GroundEffects

Reporting Aviation Maintenance and Groundcrew Error Reduction Efforts

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Conference 1996 A Success

by Wayne Glover

Am I at the wrong conference? Perhaps the sign on the door said Star Trek convention not the "Second World Maintenance/ Ground Crew Error Conference"? After all, the keynote speaker, John Nance, was comparing the management styles of fictional starship Captains Kirk and Picard – certainly not what I had expected from this industry expert. However, during his 20 minute keynote speech Mr. Nance did show the significance of this comparison of leadership and communication styles and their effect on safety.

The Second Maintenance/Ground Crew Errors Conference was held January 30 and 31, 1996 in Vancouver, Canada. This conference was arranged by a working committee lead by Gordon Dupont, System Safety - Air Transport Canada. More than 110 aviation people attended the conference, demonstrating an increasing awareness of the importance of maintenance in safe airline operations.

> *"Communications is the river which runs through everything we talk about here today"*
>
> John Nance
> Keynote Speaker

Although Mr. Nance's keynote address was laced with levity, everyone understood the seriousness of the subject – maintenance errors and their effects on aviation safety. Several recent industry studies have shown the significant contribution maintenance errors have had in aviation accidents. One industry study suggests maintenance contributed to 15% of all commercial airplane accidents since 1982, a number considerably higher than many people may have suspected. While this fact illustrates the importance of maintenance, it also emphasizes the role maintenance must play in improving aviation safety. This conference attracted industry professionals determined to reduce this number and improve aviation safety.

In his keynote address, Mr. Nance – commercial pilot, lawyer,

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Conference 1997

Plans are well underway for the third conference to be held in Toronto, February 17 & 18.

Scheduled speakers for this conference include:

- John Goglia, NTSB board member, Keynote Speaker.
- Mike Doiron, Regional Director System Safety, "Ground Damage Costs"
- David Marx , Aurora Safety and Information Systems inc. , "Discipline and Human Factors."
- Alan Hobbs, BASI, "Why Accidents Really Happen"
- Ms. Lee Norvell, FAA Aircraft Maintenance Div., "Discussing Available Safety Posters, Video Tapes, and Courses."
- Bill Sheperd, FAA, and Bill Johnson, Galaxy Scientific Inc., "Human Factors Guide."

For information contact Gordon Dupont at (604) 666-5876 or contact our web: www.groundeffects.org

"I Ain't Gonna Do This Stuff"

by Gordon Dupont

In my years of teaching the 'Human Performance in Maintenance' (HPIM) course, I have witnessed many student reactions but none matched 'Jim" who sat in the front row with his arms crossed and began the class by defiantly announcing to me and the entire class, "I ain't gonna do this stuff." A tough beginning to a class which can be difficult to teach because the subject of human factors covers a wide spectrum and conjures up different images in all of us.

The HPIM course is a two day course developed by Transport Canada and for more than two years has been offered to the aviation industry. The workshop

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Conference 1996

and aviation safety expert – eloquently connected Star Trek Captains Kirk and Picard to aviation safety. Star Trek has beam machines, phasers, and warp drives which today are a flight of scientific fantasy. However, even in star date 5037, the human will still play a central role in all decisions. (Spock and a few androids excluded). Mr. Nance liked the phrase "carbon-based units" used by some Star Trek characters to define humans because to him it helps to show humans are one unit in a complex system.

Contrasting leadership styles, Mr. Nance noted that Captain James T. Kirk was the classic example of a leader who knew everything, always had the answers and people followed – no questions. Picard was a leader who listened to the experts around him, asked questions, then made a decision. Capt. Kirk has an authoritarian style of management; Picard has a more inclusive style. Mr. Nance proffered that we can't afford Captain Kirk's style in our cockpits or our flight lines because it does not promote the

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Discipline and Human Factors

Developing An Effective Discipline Program

by David Marx

Discipline and human Factors

What does discipline have to do with human factors? Everything.

