

## A Cynics Look at Safety Programs By: M.P.Papadakis

*“After the ship has sunk, everyone knows how she might have been saved.”*

*– Italian proverb*

The idea that safety is paramount in aviation is part a Public relations fallacy. Safety is a political window dressing. Safety, The fourth of July and Mom’s apple pie are difficult to bad mouth. Management knows safety is elusive, costly and difficult to market. Name an airline that brags on its safety record ...that is taboo.

In all engineering systems there are myriads of tradeoffs that a designer makes. In the old days engineering was more a hit and miss proposition of try it and see if it works or fails. If it fails it must be done incorrectly so let us redesign and test again.

There was some body of engineering know how recorded and taught at Universities. Almost every year, due to understanding of field and testing failures, new disciplines were created that included the earliest concepts of designing widgets to perform safely in the field.

A free market place and competition demanded that safety be incorporated in designs. It took a while for the obvious seat belt to become mandatory in cars. It took a while to design car fuel tank placements to be less likely to catch fire in survivable crashes.

The reason Safety was slow in developing was three fold. If the product failed too many times the public would buy a more reliable widget from a competitor. If the widget harmed or killed people more than infrequently tort law would apply and added costs of litigation would make the widget unacceptable. The third reason was that it was morally unacceptable to design a risky product and at least not warn of its dangers. Trust me, of the three, morality is a distant consideration

These Lessons evolved over time. Safety has several inherent detractors. They include but are not limited to:

1. How Much safety is enough safety
2. Safety costs money
3. Safety sometimes adds complexity
4. Safety may detract from Utility( product usefulness)
5. Safety in one aspect may detract in another
6. Safety design of our widget may detract from marketing the widget.

7. Safety may take time to accomplish and we lose market share
8. Safety may make widget less desirable and slow down sales
9. Public may not want safety- The reluctance in 1960 to seat belts.
10. If we create a new design for safety does that render old designs defective?.
11. If we design a safer widget and do market it, what about the devices already in the field.
12. The safety device adds unwanted weight.
13. Safety trade offs such as agility to avoid accidents rather than crashworthiness emphasis.

Safety costs a lot to incorporate. In product safety, success is often difficult to define and in particular qualify or quantify.

There is short term safety and long term safety, and new words have crept in like risk and acceptable risk. The goal oriented safety systems all have methods to define their mission and their success. That in turn suggests that some accidents are bound to happen with a certain frequency. The point of the safety is to minimize the risk or make the risk slight enough that the utility of the product is sufficient to warrant its use in spite of the hazards involved.

As an example a Harley Hog is clearly not designed for everyone, nor is a Corvette. You look at these vehicles and you know there are risks involved . At the same time the very enticing aspect of speed and agility beckons large numbers of users.

One, of course can realize, that every entity involved with the safety of the product has a different viewpoint.

The government has formed, over the years, vast bureaucracies who in the realm of safety have dictated rules with the effect of Law. The FAA has the Federal Air Regulations with a myriad of parts. Parts 21, 23, 25, 27, 29, 31, 35 dictate airworthiness standards for aircraft of various categories, helicopters and airships. These are minimum standards a designer must demonstrate for an aircraft to be deemed airworthy (The military services specify their own rules and specifications, and they may also buy off the shelf civilian products and adapt them to military use. The military then decides its own rules for safety compliance through contractual development and production agreements. .

Manufacturers are beset with the trade off problem of meeting Government specification, meeting marketing requests, keeping costs down, keeping weight down etc. One famous CEO of a aircraft company suggested he could indeed make a crashworthy vehicle, but it would weigh so much it would be called a tank and never fly.

Moreover within in the safety business, and it is a business, there are turf wars. Within companies designing new products the question surfaces about how much power the Safety office has delegated to it and, and in particular who the safety gurus report to. The turf wars include when does the safety office become involved? In the old days the safety office was relegated, for the most part, to investigating accidents and reporting findings. Management was tasked to decide what to do about the accident data. The results often resulted in relegating the data to a circular filing cabinet.

The axiom that a squeaky wheel gets the grease was true for safety. The more obvious the accident, the louder the squeak. This in turn results in a more rapid safety response. Regulatory Agencies are always slow acting and turf protective. Thus the large front page accidents get the attention. Apollo One and the two Challenger accidents are case in point. TWA 800 and the Pan Am Lockerbie accident are other examples of massive investigations and safety studies initiated partly because of public attention and National interest and security

The safety process became more refined and the military under the leadership of General Smoky Caldera instituted a new plan adopted by the armed forces that creates two investigation processes. The concept was that one report would be secret -not releasable to the public-which was done for safety and the other was done to place blame. The major difference was that soldiers and sailors were promised that confessions or admissions or error would not be used in disciplinary proceedings. Moreover, manufacturers were asked to participate because of their superior knowledge of the aircraft, and they were given the same silent immunity. The other investigation was releasable to the public.

