident are properly addressed. In the case of the Max 8 disasters, through the examination of accident precursors manifested in previous cases, there appears to have been ample opportunity to institute appropriate corrective actions. And as it turns out, such features were available.

Is Boeing or the FAA (for not acknowledging pilot concerns) liable for these disasters? Of course, at this time the information we read maybe based on sensationalism and therefore, a conclusion may be premature. All accident investigations warrant gathering all the facts and therefore, placing inappropriate blame can not only wrongly damage a reputation but allow the true causes of an accident to remain intact; thus, allowing for the same event to reoccur.

**Tact is the art of making a point without making an enemy** - Isaac Newton

