

# FAA Aviation Mx Human Factors Quarterly



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## Upcoming Events

**Do you know of an event that you would like us to share?**  
**Send information to Janine King at [janine.ctr.king@faa.gov](mailto:janine.ctr.king@faa.gov).**

*Editor's Note: These events may have been cancelled or postponed due to the COVID-19 pandemic. Please consult the event website for confirmation before planning to attend these events.*

NBAA 2020 Maintenance Conference

[Hartford, Connecticut \(May 5-7, 2020\)](#)

California International Airshow

[Salinas, California \(June 5-7, 2020\)](#)

RTCA 2020 Global Aviation Symposium

[Arlington, Virginia \(June 16-17, 2020\)](#)

Military Aviation Logistics & Maintenance Symposium

[Dallas, Texas \(September 1-3, 2020\)](#)

WWII Heritage Days

[Peachtree City, Georgia \(September 12-13, 2020\)](#)

MRO BEER

[Istanbul, Turkey \(June 2021\)](#)



Our Request and Promise to You	Author Appreciation
<p><b>Want to share an article, experience, or provide suggestions for the FAA Aviation Mx HF Newsletter?</b></p> <p>Every submission will receive prompt feedback. Our great editors review beyond just spellcheck to ensure that content and format meet the needs of our readers. All feedback is subject to author review and sign-off prior to the publication. Newsletters are published every 3 months (quarterly), starting at the end of March. Submissions made early in the quarter are typically included for the upcoming issue. If you would like to discuss your idea prior to the writing phase, please e-mail Dr. Bill Johnson at <a href="mailto:bill-dr.johnson@faa.gov">bill-dr.johnson@faa.gov</a> for guidance or recommendations. Send your submissions to Janine King at <a href="mailto:janine.ctr.king@faa.gov">janine.ctr.king@faa.gov</a>. If you have any interesting maintenance safety images, please include them in your submission with an image caption. We appreciate your input!</p>	<p>We would like to extend our gratitude to the readers and authors for their continued support of this newsletter. We enjoy your reviews and look forward to future article submissions. Keep up the good work! Our contributors are not primarily responsible for writing articles for this newsletter, however, the vast majority are experts in their fields when it comes to issues related to aviation maintenance. Most importantly, we value their input and reviews that bring interest and value to readers of this quarterly forum.</p>

## Meet the Authors

### Dr. Anna V. Chatzi

Anna is a researcher of aviation maintenance human factors, holding a PhD from the University of Southern Queensland. She is an experienced health professional and a former Army Officer. Her background and past exposure to high-intensity operations has motivated her to work on human factors, having recognized a need for an “outside view” when dealing with seemingly trivial problems. Anna has a growing publication record in aerospace and aviation journals, regularly contributing research and review articles on human factors and safety topics.



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### P.S. Ganapathy

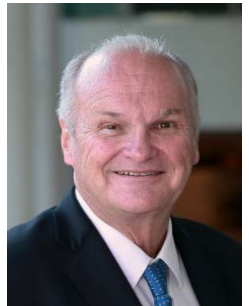
P.S. Ganapathy, M.Sc. and Ae.S.I, is currently a senior aviation consultant with 52 years of flight operations experience in Airlines and Aviation organization. He retired as a General Manager-Flight operations, Air India after 33 years. He later worked in the capacity of Aviation Consultant and Manager Regulatory Compliance, CRM Facilitator in Oman Air and Directorate of Police Aviation, Royal Oman Police in MUSCAT for 13 years. He is presently conducting training to Aviation organizations' pilots, engineers and ground staff on Human Factors and SMS on a needed basis.



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### Dr. Bill Johnson

Dr. Bill Johnson, a frequent contributor to this newsletter, is the FAA Chief Scientific and Technical Advisor for Human Factors in Aircraft Maintenance Systems. His comments are based on nearly 50 years of combined experience as a pilot, mechanic, airline engineering and MRO consultant, a professor, and an FAA scientific executive.