Consider this scenario. Your lead technician has completed the overnight on the turboprop and has just parked it at gate 2 ready for the next day's service. You are both standing out on the tarmac reviewing the day's activities, when you notice the wind beginning to pick up. As you walk toward the terminal, you watch your turboprop start to roll, away from the gate, across the taxiway, and into the grass.

As with most complex problems, the optimal disciplinary approach sits illusively between the disciplinary extremes

If you were not the manager, it might be laughable. Unfortunately, it is your job to investigate — and the chief suspect is standing right next to you. You want so much to find a specific external cause that will relieve you and your employee of considerable shame and embarrassment. Equipment failure, abnormally strong wind, anything but the dreaded human error! Before you can ask Bob what has happened, he mumbles in a high-pitched voice, "Oops, I forgot to chock the airplane."

It is here that the worlds of discipline and human factors come crashing together. Will the airplane in the grass represent a learning experience for the airline or merely a career ending experience for both you and Bob? Take quick and decisive action against Bob and you are guaranteed the learning will be slim. Assure Bob that no disciplinary action will be taken and you may find Bob volunteering some interesting human factors leading to the event. Yet, the flying public, the regulatory authority, your upper management, and perhaps even Bob's peers may be disappointed at the "immunity"

For much of our aviation history, the mishap investigative drill has been 1) take names, 2) administer discipline, and 3) occasionally ask some questions. When human error is found to be the disease, "blame and train" and "time off without pay" have been the prescriptions of choice. Aviation managers expect professionalism and, for many, to make an error demonstrates either a serious training deficiency or a reckless attitude on the part of the employee.

The reality is that we all make errors at a frequency that most of us would not care to admit. While it is simply a part of being human**, employee mistakes are a manageable aspect of our business enterprise**. To actively manage human error, we must implement two specific processes. First, we must implement a system to learn from our mistakes. It is through the lessons of our everyday errors that we can design our work environment to be less error prone and more error tolerant. Second, we must teach our workforce how to manage the contributors to errors that are within their personal control. From stress at home to poor communication with peers, we all have some control over our propensity to make mistakes. These are the two processes we must implement if we hope to better manage error. Yet, neither of these processes can work independently of an organization's disciplinary system.

When our employee is involved in a mishap, we are often faced with the tension between individual accountability and placing the blame on the work system. For example,

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teamwork critical to success in aviation.

Emphasizing the importance of good communication in effective teamwork, Mr. Nance said during his opening remarks, "communication is the river that runs through everything we will talk about today".

Personalizing the importance of communication and teamwork, Mr. Nance told a true story of one of his experiences as the aircraft commander of a military C-141. During a pre-flight briefing Colonel Nance made it clear that this was a team effort and anyone with a safety concern should speak up at any time. Fortunately, one young airman took this to heart. During climbout, the flight crew misinterpreted the clearance from the flight controller and was climbing through their assigned altitude. The young airman questioned Colonel Nance who checked with the controller. The correct clearance was received and the climb was halted just in time to watch the shadow of a 747 cross over them directly in the path of their previous climb. Teamwork works!

This conference had so many experts it is impossible to pick out the stars. The conference speakers had a diverse range of expertise and approaches to aviation safety. Some of the people making presentations were:

- Bob Reavill - McCartney & Reavill Adjusting Corp.: Bob discussed the true costs of uninsured ramp accidents and incident losses which the world airlines estimate at $2 billion US dollars. He believes many of the underlying costs – increased insurance premiums, loss of productivity, and loss of insurance deductible, are not adequately accounted for by today's methods.
- Bill Rankin - The Boeing Company: Summarized the work done with the Maintenance Error Decision Aid (MEDA) tool. MEDA is one method airlines may use to investigate low-level incidents and develop a database of information which may highlight trends and suggest appropriate corrective actions to reduce the likelihood of more major events.
- Gordon Dupont - Transport Canada: Gordon developed a two day course called Human Performance in Maintenance (HPIM) to address the human element in maintenance. This course focuses on how individual reactions to situations involving pressure and stress affect aviation safety.
- Major Mike Gibbs - 19th Wing Flight Safety Officer: Major Gibbs acknowledged that many of the same issues are affecting military aviation, and we can learn from each other.

