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The Lessons of ValuJet 592

On May 11th, 1996, ValuJet 592 took off from the Miami airport, headed for Atlanta. No more than five minutes into the flight, the pilots radioed back to the Miami airport tower and requested an immediate return to the Miami airport. The radio controller who responded to the call quickly learned that there was smoke in the cockpit and cabin and it was granted immediate return to the airport. However, the plane never made it back to Miami. Sadly, as it attempted to turn around, the aircraft crashed into the Florida Everglades mountains, killing every person on board. What followed this horrific and tragic accident was a deep dive into the current aviation standards, and an attempt to find blame to prevent a tragedy like this from ever happening again.

The plane essentially shattered on impact and landed into a large swamp, damaging much of the evidence and making it difficult to discern the root cause of the crash for a very long time. However, piece by piece, investigators were able to understand the timeline of the crash and determine what caused the fires that led to the deaths of over a hundred people. The author of the article notes that he was impressed with the investigators in that they were able to eliminate the idea that it was an electrical malfunction that caused the fire - which would be the most common cause. It was discovered, through extensive research, that the ValuJet flight had been carrying over a hundred expired chemical oxygen generator tanks in the cargo hold. When deployed, these tanks get extremely hot. When the tanks are expired or no longer able to be used, there are very specific instructions on how to remove the trigger so that they are not accidentally deployed and can be disposed of safely. For this specific group, ValuJet gave the oxygen tanks to their maintenance contractor, SabreTech, along with very specific written instructions on how to safely dispose of the tanks. Workers at SabreTech, for an unknown reason, did not follow these instructions. Instead of removing the trigger, they simply cut it off or taped it down to the can to prevent the cans from being triggered. However, this does not remove the chance that the tank could be accidentally deployed.

This one mistake, however, was not the sole reason for the accident. Once they were incorrectly removed, they were placed in unmarked boxes and left out with no disposal site. They were passed along and moved around, by many people who had no idea the danger that they contained, until finally being marked to be sent back to ValuJet in Atlanta. However, they were marked as empty oxygen tanks, completely neglecting that the tanks were in fact not empty and instead contained hazardous materials. These were then accepted to be placed in the cargo hold of ValuJet 592. The workers who accepted the boxes did not check to ensure that the boxes did not contain hazardous material. All of these events and oversights led to the fire to break out in the cargo hold as a result of one of the tanks being accidentally triggered and heating up its surroundings before causing the fatal fire.

When situations like this arise, we immediately look for someone to blame. In this scenario, there was so much oversight and lack of regulation that led to the accident, that it would be impossible to place the blame on one person. However, oversights and mistakes like the ones that led to this disaster happen every single day. As a result of being human labor, many of whom are overworked, it is very likely that this is not the first time that instructions were not followed to a tee. It is more than likely that this was not the first time that cargo was mislabelled or not checked into as extensively as it should have been. Mistakes are part of life, and it is rare that mistakes like this lead to such a tragic end as ValuJet 592 experienced. Most instances of these common mistakes are not as catastrophic or lead to such a loss of human life as this, but we can learn from ValuJet the best way to respond to disasters and mistakes that we do encounter.

Hindsight is definitely 20/20. It is much easier to say "this would never have happened if X, Y, and Z didn't happen" than it is to catch all possible errors before they happen. Luckily, most of these mistakes do not have as dire of consequences as ValueJet 592 and we are able to learn and grow from these occasions without as many negative side effects. Many of the occurrences from this disaster can be translated and scaled down to a much smaller scale and applied to a software development model. For example, ValuJet wrote very specific instructions on the disposal of the oxygen tanks. This can be equated to a written requirements document. If a software developer were to ignore the explicit directions in the requirements document, it is likely that the program will not work as the owner desired. Taking "shortcuts" that explicitly go against certain instructions will almost always lead to problems down the road.

There is also a common assumption that mistakes will always be found by "someone else". In software development and in many businesses, there is the idea that if someone makes a mistake, there are so many lifelines in place to ensure that those mistakes are found. However, as we can see in the ValuJet scenario, there are certain situations where everyone involved relies on another person to find the mistake, thus the error is never found.

The tragedy of ValuJet 592 was entirely avoidable if only one person had taken the time to do their job correctly or ensure that the person before them had also done their job correctly. Something important in this scenario is the emphasis that ValuJet placed on low costs, which could ultimately have led to the lack of oversight and regulations in what they allowed on their planes. This scenario shows us that no matter how many new regulations or rules are created and implemented after a mistake, it does not negate the consequences that were already caused as a result.

One final part of the article that I noticed is how often the author tells the reader that he is a pilot. He is clearly very proud of his achievement and finds a way to "subtly" drop it into as many paragraphs as he can. It made me laugh.