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### Dr. Marc Szepan

Dr. Marc Szepan is a Lecturer in International Business at the University of Oxford Saïd Business School. Previously, he was an executive at Lufthansa. His primary professional experience has been in leading technical and digital aviation businesses in Europe, Asia, and the U.S. Most recently, he served as Senior Vice President, Airline Operations Solutions, at Lufthansa Systems, the IT services business segment of Lufthansa. He also held leadership roles at Lufthansa Technik, the MRO business segment of Lufthansa, and for two other German industrial companies. In 2012, Marc was recognized as one of *Aviation Week & Space Technology's* “40 Under Forty: Rising Stars of Aerospace and Aviation”. Marc received a doctorate in Management Studies from the University of Oxford. He also holds an AM from Harvard University and an MBA from Duke University.



## Together Through COVID-19

Dear Readers,

We are mindful of the impacts the COVID-19 pandemic has and will have on the aviation community. Many of you may be experiencing layoffs or concerns about job insecurity as a result of the reduced flights, while others may want to practice social distancing through telework options that are simply not an option for aviation maintainers. Please accept our deepest appreciation for your continued support of the aviation community. Though we are safely apart, we are in this together. We honor you and thank you for your dedication to airworthiness and safety of aircraft around the globe.

With sincerest gratitude from the Newsletter Team.

## Congratulations Dr. Johnson!

The FAA's Dr. William "Bill" Johnson was awarded the Charles Taylor Master Mechanic Award at the [24<sup>th</sup> Annual Greater Southwest Aviation Technician Symposium](#) held March 5-6 in Phoenix, AZ. Jay Hiles, FAA Southwest Region FSDO Office Manager, presented the award (see Figure 2). Hiles noted that most Taylor Award recipients work on aircraft for over 50 years after receiving their Aircraft and Powerplant (A&P) Certificate. Although "Dr. Bill" received his A&P in the late 1960s, he has not worked exclusively on aircraft since that time. Rather, Dr. Johnson has used his extensive knowledge of human factors and training to help aviation maintainers and to increase organizational awareness of how human factors impacts how maintainers do their jobs.



Figure 1. Bust of Charles E. Taylor, the first aviation mechanic (U.S. Air Force photo by Ken LaRock).

The training products that Dr. Johnson has developed have positively impacted hundreds of thousands of mechanics/engineers worldwide. During his career, he has delivered hundreds of speeches to maintenance audiences in over 50 countries and authored countless publications. He continues to lead the effort for maintenance human factors safety, serving as the key human factors lecturer to all FAA Airworthiness Safety Inspectors and other aviation and human factors audiences worldwide.

Dr. Johnson shared that he was humbled and honored to be accepted into the ranks of mechanics who have spent their careers in aviation maintenance. Dr. Johnson is one of twenty specialized and highly experienced FAA Executive Chief Scientific and Technical Advisors. He and Dr. Katrina Avers, FAA Flight Deck Human Factors Branch Manager, co-founded this Newsletter in 2011, and Dr. Johnson both serves as co-editor and remains a frequent contributor.

Please join the Newsletter staff in congratulating Dr. Johnson on receiving this prestigious award, and in thanking him for his service to the aviation maintenance community!



Figure 2. Mr. Jay Hiles (left) and Dr. Bill Johnson



Figure 3. Dr. Katrina Avers (left), Dr. Bill Johnson (middle), and Mr. Jay Hiles (right).



*Dr. Bill Johnson*

## Overview

Providing quality training and education on the importance and identification of major Human Factors (HF) issues should be a significant part of a highly reliable organization's investment to their employees and customers. HF Training helps address the largest of industrial hazards – human error – thus potentially lowering risk in the organization. Moreover, implementation of HF training and other HF support activities saves money on maintenance-related rework, associated operational delays, and employee injury. The bottom line - it is good for business!

Maintenance HF training programs in the US are largely driven by four factors:

- Worker safety and airworthiness
- Commercial viability - reducing rework, delays, and unwanted events
- EASA Part 145 Repair Station Certification requirements
- 14 CFR Part 5 (SMS mandate for Part 121 operators) requirements to identify and address hazards

This article provides the author's perspective on the history of HF training in aviation maintenance, describing how programs have changed from early emphasis on human capabilities and limitations to an increased focus on organizational factors that affect human performance.