In addition to "technical' speakers, Gisele Richardson from Richardson Management Associates, spoke of the "softer" side of maintenance safety: the human side, especially communications. Gisele believes "self knowledge is key" to improving safety. Throughout the many different programs Richardson

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Sweet Music

A DC10 arrived on gate from a transcon flight. The new outbound F/E was doing his walkaround. As he was walking past the NR1 engine he stopped and heard music coming from under the cowl. He call maintenance to report this, and of course we all thought 'this guy is crazy'. Well, we went out and couldn't believe it, it was true! We opened the fan cowl, then T/R cowl and there we found a small AM/FM radio taped to a support rod. The radio was close enough to a high pressure duct that it had literally melted and formed itself around this support rod. It was still playing!!! The acft came from an overnight heavy check where the mechanic must have wanted music while worked.
Trouble was, he forgot to remove it!

Be careful out there!

Cinderella in the Flight Department

by Gisele Richardson

Some years ago, flight operations began to discover the value - indeed, the need for - training in human factors for their managers and staff. This training has evolved from a rarity to a regular feature in most flight departments, focusing mainly on flight crews and management. Although the seminars we offer are advertised as useful for flight and ground crews alike, invariably, pilots outnumber mechanics by about five to one in our sessions. How come? Why is this type of training not made available to the same degree in the maintenance departments? Aren't mechanics people too? Don't maintenance directors, crew chiefs, and supervisors need skills to communicate and to manage and to motivate? Don't mechanics too need to learn to deal with stress? Why aren't they getting the same attention the flight groups get?

The answers to these questions, I'm afraid, come to roost squarely on the shoulders of those responsible for the maintenance departments. THEY MOSTLY DON'T ASK FOR WHAT THEY NEED.

You may know that different professions are characterized by different predominant personality profiles. If you doubt it, the next time you go to the National Business Aircraft Association (NBAA) annual show, pause in the aisles and look about you: use your intuition and you will very quickly be able to pick out the pilots from the salesmen (well, not always!), the salesmen from the design engineers, and

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Cinderella

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the mechanics from all the others.

Why? What characterizes the mechanics? We have worked now for more than ten years in aviation departments, and in our experience, these traits at least are found to predominate in the maintenance area: commitment to excellence, willingness to put in effort and hours, integrity, distrust of words, dependability, the tendency to be a loner, modesty (no desire to be in the spotlight), dislikes asking for help, and self-sufficiency. Mechanics think things through on their own and do not share thoughts too frequently or thoroughly. (We have not met many mechanics whose wife says, "I wish that man would shut up and let me get a word in edgewise".)

Most of these qualities are assets – PROVIDING THEY ARE NOT CARRIED TOO FAR. Let's look at self-sufficiency, and the habit of doing your thinking without checking it out with others. It's my contention that both contribute to the one-down role that maintenance too often holds in the flight department. In other words, one of the reasons the maintenance group so frequently finds itself in the position of the second-class citizen in the flight department is because, in a way, it is asking for it.

Speaking to an aviation group some time ago, I said, "When things go wrong, pilots bitch and mechanics sulk." You have all heard about the squeaky wheel. Those who suffer in silence are less likely to get attention. The business of not asking has become a habit for some of you. Let me give you an example. Not very long ago, we were conducting Team Effectiveness programs in a large corporate flight department. The company is one that does not cut corners, and generally responds to reasonable requests from its managers. To our amazement, we found out that whenever pilots and mechanics went to ground school (even when they were together!!), mechanics received a lower allowance for meal, etc., than did the pilots! We made loud and indignant noises about this to the Aviation Manager, only to learn that it was the Chief of Maintenance who established the cost-of-living allowances for his people when they were traveling. The Aviation Manager had no objection to increasing the allowances to match those of pilots; he was simply going along with the Chief of Maintenance's preference!