Back at the factories, companies were being deluged with a clamoring for safety. The local workers unions wanted plant and work place safety. The government agency OSHA dictated minimum standards for the work place. The Environmental Protection Agency was dictating various standards concerning environmental hazards created by factories. The cost of safety was becoming burdensome. The FDA was doing the same in the pharmaceutical areas,

The safety offices, if established by true professionals wanted to expand their territory and power. This is a corporate game called empire building and safety, for the most part, was looked at as an adversary by many other departments of the same corporation.

The safety professional is defined as “an individual, qualified by education, training and experience, who in working with and through others, and following a Code of Professional Conduct, helps to identify hazards and develop appropriate controls for these hazards, that when effectively implemented, prevent occupational injury, illness and property damage.”

Safety had the right to discipline, the right to criticize, the right to recommend and this created situations where Safety was a reactive force, negative to most other departments. It was often thought of as a company department to work around.

At the same time the safety discipline was evolving into a very useful and capable adjunct, helpful in creating useful and safe products.

Every year the Safety gurus advertised themselves in some knew Capacity which appeared gimmicky to the non believers. Inertia to change is universal and the Safety Offices in a frenzy of trying to be universally accepted were forever trying to remake and market themselves to management and to the public.

Of course at time the manufacturer was diametrically opposed to safety. For at least thirty years the Cigarette companies had known that their product caused cancer and other health disorders. They relegated safety to the basement and hired prostitute researchers to say smoking was good. The marketing divisions spent billions to sell slow death in a sexy wrapper.

In aviation sometimes similar results were achieved obtained while people died. A radical V tail aircraft was such an example. Here a manufacturer was able to tell the government that their tail had met CAR part 3 engineering standards and therefore they would not retest the tail to higher standards unless the aviation industry retested all tails to the same higher standard.

Zero defect programs, Statistical Quality control. 110% testing, Quality assurance, Total quality control. Certified safety professional, safety suggestion boxes, Safety rewards programs, Quality control professionals, system safety offices, system safety plans, system safety group meetings,

Bureaucracies have a tendency to multiply enlarge themselves. Large companies are bureaucracies and they too are no different. The code words that management are attuned to liking have to do with success, making money, pleasing shareholders, selling product and staying away from negative publicity. They dislike negative words such as problem, trouble, costly and delayed. In such a frame there is a conflict of interest between marketing that is trying for sales and Safety that is always costly and usually slows things down.

In fact in many companies Safety has been departmentalized so that the trouble and problems they see are not directed to top management before filtering and rewriting safety recommendations. These companies tend to be the Ostrich hiding its head in the sand. Companies interested in safety beyond words direct safety office to report directly to the CEO and the Board of Directors. If you find a

company where safety advice is filtered before reaching the BOD, count on seeing a company that is hiding defective products.

A large aviation company may have several separate facets or subdivisions which may include:

- 1 Plant safety -which is concerned with OSHA and EPA - workplace safety
2. Product safety department that includes:
  - a. system safety group
  - b. A Field service group
  - c. A Warranty work analysis group
  - d. A Safety input to QC, reliability and vulnerability which includes subcomponents and raw material safety and quality
  - e A direct line to CEO

In addition as safety has grown in stature so have the laurels they bestow upon themselves. They hand out trophies of every size and shape that lauds performance in safety. They cover the walls with trophies and diplomas suggesting how safe they are. The walk on water wall is amazing to behold. Every Tom Dick and Harry gives some variety of safety awards. Now Universities vie to hand out diplomas of every imaginable facet of the safety endeavor.

Just as in academia the trophy case, publications and diplomas add up to a title of safety specialist, but these do not always add up to safety. They, in fact may be quite mutually exclusive. Some of the highest paid and best known safety specialists have prostituted themselves to a career pattern of genuflecting in front of management's dollar enticements. It is not a pretty picture. Even Safety Centers have been compromised for political expediency or politics pure and simple

Lets go back to a very early example. The loss of the B-70 bomber "Valkyrie". At the time it was the worlds most expensive and experimental supersonic bomber. It crashed during an unauthorized photo mission to advertise a civilian engine manufacturer's product. There was a lot of pilot and supervisor error. Instead of hanging the participants out to dry, instead of fining the perpetrator company they decided to hand the B-70 pilot aviations highest trophy... "The Collier"

Like Napoleon said, "Give me enough silk ribbon (for medals) and I can conquer the world." Politics and CYA play a very large role in safety when safety is not paramount.

As examples,

1. The military take over of the Gander Arrow Air DC-8 tragedy where army forces were killed due to icing. Department of Transport Canada and the

NTSB were usurped and the result was icing. This on a day where over wing fuelers said there was no wing ice.

