Aviation MX
SEPTEMBER 2016
Vol 4, Issue 3
HUMAN FACTORS
QUARTERLY

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A Workshop on Training the Human Factors Trainer

Dr. Bill Johnson

There is a high demand for good Human Factors (HF) trainers. Every Inspection Authorization Seminar, professional meeting, and formal gathering of aviation maintenance personnel dedicates some portion of the program to the topic of human factors. The FAA has a number of Safety Team Program Managers (FPMs) who provide excellent presentations on a multitude of safety and technical topics. This article describes a recent Chief Scientist Workshop created to sharpen maintenance human factors presentation skills of FAAST members. It also shared material and resources for those who teach or speak about maintenance human factors. At the conclusion of the article you will find out how to gain access to all of the information presented at the workshop so that you, too, can utilize these resources.

Planning to Train the Trainer Workshop

We commenced the HF Train-the Trainer (TTT) workshop with a design team that included the Chief Scientist and Technical Advisor (CSTA) program, Dr. Bill Johnson, the Human Factors Branch of the Civil Aerospace Medical Institute (CAMI), Dr. Michelle Bryant, the Department of Transportation Safety Institute (TSI), Mr. D Smith and the National FAA Safety Team (FAAST) Manager – Airworthiness, Mr. Jim Hein. Among the 4, the team had more education-related degrees, military training certificates,

Inside this issue

Table of Contents

1 A WORKSHOP ON TRAINING THE HUMAN FACTORS TRAINER
by Dr. Bill Johnson

4 AIR FRANCE EMBRACES MAINTENANCE LINE OPERATIONS SAFETY ASSESSMENT (MLOSA)
by Drs. Christine Zylawski & Maggie Ma

7 THE TRUTH ABOUT THE CULTURE OF GENERAL AVIATION
by Mr. Jim Hein, FAASTeam Program Coord

10 JOURNAL OF AVIATION MANAGEMENT 2016 RELEASED

10 MAINTENANCE HUMAN FACTORS RECENT AND UPCOMING EVENTS

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Continued from p. 1

and practical teaching experience than most teams of course designers/developers. They recruited about 15 FAA Safety Team members, (see workshop picture), to serve as instructors and beta-students for the workshop where students were also presenters.

The development team developed the workshop to be as much about training delivery and public speaking as it was about HF content. Many FAA Safety Team members already had excellent experience delivering training on a variety of safety topics, including maintenance human factors. Therefore, the primary goal was to enhance their current delivery skill set, develop materials, share resources, and foster instructional methods that would be useful for future TTT and HF courses.

The 2 ½ day workshop had three major sections: Fundamentals of Presenting (Day 1), Presentation of HF Topics (Day 2) and; Applying the Techniques and Topics (Day 3). Everyone in the workshop made at least one presentation and was subjected to written checklist evaluation and discussion. This allowed the workshop to be filled with professional, constructive peer evaluations.

Fundamentals of Presenting

The first day was like a course in a college education department. It is well-known that adults learn by doing and learn best when they know that they must apply that learning immediately. At the very start of the course each student was privately video taped introducing themselves to a fictitious large audience of maintenance personnel. In the 2.5 minutes of video they had to offer the reasons that they were qualified and motivated to teach a HF course. At the conclusion of taping, the group analyzed each introduction. Feedback from attendees shared how challenging it was to face the video camera and speak to an audience of zero. The group decided that the best introductions were made by a speaker who was confident, spoke with passion, and sincerely engaged the audience. Only 1 of 15 presenters went beyond the 2.5 minute time limit. The introduction exercise was rated as enjoyable and of high value by most of the attendees.

The remainder of Day 1 combined both practical information and learning theory. Topics ranged from adult learning theory – called Androgogy, (Inspector Jim Hein), to how to gather information about maintenance human factors issues (Dr. Michelle Bryant). From these presentations it was made clear that there is already a lot of maintenance human factors information available online (humanfactorsinfo.com). One does not have to reinvent the wheel or seek a Ph.D. in Human Factors to deliver an excellent presentation. All believed that the level of detail and theory had to be matched to the audience and to the presenter's ability to describe it and answer questions. Trainers should not try and present at a level beyond their knowledge.

Once a trainer has the right materials they must present the information in a clear, correct, complete, and concise manner. Further, a good trainer must be able to facilitate discussion and keep things interesting. D Smith did just that by capitalizing on years of training experience for US Army helicopter crews and more recently on Accident Investigation, Human Factors, and Safety Management courses for the Department of Transportation. Using a mix of Steve Jobs and Zen-like style, Mr. Smith's 25 slides contained about 50 words in total.