With that kind of behavior, is it any wonder that Cinderella is pushing out cinders and garbage in the maintenance area while her pilot sisters go to the ball in their brocade gowns? This attitude invites others to see mechanics as less important than other members of the flight department. If you invite people to kick you, there is bound to be someone willing to accommodate you.

This article is an invitation to mechanics, and especially to the managers in the maintenance area, to start rethinking how they perceive their role in the department, the contribution their people make to the company, and the ways they have at their disposal to make sure that they are duly recognized.

Space availability prevents our detailing the myriad of instances where some clarity and assertiveness would serve the maintenance group well: salaries, working hours, technical training, and (given our bias) the fact that mechanics – like other human beings – can benefit from assistance as they find their way in life, just like the rest of us, whether or not they are currently in a period of professional or personal or family crisis. That is to say that employees in the maintenance area require systematic psychological maintenance like the rest of us, and will benefit from any kind of training that enables them to understand human behavior better, to see how they unwittingly contribute to some of their problems, and – most important – to ensure that they find some ways to become comfortable with more appropriate behavior.

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"I Ain't Gonna Do This Stuff"

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covers what we call the "Dirty Dozen" causes of *judgment interference* which lead to maintenance errors. These causes, depicted on a set of posters which are given out as part of the workshop are: Lack of Communication, Complacency, Lack of Knowledge, Distraction, Lack of Teamwork, Fatigue, Lack of Resources, Pressure, Lack of Assertiveness, Stress, Lack of Awareness and Norms. The intent of this course is to offer useful human factors information which can be applied by the individual mechanic or by an entire airline.

I have found that useful human factors training gives the person the reasons why he made the mistake and more importantly, *provides tools to prevent making future mistakes.* At times this has been misconstrued as 'making excuses for that jerk!" Nothing could be further from the truth. This training is simply one way of teaching us to look beyond the easy answer – the mechanic screwed up – and delve further into contributing factors. Not to exonerate the mechanic, rather to gather the information necessary to ensure the mistake doesn't happen again.

In my experience as an aviation accident investigator, the saddest thing I would see, outside of the grieving relatives of the deceased, was the sadness of an aircraft maintenance engineer (AME) who has realized that his actions had resulted in the loss of lives. He'd look right at me and say in all honesty, "I did the best I knew how and I don't know why, but I screwed up" or, "I made a terrible mistake – I knew better – I don't know why this happened." These destroyed looks on the faces of the mechanics are what I keep in mind while teaching this course and dealing with the 'Jims' in my classes. Because: "There but for the grace of God go I".

I have yet to meet the person who deliberately sets out to make an error. Through many examples (some personal), case studies, and team interactions in the HPIM course, it is always exciting to see people begin to understand why the 'jerk' made an error. Some will confess that they have made errors and discuss them. Often they realize that, but for the safety net, they could have been the 'jerk' who caused an accident.

> *"I learned how not to screw up and control my inner child. (He did admit that) It was going to be damn hard to baby-sit my child." "Jim"*

But what of our 'Jims" who had 'been there, done that', many times and "Ain't gonna do this stuff." Each person will get out of the class only what he is willing to put into it. Thus, it is very important that the facilitators have similar experiences and firmly believe in what they are teaching. The participant has to come to realize for himself that good intentions and a high professional standard are no guarantee against errors. But, *knowledge* of what causes often the hardest working person with high ethics, to make an error can enable him to avoid the same mistake. By not fully participating in the workshop these 'Jims' soon realize they are letting down their workshop team. (Peer pressure at its subtle best.)