## The Early Years

The first time I taught human factors in aviation was at an accident investigation course at the University of Illinois, Institute of Aviation around 1980. I recall that one of the HF examples I used was the pilot ejection instructions on a Korean-War, US-built fighter jet. I recall that there were only a few steps mounted on the edge of the canopy and they went something like:

- 1) Eject canopy
- 2) Ensure tight shoulder harness; tuck feet and legs
- 3) Pull handle to fire ejection seat

Of course, the flaw in the system design was that instructions for Steps 2 and 3 were blown away when Step 1 was completed. Fortunately, these steps were part

of training and intuitive. These types of design flaws brought to light the need for considering human factors in system design.

During the 1980s an HF course was developed for engineers tasked with building and modifying nuclear plant control rooms. Those courses focused on systems design to match the equipment to the strengths and limitations of the human operator. By the 1990's, similar courses were designed for aviation maintenance HF, with Lufthansa Technik as the first customer.

FAA attention to maintenance HF increased in response to the April 1988 Aloha 737 explosive decompression event, which was attributed mainly to a design flaw and then insufficient maintenance and inspection. Funding from the Aviation Safety Act of 1988 made extensive HF research and development a priority for the FAA. While the explicit 1988 Safety Act funding was time-limited, FAA attention to maintenance HF continues today.

Early aviation maintenance HF training focused on the limitations of the human in the system, and tried to transform trainees (maintenance workers) into physiologists, psychologists, or medical experts. For example, early training contained information on the physiology of the ear, eye, and nose. Looking back, it would have been more beneficial to train proactive measures to protect against health hazards in the workplace.

## Jump Ahead to 2020

Today's attention to HF goes beyond fundamental human physical and psychological characteristics. While we don't ignore human strengths and limitations, we pay more attention to the organization, which is comprised of many humans working as individuals and in groups.

The organizational concept is not necessarily novel. It was partially inspired by Dr. James Taylor's work in the 1980s. He emphasized the criticality of factors in the organizational environment. However, it took a long time for training to shift from the worker-centered way of the past to the organizational-centered focus of today.

Eventually, applied aviation maintenance HF adopted the PEAR Model (see Figure 1., a.; Johnson, 2016; Johnson & Maddox, 2007) to include the consideration of People, the

Environments (physical and social) in which they worked, the Actions performed, and the Resources necessary to accomplish the work.

**“In addition to serving as a useful mnemonic device for remembering the variety of HF topics for consideration, models such as PEAR provide a more organization-centric picture of HF issues, compared to the worker-centric training of the past.”**

A brief history of human factors training would be incomplete without mention of Jim Reason’s well-known Swiss Cheese Model (see Figure 1., b.; Reason, 1997), and Gordon DuPont’s Dirty Dozen (see Figure 1., c.; DuPont, 1997). They were developed in the mid-1990s and continue in use today.

HF training has sensitized the aviation maintenance community to the HFs that contribute to error. Aviation maintenance technicians recognize hazards caused by: human frailties, physical and organizational, and environmental conditions. There is also a keen awareness of the variety of knowledge and skills necessary for safe and effective work; resource limitations regarding tangible resources like tools, parts, and enough qualified

workers; and intangible resources like sufficient time for safe and effective work completion. Recurrent HF training reinforces workforce recognition of many human-related hazards.

This brief summary demonstrates that HF programs have changed over the past 40 years. Today’s emphasis is on managing safety, safety culture, and how individuals work together, to ensure that humans combine capabilities, skills, and attitudes to maximize safety, efficiency, and effectiveness in the aviation maintenance system.

The FAA has been the international leader in the development of materials for maintenance HF training and other HF support material for nearly 30 years. For more information and access to reports, tools, training, and other HF resources, visit the FAA Maintenance HF website ([www.humanfactorsinfo.com](http://www.humanfactorsinfo.com)).