Inspector Keith Frable, former FAA Principal Maintenance Inspector for two of the largest US Air Carriers and 10+ year Adjunct Professor for the Embry Riddle University Worldwide Campus, used the guidance from the fundamentals presentations to deliver training on the FAA's important topic; Risk-Based Decision Making (RBDM). The presentation showed the interdependency between topics like Safety Management, RBDM, and the FAA's new Compliance Philosophy. The presentation also emphasized that a new FAA Flight Standards will look differently at how inspectors use enforcement and how voluntary reporting is changing the way we conduct safety business. The information showed that such changes will increase compliance, communication, and ensure continuing safety.

Day one ended with a a unit on "story telling" that emphasized the value of story delivery in HF courses. Drawing on techniques from TED talks and a lot of HF teaching experience I (Bill Johnson) offered techniques and stories from my 50 years as an aviator trainer. I was quick to claim that my stories are a humble match to the stories from most FAA Safety Inspectors. I transitioned from teacher to learner at the start of Day 2, when every member had an option to tell their own 3 minute story. Stories were evaluated against a list of "tips" for storytelling. The important bottom line of this technique is that instructional stories are as much about delivery style as about story content.

"...a good trainer must be able to facilitate discussion and keep things interesting."

Combining Style and Content

After story telling on Day 2 there was a focus on how to teach specific HF content. Inspector John (Jay) Hiles described the importance about knowing your audience and how to match content and language to the audience. For example, a breakfast presentation to the Rotary Club is quite different than speaking about safety to a room full of experienced airline technicians. Similarly, General Aviation mechanics and owner-operators have different motivations than MRO employees. The good news is that everyone that flies as a passenger or pilot, manufactures or repairs aircraft, or oversees regulatory compliance at some time in their life is interested and invested in the human factors that affect continuing aviation safety.

I believe that you can't have an HF class without revisiting

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Figure 1. Train the HF Trainer Workshop Team from Charlotte, NC; Portland, OR; Seattle, WA; Cleveland, OH' San Francisco, CA; Tacoma, WA; Oklahoma City, OK (4); Riverside, CA; Atlanta, GA; Columbus, OH; Denver, CO; Rochester, NY; and Phoenix, AZ

Continued from p. 2

the PEAR Model. Of course I presented my "one slide" human factors course that included the famous Shell Model, Swiss Cheese Model, Dirty Dozen, Risk Assessment Model, Bowtie Model, and PEAR Model. I shared on the variety of ways a speaker can combine the PEAR Model and story telling so that learners will have an easy way to recall a variety of human factors topics.

During the Day 2 mid-afternoon Michelle Bryant presented the Human Factors Research Division's fatigue presentation. There was quite a debate regarding the appropriate amount and complexity of science necessary in a fatigue lecture. The final resolve was that one must find the match between audience expectation and trainer knowledge and comfort. Most importantly the audience should learn the techniques to recognize and compensate for fatigue. All training relies on excellent media, materials, and clear communication. Inspector Gina Moretto and Steve Keesey covered appropriate design and technical use of PowerPoint features. Inspector Steve Keesey spoke about communication and placed his emphasis on keeping things simple and clear so the audience can understand and remember the most important content and facts.

Applying the Principles to Deliver the Content

Day 3 was "Practical Exam Day," a term familiar to a room full of ASIs/Certified Aviation maintenance Technicians. Ten Inspectors applied the principles of Days 1 and 2 to deliver HF topical presentations. Topics included: Fatigue and Human Error; HF Self-Assessment; Human Factors Accidents; the Aviation Data Exchange; Communication; Work Environment for Visual Inspection; Heat Stress; and more. All speakers were evaluated with checklists that were also used for feedback and discussion.

Day 3 presentations were a positive demonstration that the FAA Safety Team has a lot of HF speaking talent. If you are looking to capitalize on the talent please go to www.faasafety.com to contact your local Safety Team Airworthiness Program Managers. They will match the right workshop graduate to your location and information requirement. FAA HF speakers are qualified and "Open for Business."

More Information and Next Steps

The workshop was a success, based on delegate feedback. People liked the variety of topics and the combination of theory and practice. Most felt that the workshop could have been a couple of days longer. There was a nearly unanimous belief that the course should be an annual offering. All of the content from this workshop will be posted and downloadable from the FAA Maintenance Human Factors Website (www.humanfactorsinfo.com), under "Training Materials."

To access information about the qualifications for a human factors instructor go to: Aviation Mx FAA Human Factors Newsletter. Volume 1 Issue 2, June, 2013. For information about storytelling look to the Aviation Maintenance Technology Magazine, October, 2016.