The HPIM course delves into some psychology because to understand human factors you have to come to understand a little bit about yourself and why you think and do the things you do. This understanding is at the heart of why we make "honest" mistakes. The workshop uses a simplified version of the transactional analysis model to introduce the subconscious and its influences on our judgment. We call this model the "Dupont" model which states: Our decision making mind is divided into two parts: the rational (adult) and emotional (child). When we are born we have only the emotional or child but

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Cinderella In the Flight Department

The first step, of course, is for management in the maintenance area to upgrade their own people skills, and to understand how they limit their ability to use their talents, their experience, their wisdom, and their compassion for the benefit of their people. They need to recognize that they have two roles to play in the organization: to contribute to the success of the flight department, but also to stand up for, to defend, to represent, to develop their own staff. The two are sometimes in apparent conflict. More importantly, the second role too often conflicts with the manager's personal style as described above. Too often, he opts for the first at the expense of the second.

The mechanic has his 50% of the deal too. Does he swallow his frustrations, give up too easily ("I mentioned it to him once five years ago, but he didn't do anything, so what's the use of bringing it up again?"), does he assume – like the person who enjoys being a victim – that "if they really loved me, they would know what I want," or does he state his point of view clearly, does he make his frustrations and satisfactions and preferences known? Does he give his boss the kind of feedback the boss needs to do his job properly and effectively?

Bear in mind that what I am recommending is not revolution but equity and responsibility. It's a psychological coming-of-age of maintenance people in the aviation industry that I am pushing for. It's time to have a bonfire and get rid of what a friend of mind calls "the humbleshit" and give to this excellent group of professionals the position they deserve in the industry. IT'S LARGELY UP TO YOU!

Ms. Richardson is President of Richardson Associates who have provided human factors training to the industry for many years.

Discipline and Human Factors

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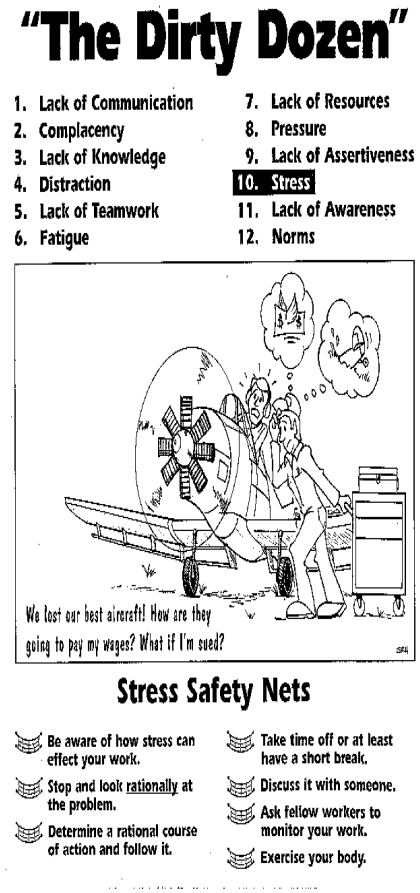
was it Bob or his work environment that is most to blame for Bob's failure to chock the airplane? In each mishap, we will likely find disagreement as to which factors deserve the blame. Most of us feel that disciplining employees in response to honest mistakes does little to improve overall system performance. Yet mishaps accompanied by sabotage, malicious behavior, or intoxication present an obvious and significant problem to today's popular concept of immunity. In these cases, our desire for communication with the erring employee will yield to our sense of right vs. wrong. While the science of human factors can provide great benefit to aviation, some human errors speak more to an airman's professionalism and individual accountability than to his job-induced fatigue or a poorly written procedure.