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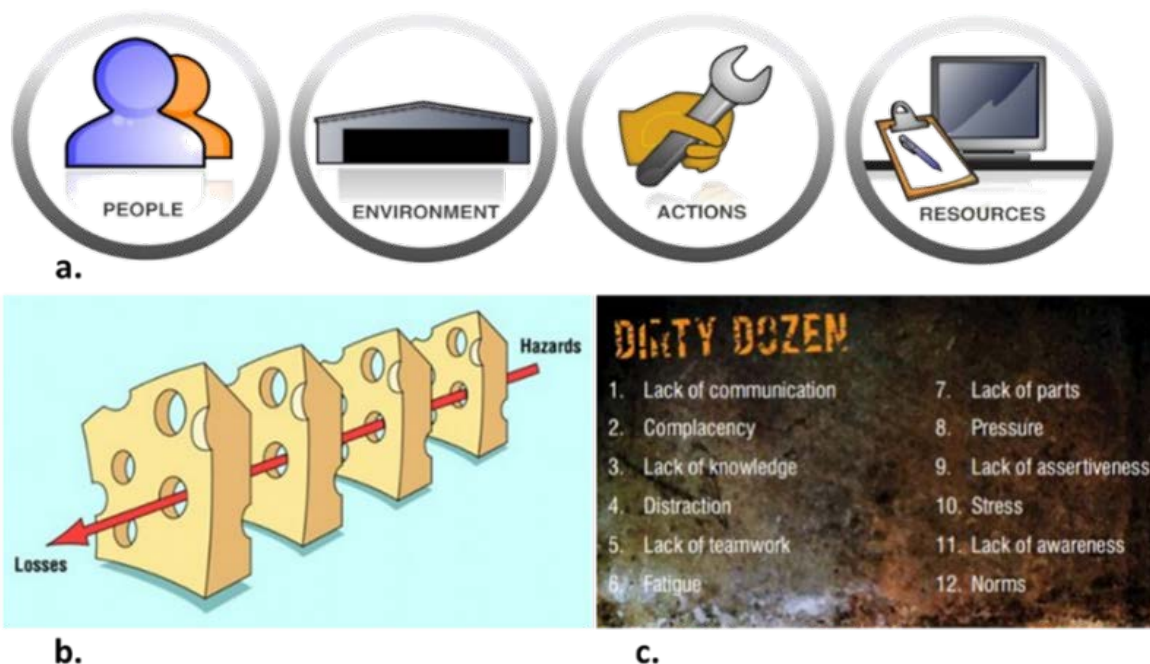


Figure 1. a. PEAR Model; b. Swiss Cheese Model; c. Dirty Dozen Model.

# Attitude is Key to Aviation Safety

*P.S. Ganapathy*

Safety is one factor for success of aviation business in the globally competitive environment. That is part of the reason why safety is given importance in every aspect of aircraft operation and maintenance. In aviation, safety means the “state of an aviation system or organization in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level” (ICAO Annex 19, 2<sup>nd</sup> edition, also see Skybrary [here](#)).

Accidents/incidents do not simply happen, but rather they may be caused by humans working in a system. It has been an established fact for over three decades that Human Error is a main contributing factor in roughly 80% of accidents and incidents. One main influence on individuals’ choice of actions and responses to challenges is **ATTITUDE**. Hence, one way to improve human performance is to understand that prevention of unsafe occurrences lies in understanding, nurturing, and adopting a safe attitude.

In this context, what does **ATTITUDE** mean?

- **Awareness and adherence to rules and regulations** – Rules and regulations are formulated to facilitate safe and efficient aircraft operation and maintenance. They should be considered as resources and strictly complied with for safe human performance at all times.
- **Treating resources with respect and teamwork** – Consider each person to be of equal worth to oneself and utilize every resource irrespective of the source of origin. Remember “**T**ogether **E**ach **A**dds **M**ore”.
- **Thorough knowledge** – Knowledge is power and safety. Half knowledge is dangerous. Investment in training will enhance knowledge and skill.
- **Integrity** – Integrity is doing the right thing even when no one is watching. It has no need of rules. Ensure it is practiced.
- **Time management** – Until we can manage time, we can manage nothing else. Use it to do the right thing. Time management is a skill.
- **Uncompromising about governing values and standards** – Staying firm in governing values and

standards is fundamental to safety. Any compromise on these will lead to shortcuts and dilution of safety, which are not acceptable.