If you would like a thumbdrive of all the materials available to workshop participants, please contact: 9-amc-surveysupport@faa.gov with the subject line: **TTT** and provide your full name and mailing address.

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Air France Embraces Maintenance Line Operations Safety Assessment (MLOSA)

By Christine Zylawski, Deputy Flight Safety Manager, Air France Industries & Maggie Ma, Ph.D., Maintenance Human Factors, Boeing Commercial Aviation Services

Based on the success of Flight Line Operations Safety Audit (Flight Ops LOSA), the Airlines for America (A4A) Maintenance and Ramp Human Factors Task Force first introduced Maintenance Line Operations Safety Assessment (MLOSA) in 2010. The Federal Aviation Administration (FAA) and A4A have published M/R-LOSA implementation guidelines respectively (DOT/FAA/AM-12/9, 2012; A4A, 2012). Through strictly non-punitive peer-to-peer observations, MLOSA takes snapshots of normal aircraft maintenance operations and helps the organization to understand daily decisions of ordinary people under the influence of normal, everyday pressures. Compared to traditional audits conducted by external agencies or internal safety and quality assurance staff, MLOSA paints the organization a much more realistic picture of what is going on. Using Threat & Error Management (TEM) conceptual framework, MLOSA recognizes that safety threats and errors can never be completely eliminated in normal operations. In addition to identifying safety threats and errors, through sampling, MLOSA data can help to estimate the occurrence probability of those threats and errors, which exceeds the capability of most mandatory/voluntary reporting. MLOSA helps an organization to take the predictive approach in addressing safety hazards, which is required by a Safety Management System (SMS) (FAA, 2016). The predictive capability helps to discover emerging risks that could result as a consequence of future changes inside or outside the organization and its operational environment, and help the organization to stay resilient by applying mitigating actions proactively.

Figure 1. AFI's Three-Phased MLOSA Campaign

Strategically Phased Implementation of MLOSA

Air France Industries (AFI) successfully launched its first Flight Ops LOSA in 2011. In maintenance and engineering, AFI decided to implement MLOSA with two-fold objectives:

- To capture a real picture of day-to-day performance (i.e., operational difficulties, safety threats in unscheduled or scheduled maintenance, and the strategies for dealing with those difficulties/threats)
- To further enhance its safety culture by involving and empowering frontline employees

Assisted by Boeing, AFI launched MLOSA program in November 2014 after a 6-mon careful preparation. The MLOSA campaign has progressed through three phases for three different business units (see Figure 1): Line & Base Maintenance, Component Shops, and Engine Shops.

Phase 1 Completed in the 1st Quarter of 2015 (line & base)

To promote the program and generate buy-in, AFI MLOSA program team attended/conducted more than 90 face-to-face meetings with the frontline employees and union groups. Twenty six highly respected frontline Aircraft Maintenance Technicians (AMTs) volunteered to become MLOSA observers. They were trained by Boeing in a one-day MLOSA observer training, which was composed of theoretical part, classroom practices, and practice observations in the hangars. Based on safety information from event investigations and self-reporting, AFI MLOSA program selected a number of maintenance tasks to focus, such as wheel/brake change, engine change, landing gear servicing, and so on. Over a period of 2.5-mon, the MLOSA observers completed 186 observations and compiled 406 observations reports. A total of 1,500 AMTs in Charles de Gaulle Airport (CDG) and Paris Orly Airport (ORY) were involved in this phase.

Phase 2 Completed in the 2nd Quarter of 2016 (component shops)

AFI spent 4-mon preparing for Phase 2 including the following key activities: (1) getting top management and unions involved, (2) selecting and training

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Continued from p. 4

observers, (3) customizing observation forms, and (4) creating Excel data template for analysis. New "component shop" observation form includes four new sections: Incoming Inspection Check, Disassembly, Assembly, and Fault Isolation & Repair.

Twenty three observers from component shops in CDG and ORY were trained in-house in French due to language proficiency. The observer training was expanded to 1.5-day; and theoretical contents, classroom practices, and field practices each took half a day. AFI MLOSA program team created and integrated new examples that are applicable to the component shop environment. Phase 2 target population included 700 AMTs at CDG and ORY. A total of 301 observations were conducted on tasks such as avionics components overhaul, mechanic/pneumatic/air conditioning/flight controls components repair/overhaul, parts machining, and so on. AFI has received many positive feedbacks from frontline employees.