As with most complex problems, the optimal disciplinary approach sits illusively between the disciplinary extremes. We can say that discipline must be decided on a case-by-case basis, yet this does little to promote reporting by the erring employee. Rather, an organization must distribute its disciplinary rules to its employees so that each person knows where he stands before he reports his error. For example, in the US, the FAA has for many years given immunity to those airmen who report through the Aviation Safety Reporting System (ASRS) provided that the airman's violation of the regulations was "inadvertent and not deliberate." ASRS has worked well by offering a reasonable balance between discipline and communication. It is now time that similar philosophies make their way into the disciplinary practices of airlines, repair stations, and manufacturers. System safety demands that we investigate as many of our mishaps as we can. To do this, we must re-evaluate just how our disciplinary system fits into the equation.

At the next world conference on maintenance errors and their prevention, I've been asked to moderate a one-hour panel discussion on discipline and human factors. The question we'll consider**: What are the attributes of a disciplinary system that both maximizes safety and provides fairness to the workforce?** On the panel, we will bring together a union leader, an airline maintenance safety administrator, a regulatory enforcement attorney, and myself, a disciplinary system designer. While we all share the same desire to maximize aviation safety, it is where to draw the line between discipline and immunity that will most likely generate debate.

I ask that you give this some thought so that you can join the February debate - where do you draw the disciplinary line?

David Marx is the Vice President of



"I Ain't Gonna Do This Stuff"

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as we grow the child slowly moves to the subconscious as the rational or adult develops. But the child is always there to influence any decision made. This model is then developed to show how it influences a person's judgment while at work. It is a very simple but effective model.

The reaction of all participants and the industry has been rewarding to me and to the other volunteer facilitators. We have satisfied training requests from major Canadian and U.S. airlines as well as overhaul shops, helicopter companies and small operators.

So what of 'Jim' who made the headline statement? He got the most of anyone out of the class and on his evaluation he wrote, "I learned how not to screw up and control my inner child." He did admit though that "It was going to be damn hard to baby-sit his child." At least he now had an awareness of what caused him to make an error and how to avoid making future errors.

Don't you wish all AMEs had this knowledge?

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Gordon Dupont is a Special Program Coordinator for Transport Canada. He developed the HPIM workshop in response to the F28 accident in Dryden Ontario

Do You Have a maintenance-related article you you would like to contribute? Please send articles or ideas to:

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John Goglia - Keynote 1997

by: Wayne Glover

John Goglia started in the aviation business over 30 years ago. His career spans maintenance, inspection, and International Aerospace Machinists (IAM) representative, culminating with his appointment in 1995 to the NTSB. Mr. Goglia has been described as a man with a mission to improve aviation maintenance.

He began with flying lessons in J2 cubs but moved to maintenance and his interest in flying waned. He earned his A&P at East Coast Aero Technical School in Bedford, MA. He briefly worked for United Airlines and then went to Allegheny Airlines which, through a merger, became part of USAir. John worked at USAir for many years in several maintenance positions: heavy maintenance, line maintenance and inspection. This diverse background allows him to speak with authority about maintenance because he is one who has "been there; done that." Mr. Goglia's interest expanded beyond line maintenance when he found new opportunities in the IAM union. In the early 1970s the IAM assembled an accident investigation team patterned after the ALPA team. Mr. Goglia served as team coordinator of the IAM Accident Investigation Team and for over 21 years he served as the IAM's Flight Safety Representative. He was the IAM's principal specialist on aviation issues, serving as liaison to the FAA, NTSB, DOT and other executive branch agencies as well as the U.S. Congress. He represented the IAM on the Aviation Rulemaking Advisory Committee, which evaluates and recommends changes regarding aviation safety and operational regulations.

In 1995 President Clinton nominated him as an NTSB board member. He was approved and is now, he proudly points out, "the highest ranking mechanic in government."

Since joining the NTSB, Mr. Goglia has personally reviewed NTSB reports looking for accidents which involved maintenance. Mr. Goglia said, "what surprised me was that the NTSB did not track maintenance involvement in accidents". Mr. Goglia has taken to review all NTSB files looking for the accidents which involved maintenance. He has found "when maintenance is involved, the NTSB did not investigate the event as far as it should have."