- **Discipline** – Discipline drives you to take the right and safe path and also determines your success. Remember “Excellence is a journey; Discipline is the vehicle”.
- **Evaluation of self and enormous passion for work** – Self-audit and aiming for excellence are tools for consistent improvement. The only way to do great work is to love what you do.

Even highly competent and skillful personnel make mistakes, not due to lack of knowledge but due to their hazardous attitudes.

It is also important to understand why people develop such dangerous attitudes knowing their potentially severe consequences. This understanding will help people to change their mind set and adopt a correct approach to human performance. Some keys to safety are consistent emphasis on dangers of hazardous attitudes, which are human weaknesses, and training on human factors to convert those weaknesses to strengths through adoption of safe attitudes.

A hazardous attitude is like a flat tire and we cannot go anywhere until we change. A safe attitude is like a price tag showing how valuable we are. There are **five hazardous attitudes** which need to be converted into safe attitudes for prevention of human errors:

- **Anti-authority** – “Do not tell me.”
- **Impulsivity** – “Do it quickly.”
- **Invulnerability** – “It won’t happen to me.”
- **Macho** – “I can do it.”
- **Resignation** – “What is the use?”

Murphy Law states “If anything can go wrong, IT WILL”. This law can be rewritten if we change our hazardous attitudes to safe attitudes to enhance safety.

Convert the five hazardous attitudes into **SAFE Attitudes** through the following approach:

- **Anti-authority** – Follow the rules, regulations and SOPs. They are right and safe.

- **Impulsivity** – Slow down. Think first, analyze the options, and then decide the best option.
- **Invulnerability** – Recognize it could happen to anyone. Even highly skilled and competent personnel can make mistakes.
- **Macho** – Taking chances is foolish. There is no competition in safety.
- **Resignation** – You can make a difference in every job. Love what you do and excel at it.

In conclusion, all personnel, particularly those performing safety tasks, must take a resolution to rewrite Murphy's Law into safety law as "If anything can NOT go wrong, it WILL NOT". This requires an **ATTITUDE** change and that is the key to safety.

## The Five Hazardous Attitudes

### Anti-authority

"Do not tell me."

- This attitude is prevalent in people who dislike anyone telling them what to do. These personnel may consider rules, regulations, and procedures to be superfluous.

### Impulsivity

"Do it quickly."

- People with this attitude never stop to think and analyze before initiating action. For these people first thing becomes the best and they respond immediately showing urgency at all times.

### Invulnerability

"It won't happen to me."

- People think accidents will never happen to them. This tendency will lead to taking unsafe risks.

### Macho

"I can do it."

- People with this attitude will always try to establish their superiority over others. This may also lead to them taking risks to give a better impression of their skillset.

### Resignation

"What is the use?"

- People with this attitude will not take the initiative to show that they can make the difference. They will leave it to chance or for others to resolve the situation.

Figure 1. The Five Hazardous Attitudes in aviation maintenance.

## How to Restore Attention to Detail in Safety-Critical Businesses

*Dr. Marc Szepan*

*University of Oxford Saïd Business School*

In aviation and in other safety-critical industries, seemingly small errors can have a disproportionate impact on safety, operational efficiency, and quality perception. Attention to detail matters greatly and, ideally, never becomes a lost practice in the first place. However, at times, even world-class aviation businesses can find themselves in the situation of having to restore attention to detail in parts of their operations. This article

discusses how leaders of aviation businesses can go about doing so.