Phase 3 Planned for the 3rd Quarter of 2016 (engine shops)

Phase 3 MLOSA involves 40 observers from CDG and ORY. They are scheduled to perform more than 300 observations of selected tasks such as CF6/CFM56/GE90/GP7200 engine overhaul, engine Line Replaceable Units (LRUs) repair/overhaul, engine component Non Destructive Test (NDT) inspections, and engine test cell inspections. More than 600 AMTs work in engine shops. The MLOSA program has customized an observation form specific for NDT inspections (see Figure 2).

Progressing through the above three phases, AFI performed safety diagnostic analyses of MLOSA observation data using Excel, statistical software Minitab, and manual analysis in five major steps:

Line/Base Mx forms	Component Shop forms	Engine Shop forms
Demographics	Demographics	Demographics
Planning (A)		**Planning Kitting Phase**
Prepare for Removal (B1)	**Incoming inspection check**	**Incoming inspection check**
Removal (B2)	**Disassembly**	**Disassembly**
Prepare to Install (B3)		
Install (B4)	**Assembly**	**Assembly**
Installation Test (B5)	Installation Test	Installation Test
Close-up/Complete Restore (B6)	Complete Restore	Complete Restore
Troubleshooting/Deferral (C)	**Fault isolation & Repair**	**Repair & Control**
Servicing (D)		**Cleaning, NDT inspection**
Additional threats	Additional threats	Additional threats

Figure 2. A Comparison of MLOSA Observation Forms for Line/Base Maintenance versus Component Shops versus Engine Shops

1. Factors analysis to determine threat and error profiles.
2. Detailed prevalence (frequency) analysis.
3. Statistical testing performed to validate correlations and calculate probability of threats and errors using multinomial logistic regressions.
4. Transposition to AFI risk model (Bow-tie model) to build safety Key Performance Indicators (KPIs) and determine barriers.
5. Setting targets for improvement (recommendations).

Sample Success Stories

MLOSA program helped AFI identify some systematic issues and consequently solutions that can be applied across the fleet. Being the true subject matter experts, the AMT observers were empowered by their observer duties, and helped AFI come up with accurate diagnoses and great solutions for identified problems. For example, based on Phase 1 of MLOSA findings, AFI has improved "Change of oxygen bottle/cylinder" task for multiple aircraft models, e.g., Airbus 320/330/340 and Boeing 777/747. As a part of the integrated approach, AFI completely redesigned its Maintenance Human Factors training with a particular emphasis on "safety strategies for various field situations." Upon completion of the training, technicians will take an AMT Pledge, which is designed to complement existing AFI corporate safety pledge.

Phase 2 of MLOSA implementation in the component shops also produced success stories. For example, old HALON gas sampling tool was found to have poor reliability that subsequently had resulted in unsafe conditions. Through MLOSA campaign, three AMTs came up with a new HALON gas sampling tool that safely takes samples without leaking any HALON (see Figure 3). This employee driven solution meets safety and environment standards.

After surpassing the Baby Boomers in 2014, in the first quarter of 2015, Millennials (adults ages 18 to 34 in 2015) have surpassed Generation X to become the largest share of the American workforce (Fry, 2015). In the 28-member European Union, Millennials accounted for 24% of the adult population in 2013 (Stokes, 2015). By 2020, Millennials will comprise half of the global workforce. AFI has recognized that Millennials are reshaping the workplace. Given their fluency and comfort with technology, Millennials have more of a positive view of how technology is affecting their lives than any other generation. AFI MLOSA campaign revealed an urgent need to optimize the use of ground support equipment (GSE). Tailoring to its main audience, AFI introduced a new instruction system using placards as well as video tutorials on the Techpads (iPads for AFI AMTs) (see Figure 4). The tablet technology makes technical training on how to use a variety of GSE (e.g., nitrogen, hydraulic, air data, oxygen, descaling, etc.) more interesting and unprecedentedly accessible.

At AFI, MLOSA program has introduced a voluntary "bottom-up" process for collecting safety-minded data by frontline technicians. It is a direct reflection of the AFI's commitment and desire to promote and constantly improve its safety culture. Observation data through MLOSA program were transformed into organizational diagnoses of systemic safety issues, as a