2. The Air Force rejects a preliminary finding that suggested a lead pilot of a demonstration team flew his formation into the ground due to pilot error. The accident investigation was re done and not surprisingly the more palatable finding was the aircraft flew into the ground due to mechanical problem.
3. Koch safety awards were being handed out to the Escapac ejection seat until General Gideon's son "Rusty" broke his neck jumping out of an aircraft and an investigation was begun into the seats deadly performance during high speed ejections.. Here the seats low altitude, low speed saves eclipsed the deadly proclivities at high speed.
4. The TWA 800 fuel tank explosion accident was filled with political pressures that concluded a simple fix while bypassing and suppressing several alternative and more specific scenarios. The FBI had also inserted itself early, had foolishly spoken out and suggested terrorism as a probable finding. This made the results less than credible to the public.
5. The Egyptair 990 case suggests that a pilot, for whatever reasons had initiated a high speed dive into the ocean on a trip from New York to Cairo. The Egyptian airline and the Egyptian government believed Boeing aircraft was at fault. Eleven years later it is revealed that political pressures played some part in the investigative process and political sensibilities were included in the probable cause wording.
6. The Air Force shot down in IRAQ of a helicopter carrying civilians was quickly covered up and not called a friendly fire incident it was .This was classic CYA maneuvering by high ranking USAF officials.
7. The Air Force said that Ted Harduvel died because of pilot error and special disorientation. Later it was found that the non releasable accident report had found the attitude indicator in error and the standby attitude indicator defective. This was not what the releasable report had said. As a result the Air Force reconvened the Board and corrected the safety privileged report.
8. The Navy suggested that a Lt. Gray died of pilot error in a Navy S-3 accident on carrier launch. The simple solution was to forget about a defect phenomena in the flight control system of the aircraft. It took an Atlanta Federal District Court Judge to decide differently.

The NTSB accident reports are not bifurcated but the Opinions Conclusions of the full board Probable Cause are privileged and not admitted in evidence in any civil court proceeding. The remaining Factual portions are not excluded from proper use in civil litigation proceedings.

The NTSB has generally speaking no vested interest in the outcome of an investigation. They suggest that they are simply interested in aviation safety. That may indeed be the truth, but it is only part of the story. The NTSB is over worked, under staffed and under trained. They are Civil servants. Many have no flying

background and many are beginners. Worse in the adage of the squeaky wheel gets the grease it is the big media grabbing accidents that maximum effort is directed to resolve.

The Washington based mass disaster “Go” teams are the most experienced and both time money and effort is expended on these accidents. They always result in a public hearing. (Not Egypt air 990)

For a small accident the effort may be a single, young NTSB investigator dispatched to a remote area to oversee himself a few sheriffs deputies and a couple of manufacturer’s representatives. Often the wreckage is quickly picked up and moved to a salvage yard where added investigation may or may not occur. If the small aircraft is lost at sea and or in remote areas the search is called off sooner than a missing small aircraft.

Now celebrity deaths get media coverage and they in turn get vastly different handling than a luckless private pilot who is unconnected to echelons of power. Example of such an investigation was the search for a small aircraft that went missing in Alaska carrying Hale Boggs.

Another example was the recovery and investigation of the single engine aircraft piloted by John Kennedy Jr.

Back to the companies that suggest they are advocates of safety because of having several indicators of Safety on their walls.

Too often persons holding wonderful degrees and licenses to hang on the wall become safety officials used to help make regulatory agencies believe the company is interested in safety and in compliance with regulatory oversight. Often there are various degrees licenses and wall hangings that suggest the facility has been audited shown capable of performing safety, maintenance, quality assurance, inspection ,NDI , or testing at some high level.

There may indeed be paper work documentation of auditing by outside professionals showing that the facility passed with glowing colors. Moreover, there may be paperwork completed to CPA auditing specifications with computer like columns and nary a erasure or a line through mark The may be so perfect in the audit format that you wonder aloud is or was this real. In the Navy such art work was called Gun Decking. Some people think of it as forgery. Does it happen -Bet on it? It happens as frequently as some one goes and buys a diploma from an Onsite website university with a fancy -pretty diploma and some parchment scroll.

One company making welding rods used several thousand tons of contaminated ore and lost most of the paperwork.

Another company in aviation fabricated certification testing on several of their products

Another company that was supposed to use randomly selected test articles instead hid zero tolerance special items and then randomly selected them for testing.

A major supplier of electrical aviation equipment had a head of quality assurance who bought his diploma at a diploma mill.

The point is that simply because a company has a wall full of safety awards. Just because a company has millions of dollars of test and inspection equipment. Just because a company has posters on the walls urging worker safety. Just because there is a system safety plan and just because each aircraft they produce has a Airworthiness Certificate. All that Paperwork protection does not make it safe. Just cuz the government or regulatory agency says it safe -It ain't necessarily so.