### Attention to Detail Matters

A single rag left behind in a fuel tank can cause clogging of fuel filters and ultimately shut-down of an engine in flight. A landing gear safety pin not removed before flight usually results in the airplane having to return to field. A



few misaligned spacers in areas visible to passengers can create the impression of shoddy workmanship and thereby negate otherwise positive quality perception (see Figure 1). When doing deep dives into such occurrences, there tends to be a broad range of different technical and human factors-related root causes that suggest different specific preventive and corrective measures. Often, aviation incidents and accidents involve insufficient commitment to such basics as attention to detail. Given the potentially disproportionately adverse impact of seemingly small errors, it is incumbent upon leaders of aviation businesses to get basics right and to ensure sufficient attention to detail across their operations.



Figure 1. Misaligned spacers in overhead panel.

## Beyond Process Improvements

Aviation businesses often attempt to correct attention to detail deficiencies by virtue of beefing up processes, for example by adding additional check and inspection items. Obviously, properly designed processes are *sine qua non* components of the operating, quality, and safety management systems of any aviation business. However, more often than not, process improvements are a necessary but not a fully sufficient condition for restoring attention to detail. This article suggests four additional action areas – above and beyond an exclusive focus on processes and SOPs – that leaders of aviation businesses ignore at their peril. In the interest of mnemonic convenience, I term this simple guide “CARE Checklist”: Culture, Assessment, Resources, and Environment (see Figure 2).

**Culture:** *Does your organizational culture truly value attention to detail?* – Success in business usually is a

function of doing the right things and doing things right. In this spirit, businesses should strive for an organizational culture that values both strategic excellence on the executive floor and operational excellence on the shop floor. Discounting the importance of systematic strategy development would be unwise in any business. However, when facing repeated incidents of lack of attention to operational detail, aviation leaders would be well advised to take an honest look in the (organizational culture) mirror: Does one’s business have an organizational culture that truly values hangar and shop floor excellence? Or one that prioritizes “sexy” PowerPoint jockeying to the detriment of “boring” hangar and shop floor basics? Does one’s company have an organizational culture that values working by the book? In the case of repair stations such documents as Aircraft Maintenance Manuals or Trouble Shooting Manuals. Or does one’s business tolerate, perhaps even inadvertently encourage, taking ethical, financial or operational shortcuts?

**Assessment:** *Is your performance assessment and reward system consistent with valuing attention to detail?* –

There is an old adage that what gets measured gets done. A company’s system for assessing performance and determining rewards – financial or otherwise – can be conducive or detrimental to translating organizational culture into desired operational reality and team behavior. Ideally, both general performance assessment principles and specific key performance indicators (KPIs) should reinforce and reward attention to detail. As a very minimum, aviation businesses need to ensure that there are no perverse incentives that discourage attention to detail. Aviation leaders would be well advised to reflect critically whether a business’ KPIs truly measure and reward attention to detail across its operations. When push comes to shove, are KPIs aligned with doing things the right way and do they reward attention to detail? Or do KPIs incentivize pursuit of TAT, on-time performance or profitability, possibly at the expense of getting right such basics as workmanship?

**Resources:** *Do you provide sufficient resources consistent with attention to detail?* – Setting performance standards without making available sufficient resources for achieving these very performance standards is hardly a winning combination. Even worse, an obvious disconnect between stated ends and given means can easily backfire and result in cynicism among a company’s rank-and-file workforce and in loss of confidence in leadership. Leaders

of aviation businesses need to ensure that they provide resources consistent with the stated objective of putting attention to detail center stage. These can include state-of-the-art physical tooling and equipment or digital productivity tools and IT systems. More often than not, one of the most critical resources is sufficient time for completing an assigned task in line with established best-in-class practices. However, the time that is realistically needed for completing a given task without attention to detail falling victim to undue haste can be considerably longer than stated in applicable OEM documentation. In this context, leaders of aviation businesses should beware of falling into a “penny wise and pound foolish” trap. After all, the cost of a few additional hours needed to complete a task properly is usually relatively minor compared to the cost of an aircraft becoming AOG right after “completion” of a rushed maintenance check or after premature delivery.