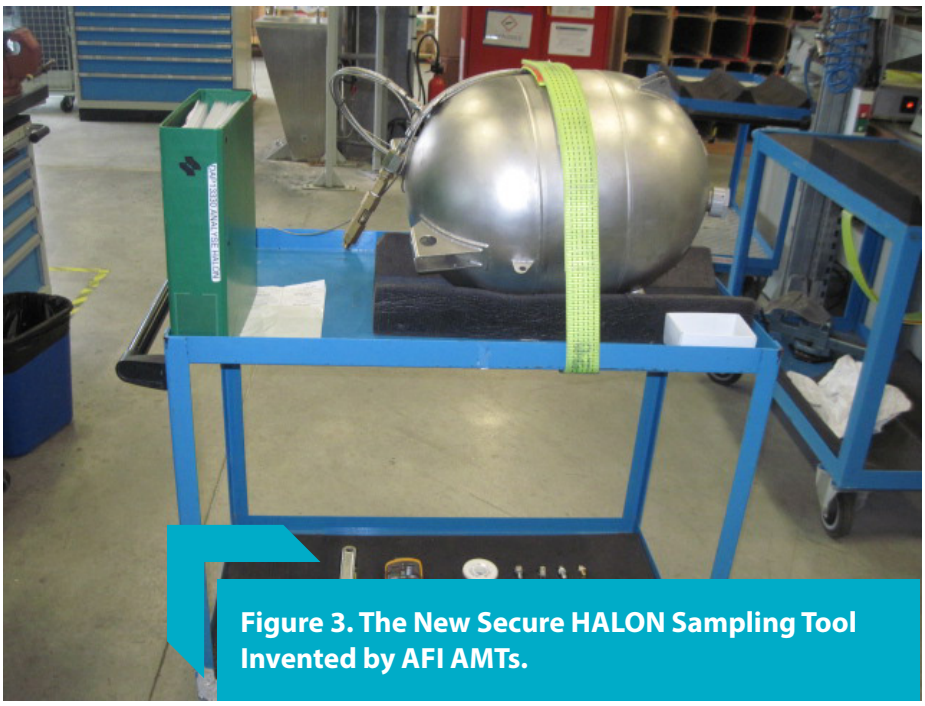

Figure 3. The New Secure HALON Sampling Tool Invented by AFI AMTs.

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Figure 4. A Screenshot of AFI Techpad Training Tutorial on How to Operate a Ground Power Cart

Continued from p. 5

part of organizational self-assessment. Through MLOSA, AFI recognized that field data from normal operations are critical for supporting and improving its SMS.

Future Development

MLOSA success at AFI can be attributed to three things: careful preparation through cohesive teamwork, commitment by the executive management, and enthusiastic volunteer AMT observers.
As the "MRO of the Year" by Aviation Week twice in a row, AFI KLM Engineering & Maintenance hopes to collaborate with other airlines and Maintenance, Repair & Overhaul (MRO) organizations to share de-identified MLOSA data in order to compare and maximize lessons learned from MLOSA program. AFI is willing to share the expanded MLOSA observation forms for Component Shops and Engine Shops with the industry.
AFI is actively examining the potential of connecting Flight Ops LOSA and MLOSA programs since there are overlaps through both sources of data (e.g., mechanic interruption to pilot duties and vice versa). A common Safety Assessment Group will be formed at AFI to assist two sides of the operations to resolve those safety threats.

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AFI New Maintenance Human Factors Training Emphasizes Safety Strategies for Various Challenging Situations in the Field.

SIDEBAR

Post Phase 1 MLOSA observations, the Executive Vice President Air France Industries, Ms. Anne BRACHET reacted to the first campaign:

Involvement of aircraft maintenance technicians in maintenance activities is a key factor to move forward the barrier of Flight Safety. Our first M-LOSA campaign has been a tremendous opportunity to collect safety-minded data to appraise our performance and continue safety promotion within our organization. Commitment deployed by all AFI subject matter experts to develop this innovative initiative supports our common goal to expand our safety culture and therefore demonstrate AFI KLM E&M involvement in Safety Industry Standards.

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The Truth About The Culture of General Aviation

by Mr. Jim Hein, FAASTeam Program Manager – April 2012

The FAA Civil Aeronautical Medical Institute (CAMI), private research, universities, and numerous alphabet organizations have done due diligence with regard to studying and analyzing GA safety. So much so that we have earnestly cataloged nearly all the human factor weaknesses and have identified effective safety net strategies to overcome those limitations. In order to educate the GA flying community we have engaged in FAA sponsor seminars, trainings, published books, and literature that profess human factors best practices and safety knowledge. All of this effort has established practical guidelines that have been effective toward preventing accidents caused by human factors in what might otherwise be a nearly perfect aviation system.

Safety education and promotional efforts conducted by the FAA, private sectors, and alphabet organizations have made a tremendous impact within both the GA community and commercial aviation. Remnants of technical advancements, research, and safety awareness programs are all around us. For more than four decades, we have successfully promoted human factors, better technologies, better surveillance, better aeronautical decision making, etc. The list of fruitful efforts is very long indeed. We must never take away or remove the safety programs that have served us for so long. We must continue to honor those programs, keep them in place, and continue to build on their success. Who knows what the accident rates and safety margins would be today if we had not collectively taken the initiative to teach, learn, and innovate the necessary safety programs, best practices, and safety regulations that are in place.