Remember, the Titanic was seaworthy...The Challenger was space worthy. And TWA 800 was airworthy. Each had gleaming certificates. Each had been inspected. All were maintained by company's thought the best in the field. Many had enviable safety records; Cunard was a major steamship line. TWA and the Boeing 747 were tried and true companies. NASA was supposedly safety conscious.

In 1988 The Rogers Commission was highly critical of NASA and called their *safety program* ineffective. So what had happened.

The truth be known, a lot of safety was left at the gate when push back and departure occurred.

Each generation of safety enthusiasts come up with new ways to label and package their product. Early on the idea was to employ a registered safety professional. Then there was statistical quality control. Then the discipline was expanded and bifurcated to include Quality assurance. Then the buzz word was Zero defects which implied impossible safety standards.

Then the military introduced System safety discipline into arms and missile production. It spread like a house afire and Mil 882b became the system safety standard of the aviation industry. Civilians followed suit.

Somewhere, Statistical quality became reliability and then came new buzzwords and departments, maintainability, vulnerability, reliability and advanced non-destructive test methods all became important.

**The most recent advent is a concept of Safety Management System**



It is simply is a set of company guidelines for reporting, investigating and analyzing errors. As a concept it is recognized that such a program is designed for each specific company to fulfill individual needs .What works in a NASA clean room, or a factory may be similar vastly different from what is appropriate for say a hospital or a military repair facility. Certain things are identical hazards need be identified,

The SMS discipline gives an organization the tools necessary to determine and measure the risks of various scenarios. With rules and operating procedures, this program provides solutions for a safety culture; most importantly, a collective approach to preventing repeat errors.

The SMS discipline demands contribution and feedback of all employees. This feedback and participation is fundamental in developing strategy and designing procedures to circumvent future errors. To an extent the worker becomes an important and inherent part of a successful safety team. Sounds a little like Deming's concept for total quality

Every such SMS system to be successful begins at the CEO and with Management blessings and encouragement. You should look for a safety plan that delineate clear responsibilities and authority to promote safety through every level within the organization

You should look for a safety plan that delineate clear responsibilities and authority that includes a chain of reporting. In the military look for a a chain of communication and command.

You should look for a safety plan that has an active hazard reporting system.

You should look for a safety plan that has active data collection procedures.

You should look for a safety plan that has an active Incident analysis.

You should look for a safety plan that has hazard identification and risk management.

You should look for a safety plan that has hazard identification and hazard elimination criteria.

You should look for a safety plan that has testing, kit proofing and measurements for showing performance

You should look for a safety plan that has strict document retention.

You should look for a safety plan that has hazard reduction criteria.

You should look for a safety plan that has error, incident and accident reporting systems.

An attorney should realize the program is simply a new and improved way at establishing a safety program. Is it good. Of course the answer is it depends. It is better than no program for safety. It is better than last generations safety programs if it is a living, running, changing and adapting entity

It is feathers not chicken if safety is simply a diploma on the wall, a couple of trophies in the cases on Management's Mahogany Row. If safety is simply paperwork protection, it is no protection at all- it is a public relations fraud

The world now markets this new plan and there are many if not hundreds of supposed safety specialty schools, seminars, courses, books and interactive web programs touting this new save all programs.

Do not be cynical of the paperwork course work program. The knowledge is good. The discipline can work. Safety can be enhanced. The question really is, "Has the knowledge gained through education been instituted and embedded in the corporate philosophy?" The question is has the program leapt from the pages and actually been endorsed by every single employee, in every single action they take while working on the product.

I can tell you one industry, which works very hard at ensuring their production line is intact, running smoothly and with security and safety of delivered product. Go to las Vegas and see how much across the board effort is placed on enduring that every machine in the place is operating reliably and within expected limitations. The goal of course is the maintenance of cash flow direction in a statistically predictable manner from patron to the banker.

Everything in Vegas is designed and applied to that end.. If a Safety management system were applied with the same zeal, the diploma on the wall would translate to enhanced safety...and a few accidents would occur.

Most important for an attorney to recognize is that even in development of a new product safety should be included. Then as the concept moves to prototype testing and production safety and system safety should be, eliminating discovered hazards when the product goes to the field it is some form of the safety office that has cognizance of field problems. It is safety that documents, analyzes and makes recommendations to correct flaws found in the process.

Still and again it is safety that has the first glimpse at whether the product is safe or unsafe. It knows and should report the relative risks to a receptive management. That is true unless System Safety Management is utilized only for trophies and diplomas. It is a great new program but as worthless as many preceding safety methodologies.

SAFETY is a MINDSET adopted and set in active motion. It is not paperwork protection.

The safety investigator must be able to recognize the difference.