**Environment:** *Is the condition of your work environment conducive to attention to detail?* – Human behavior and performance in the workplace are subject to a broad range of drivers. These include intrinsic motivation on part of individual aviation professionals, extrinsic motivation driven by performance assessment and reward systems, the culture of the organization at large, and team internal dynamics. Equally important, human behavior and performance in the workplace often are shaped by the condition of the physical environment of the workplace. Aviation leaders need to ask themselves: Is attention to detail more or less likely to be the norm if one’s team works in brightly lit, well maintained, and squeaky-clean facilities? What about a dark, crummy, and dirty hangar, work shop, warehouse or office? At the risk of belaboring the obvious, it is almost instinctive to pay

## CARE Checklist for Restoring Attention to Detail



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Figure 2. CARE Checklist for Restoring Attention to Detail.

attention to detail when working in an immaculately clean and spick-and-span environment. Similarly, it is much easier to relax one’s own quality standards and to tolerate shoddy workmanship when working in a dilapidated and run-down environment. This low hanging fruit can usually be fairly easily harvested in pursuit of facilitating attention to detail: A well-lit, well-maintained, squeaky-clean, and pleasant (including temperature-controlled) working environment.

### In Closing

In aviation, attention to detail is at the heart of safety, efficient operations, quality perception, and indeed regulatory compliance. Ideally, attention to detail never becomes a lost practice. It is worthwhile noting, however, that great companies are not defined by eternal absence of performance challenges. Instead, world-class aviation businesses are characterized by their capability and willingness to identify, acknowledge, and correct such challenges, if ever they occur. The “CARE Checklist” is intended to be a helpful guide for aviation and other safety-critical businesses that care about doing things right and that might find itself in the situation of having to restore attention to detail in their operations.

# Interpersonal Trust is Important in Aviation Maintenance Practice – But How Important?

Dr. Anna V. Chatzi

*Editor's Note: This Newsletter does not typically publish articles with many references. However, the topics of trust and communication are very important for aviation maintenance. The author's references are high value, especially for our academic and student readers seeking additional information.*

In my research, I have had the opportunity to investigate the positive relationship between communication and trust in the aviation maintenance sector. This was an interesting and rewarding exercise, as it allowed me to understand how aviation maintenance professionals think about their communication within their organizations and their levels of trust towards their professional environment.

It's not a secret that trust is a very important element in enabling successful communication. Take face-to-face communication for example. Personal contact, commitment, and promises are among the means used to establish trust. In groups, the members should share basic ideas and high levels of trust among them. Effective communication then comes naturally. As for organizations, high levels of trust can be achieved when the work environment promotes and allows free-flowing and open communication (Chatzi et al., 2019).

In a recent post, where I was discussing some of the findings of my research, I received an intriguing comment from a non-aviation person: *"Trust is hard to establish when most managers look for someone to blame"*. Blame culture has been debated extensively in the past by aviation experts, and they agree that blame culture discourages reporting and promotes less efficient communication among staff (Dekker & Breakey, 2016). Interpersonal trust has not been investigated adequately in the aviation maintenance sector, but since we now know it is related to communication, we might be able to draw some conclusions indirectly. However, this comment does not refer to management's attempt to make staff accountable for their actions, but rather refers to management's attempt to blame staff unfairly. I personally perceived this comment as an indication of somebody's negative perceptions of their work

environment. So, his comment has triggered a thought (or something we call a 'research question'): is trust related to job satisfaction in aviation maintenance?

Aviation maintainers know well enough that communication and trust are two key tools typically used when troubleshooting and rectifying aircraft failures. Trust is, therefore, an important element of safety culture. Is it an important contributor to job satisfaction as well? Is trust associated with the maintainers' feeling of fulfilment and contentment in their work?