In fact, since the technology has improved so much and human factors knowledge has redoubled over the past four decades, it's a pleasure to hear GA accident investigators talking more about the human factors involved and less about blaming the pilot. Accident investigation in recent years has gone from finding ways to make our technology better to finding ways to enhance our knowledge of human factors as well as putting that knowledge into practicable policies, procedures, programs, projects, and trainings. These pursuits have actualized efforts which help to protect us from our characteristic human factor defects. This is not surprising since there seems to be no stopping the continued human factors research and technological improvements. However, even with these well thought out safety improvements, I still hear our aviation community crying out and hungry for new safety nets to protect us aviators from the human factors part of ourselves.

There's a safety puzzle piece missing.
Behind this praise of the progress we've made toward safer GA skies, there's one puzzle piece that is glaringly ignored; a piece that has the potential to be the glue that will combine and reinforce all existing safety programs. It's a piece that has more than likely been overlooked because of its simplicity. This puzzle piece is usually perceived as difficult to implement and enforce because of the very set of circumstances it is designed to protect us against; failures due to human factors. This puzzle piece is: Zero Violations.

By definition, violations are deliberate and intentional deviations from the rules, procedures, instructions, and regulations that were developed to foster safe and efficient operations - and/or deviations from acceptable good practice.

Not long ago, I was visiting with a human factors guru whom I'll call Dr. Researcher. Over our extended lunch break he asked me the loaded question, "If you had the resources and ability to create a single program or promotion to improve aviation safety, what would it be?" I'm pretty sure there was an expectation that my answer would uncover which ***human factor*** I thought the aviation communities could jointly pursue in order to make conspicuous progress toward improving safety margins. But my answer was sweet, simple, and pointed. It was low budget and promised to be extremely effective and easy to implement. The idea wasn't strictly human factors; but it encompassed all there is about human factor and then some. As the words "zero violations" came out of my mouth, I heard and saw knowledgeable safety professionals within earshot, smile, groan, laugh, and offer their doubts. I began to sense that my colleagues had the feeling my idea was too simplistic and intrinsically redundant to be effective.

The key about Zero Violations is that it encompasses the notion of refusing to consciously deviate from **any** organizational, personal, and regulatory policies, procedures, rules, regulations, and known best practices. I believe that, by recognizing, integrating, and implementing this well-known and universal safety notion, our aviation communities can

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Continued from p. 7

begin to reverse their cynicism and embrace it. Giving Zero Violations the highest level of importance will deny any minimizing or circumnavigation of every well written and established safety mitigation strategy that already exists . By applying a Zero Violations safety program ,organizations will experience the effectiveness of existing policies, procedures, regulations, and best practices. Individual safety thinking will skyrocket to levels we have never known. Suddenly all of the previously well thought out, documented, and established safety-think will flourish and become maximized.

What sets this safety idea apart from other successful safety ideas?
The increase of individual safety thinking will occur because presumably, without exception, every policy, procedure, regulation, best practice and safety thought (or "Safe Practices Catalog"; SPC) has one common premise; unsafe ***condition mitigation*** (lowering safety risk to acceptable levels). This comes from the ICAO definition of the word safety; which is to lower all safety risk to acceptable levels." That premise is the force that drives a Zero Violations safety program. Since all unsafe condition mitigation strategies, a Zero Violations program would maximize every mitigation effort already in existence.

Is there an intense need for a healthy reporting system that supports Zero Violations?
A most excellent point that I sometimes get from safety program subject matter experts who believe, "It isn't possible for zero violations to occur in an organization that does not have a well-established and functional employee reporting program." The presumption is that an employee needs to have a formal way to report to the organization when a violation decision needs to be made so that the organization adjust their established unsafe condition mitigation strategies and accommodate organizational needs. This is such a strong point that it should be addressed; yet it often ignored until there is an accident or incident.

It is presumed that without a formal, functional employee reporting system, organizations would not know if and when an individual has chosen to or not to violate established SPC items. However, if there is a formal and functional reporting system in place and a worker chooses the not to violate established SPC, the reporting system will automatically and immediately let the organization know about an unsafe condition because the individual will be seeking an acceptable resolution. As an added bonus, this will give the organization the immediate opportunity to make the necessary changes in order to alleviate the unsafe condition situation and make it unnecessary for the worker to make the "violate or not-violate" decision in the future. If the organization does not already have a formal employee reporting program then the implementation of a zero violations program will quickly become the impetus for developing such a system; zero violations and formal/functional reporting programs go hand-in-hand.

So what comes first the chicken or the egg … the zero violations program or the employee reporting program?
The truth is that a formal employee reporting program is an enhancement program for the zero violations safety program because it reinforces a documentation paper trail about the effectiveness of the mitigation strategies and safety nets. A healthy reporting program will quickly indicate if the zero violations program is working. Employees are likely to be making the violation decision several times each hour, day, week, month, year. If every violation decision was documented using a reporting system, then there should be lots of reports generated. If there aren't, either the reporting system is not working or the zero violations program isn't working. These two programs support and enrich each other. However, a zero violations environment/culture in an organization would be self-evident if everyone in the organization embraced the idea and no one in the organization committed a violation or gave tacit approval to commit a violation by others. It is technically not necessary to have a functional reporting program in place for individuals to know that there is a zero violations program is in place. Of course the best practice would be to initiate both of these safety programs simultaneously.

If Zero Violations is so easy and effective, why are we where we are today?
I think that most people already believe that Zero Violations is a good idea. However, for several reasons, there is a set of human factors which we usually don't discuss that hold us (the GA community) back from actualizing the zero violations culture. In his book, The Complete Idiot's Guide to Team Building, A. R. Pell suggested several barriers that hold an organization back from success. These factors look like controllable factors that enable us to commit violations including, Poor Planning, Poor Leadership, Poor Attitude, Poor Rapport, Poor Recognition and Rewards, Personality Conflicts, Lack of Trust, Lack of Self-Confidence, Poor Communications, and Conflicting Agendas. His antidotal methods for achieving a successful change in culture are Flexibility, Equality, Positive leadership, Right training to perform, Keeping promises, and Effective meetings. Simply put; good management practices. Even more simply; Safety Culture.

I was reading the ATA Smart Brief website a few months ago and they highlighted an article that identified 20 reasons a company commonly uses to resist change. The number one reason listed was fear.

Coincidentally, this is not the first time I have heard this, nor is it a new idea. In the 1970s, I took a class in Seattle called The Pursuit of Excellence. That course taught that fear was the single human factor that holds people back from achieving the results that they say they want. Fear of not succeeding or, believe it or not, fear of success. Presuming that the same principles would apply to an organization's culture, what could be the fear in promoting Zero Violations? No doubt there are as many fears as there are organizations and individual aviators, but here are some common ones.

Fear that we'll find out where we've been violating. This, of course, would require change. Once an organization knows where and why the violations are occurring, they've got to do

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Continued from p. 8

something about it. Fixing the situation so that the decision to violate or not violate is no longer necessary could cost money, time, and resources. There is often the temptation for individuals and organizations to "know about an unsafe condition but make the business decision to violate anyway." These situations may make more money in the short-run but are NOT safe and may be very costly in the long-run.

Fear that a Zero Violations program will cost money, time, and resources. An organization may be fearful that if they implement a Zero Violations program, then they will lose their ability to be competitive. However, costs associated with a Zero Violations program will be far less than the cost of one or a series of accidents or incidents.

A Zero Violations program will limit my creative abilities as an aviator. On the contrary, a Zero Violations program would give aviators who are creative the perfect opportunity to address, document, and implement their solutions to trouble areas where the decision to violate was once a requirement to get the aircraft into the air.

Fear of retribution on an individual aviator. Some aviators are concerned that if they refuse to be a "team player" by quietly and dutifully committing a violation and organization may penalize them. This is a sorrowful day if we want to continue to live and work in aviation communities and organizations where one is afraid of not violating SPCs.

These fears lay bare the real issues faced by organizations and their personnel when it comes to a Zero Violations campaign. However, there must be a new paradigm within every general aviation community and culture that no longer allows tacit approval or gives any kind of acceptance to any kind of rationalization that would lead an individual to believe that it is okay to commit a violation …. EVER!! In order to accomplish this, there needs to be a change in our safety climate where each and every individual accepts and actualizes a zero violations mind-set.

Call to Action

Where we need to begin as a combined GA community in the fight for Zero Violations depends on how each organization participates in the system. Here are some generalized suggestions that might be included in every personal and organizational ethic:

- Do not allow anyone within your safety sphere of influence get away with not having a zero violations vision.
- Never provide anyone with any rationalizations that would tacitly give approval or encouragement to commit a violation.
- Learn the signs about when you are personally up against making the violation decision.
- Whenever you are personally pressed to make the violation decision, be strong. Never allow any rationalizations to give you even the most temporary permission to commit a violation.