Trust is indicated by many studies as an important element in the interrelationships of colleagues in all industries, and it is related to the quality of the employees' communication (Bachmann, 2003; Carrière & Bourque, 2009; Cascio, 2000; Cho & Park, 2011; Flin, 2007; Muchinsky, 1977; Shapiro et al., 1992; Yeager, 1978). Since we know that communication is related to job satisfaction and productivity, are these outcomes both strongly associated with employees' trust towards their coworkers as well (see Figure 1)? If this is true, then trust is a key characteristic that enables employees to keep themselves happy (by enhancing their job satisfaction) and their managers happy (by enhancing their productivity). In plain terms: I trust my manager, I am happy with my work, and I perform better.

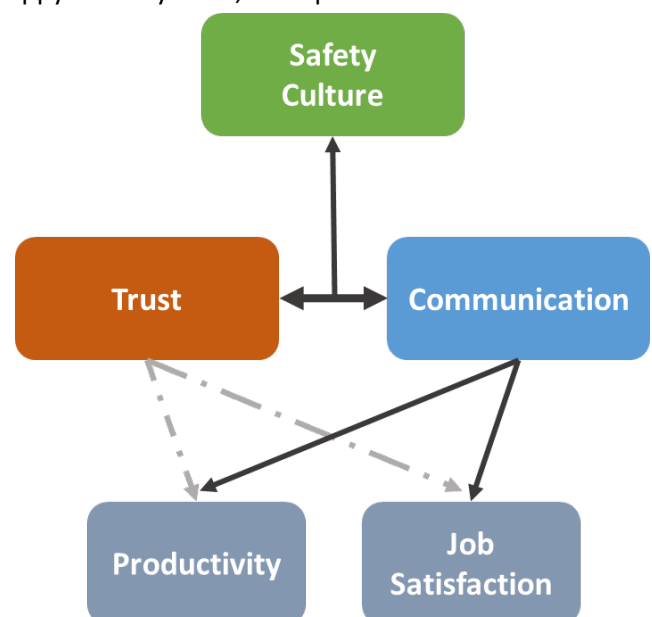


Figure 1. Interrelationships between safety culture, communication, trust, productivity, and job satisfaction. Note that the dotted lines indicate the author's research questions.

But how hard would it be, to establish and maintain a good 'amount' of trust to succeed in both job satisfaction and productivity? Interestingly, the answer could lie in 'high initial trust levels' (McKnight et al., 1998), a theoretical, yet experimentally (and practically) explored theory. This theory explains that whenever new employees enter an organization, they tend to have high levels of trust towards their (new) colleagues and their (new) workplace. From that point on, it depends on the culture of the organization whether trust will be maintained at high levels or not. If, for example, we talk about an aircraft maintenance organization, where safety is valued and a robust safety culture is in place, then trust levels among employees should be nurtured in the organization by:

- a) Using good work practice as an example, offering a feeling of stability and assurance to staff (e.g., a manager that makes fair/right decisions and inspires colleagues to act in the same way).
- b) Not punishing staff when they express isolated views that are contrary to their core values and personal beliefs and take this as an opportunity for further investigation to make things right (i.e., work pressure might be identified as a source of erratic behavior by an employee who is usually very cooperative and punctual. This employee should not be punished for his/her behavior, and provisions should be made to lift this pressure from the work environment).
- c) Allocating time outside working commitments for staff socialization, as this augments positive attitudes within groups (i.e., arrange event parties for employees).

**"...Whenever new employees enter an organization, they tend to have high levels of trust towards their (new) colleagues and their (new) workplace. From that point on, it depends on the culture of the organization whether trust will be maintained at high levels or not."**

High trust levels are vital to communication and satisfaction, and they both contribute positively to job satisfaction, productivity, and safety. Initial high trust levels in new hires is a blessing for aircraft maintenance organizations. It is there, without requiring any action or effort to appear, either from the employee or the organization. Keeping trust high is the real challenge: it takes a lot of effort, commitment, consistency, support, provision of the good example to follow, appreciation of the good values and beliefs of employees, and provisions for staff socialization.

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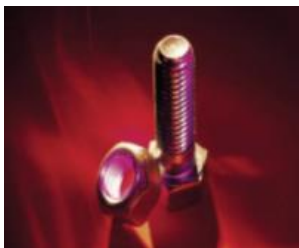
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