Final thoughts

The Zero Violations safety campaign by itself is probably not the final panacea to better GA safety margins. There needs to be other safety programs implemented in conjunction with the Zero Violations campaign and they can be discussed later. However, it is important to know that the Zero Violations campaign is only the first drop in the bucket. With that said, a Zero Violations safety program is a very quick hands-on approach that will give every individual in every GA community opportunities to make their individual contribution to improving GA safety margins. Each organization that implements their version of the Zero Violations program will encounter internal levels of safety culture acceptance and resistance. Solutions and supporting programs will need to be tailored to reinforce, maintain, and sustain these efforts.

Why say you or your organization is, "the safest" if you are willing to directly or tacitly give permission to a culture that violates known and accepted policies, procedures, instructions, rules, regulation, and/or best practices? Be honest, if you want to say you're the safest, then by this safety logic, you must never commit a violation.

SIDEBAR

Stay Tuned…

Next issue I will discuss the difference between human error and violations, why good aviators violate, and expand on how to implement change despite fear.

Always report when you are up against the violation decision. Know in your mind what the correction is/should be and insist on a solution that will remove the need to make a violation decision the next time that event is encountered.

Regularly review the violation decisions that have been made by others. Be knowledgeable about violation decision solutions that have been made and how they impact safety.

Be afraid … be very afraid … at least be on guard so that you never find yourself in a violation situation.

Do not be afraid to share your experiences with others about your successes in making the not-to-violate choice.

Encourage others to be zero violation proponents. Support them in making the commitment. Help others to recognize when they are up against the violation decision and support them to make the not-to-violate choice.

If you are in a position within the organization to begin a zero violations campaign, do so post haste.

Be proud to be a zero violation program participant. Encourage others to participate too. Sign the Zero Violations commitment pledge. Keep a copy of it where it will be a constant reminder that you have made the conscious decision to make the not-to-violate choice at all times.

Just say NO … I will not commit violations today.

Comments – Send comments to
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For more information regarding FAAST Team Resources, please visit:
www.faasafety.gov

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JOURNAL OF AVIATION MANAGEMENT

There is now a new one-stop article that describes the Johnson-Maddox PEAR Model. The 2016 Journal of Aviation Management, published by the Singapore Aviation Academy, contains an article entitled "PEAR Model Approach in Applying Human Factors to Enhance Aviation Safety" You can download that article here. The 2016 Journal also contains an article about Collaboration for Safety by NTSB Board Chairman, Christopher Hart.

MAINTENANCE HUMAN FACTORS LAB UPDATE

We are still collecting data from over 300 maintenance technicians across the nation for our sleep study. Thanks to maintenance personnel like you, we have collected a little more than 200 participants with 8 different organizations. We thank you all for your commitment to safety in your contributions. As you'll recall from previous published newsletters, this study is a follow up to a 2001 study conducted by Dr. Bill Johnson, Dr. Steven Hall, and Jean Watson. You can find that report by clicking here. Part of how we collect these data involves participants wearing a sleep monitoring device called an actigraph.

The actigraph measures the amount of movement you engage in while sleeping. From these movements we can gauge how well you slept, the number of times you awaken, and the efficiency of your sleep. These measures are compared to other questions we have for participants to determine the over-all picture of sleep for maintenance personnel. We look forward to diving further into the results.

In addition to the maintenance personnel study, this year we were tasked with examining the fatigue levels of cargo supervisors. Using the same measurement techniques, we were able to publish a technical report on the status of fatigue risk in cargo supervisors. You can find the published results here.

Thank you again for all you all do in the field day in and day out. We are so grateful to get to work on behalf such an awesome group of people. We here in the Maintenance Human Factors Lab truly have the best jobs in the world.

SEE SOMETHING MISSING?

Are you a regular reader of our Mx HF Newsletter? Do you see something we're missing? As always, please let us know! If you have ideas for future articles or would like to contribute, please contact our newsletter staff at: crystal.rowley@faa.gov.

MAINTENANCE HUMAN FACTORS RECENT AND UPCOMING EVENTS

Aviation Safety Management InfoShare Dr. Katrina Avers	September 15, 2016 Kansas City, MO
Rotorcraft Safety Conference Dr. Michelle Bryant	October 25-27, 2016 Hearst, TX
Navy Squadron Safety Stand-Down: A Focus on Effective Communication Dr. Michelle Bryant	November 14, 2016 Tinker AFB, OK
International Conference on Managing Fatigue Dr. Tom Nesthus & Dr. Michelle Bryant	March 20-23, 2017 San Diego, CA
Transportation Safety Institute: Maintenance Human Factors Course Dr. Bill Johnson	January 31-February 2, 2017 MMAC, OK

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