To improve aviation safety and allow others to learn from the mistakes of others, he is digitizing NTSB reports of accidents involving maintenance and providing these to training schools and other organizations.

To get an idea of the issues high on Mr. Goglia's list and possible topics of his 1997 speech, I asked Mr. Goglia what he believes are the key issues facing maintenance today. He said the four main issues he wants to address are: communication, complacency, use of maintenance manuals, and shift turnover.

Communication: He believes communication is the biggest issue and runs through many, if not all, accidents. "Over the past 30 years airlines have become high tech but the maintenance department still doesn't know how to communicate with themselves or others." Mr. Goglia believes that, even with all the gadgets, "It still comes down to people talking to people, and we don't do a good enough job of that."

When asked what changes in communication would benefit maintenance he drew on his past experiences as a line mechanic. Occasionally problems would arise during the graveyard shift which would prevent completion during that

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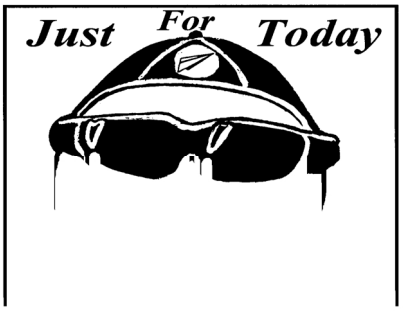
Management offers, communication is always the key issue. She believes human factors training forms the "physiological infrastructure for other training." As one of her clients said to her "(in my organization) We don't communicate; we take turns talking."

This is an exciting time for maintenance human factors. Only recently has this field been given the respect it is due and already many new areas are opening up which – if pressed with vigor – can be used to make aviation safer and less costly. This conference can be a good conduit for information and methods to reduce the role of maintenance in accidents as the entire industry strives towards FAA's admirable goal of "zero accidents".

Conference attendees rated this conference a success and overwhelmingly wanted future conferences. Plans are already well under way for the 1997 conference. The conference will be in February 1997 in Toronto, Canada. We are happy to report the keynote speaker will be NTSB board member Mr. John Goglia. Mr. Goglia is a former USAir mechanic and IAM leader. We are happy to have a person with his maintenance and management experience to be a keynote speaker. (see page 7 for a complete story on Mr. Goglia)



John Goglia

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shift and would delay airplane release. When the maintenance director came to work the next morning, he immediately knew how to solve the problem based on his previous experience. It was apparent he had had this problem before and had been able to solve it. However, his experience was not made part of the maintenance process or maintenance-system knowledge base; preventing all mechanics from benefiting from this information and reducing maintenance efficiency. Referring to this, Mr. Goglia would like to see better communication between floor and top management.

Complacency He believes norms are a big factor in complacency. He spoke of the "We always did it this way why should we look at the manuals?" attitude often taken in maintenance. He believes there is a strong link between complacency and use of manuals. When mechanics become complacent, for example after performing the same task a number of times, one of the symptoms is their belief that they no longer need to refer to the manuals when performing the task.

Use of Manuals Using the manuals, even for tasks which the

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Managing the Ramp for Safety and Savings

by David L. Huntzinger Ph.D., CSP

Accidents and incidents on the ramp take an incredible human and monetary toll on the airlines. There have been a number of serious injuries and fatalities from people falling out of open aircraft doors, being run over by a moving airplane's landing gear or being ingested into operating engines. Minor injuries, while less painful, disrupt the lives of those involved and the company's operations. Unfortunately, there is very little comprehensive, worldwide data on ramp injuries so definitive figures on either accident types or rates are not available.

The financial losses associated with ramp events are staggering. Accidents and incidents on the ramp cost the airlines an estimated two *billion* dollars per year (Smart). For some of the larger airlines the annual costs are upwards of 50 million dollars each. In most cases, the direct costs for individual events fall below insurance deductibles and accident related indirect costs can't be supported by airline's accounting system. Thus, airlines seldom receive insurance reimbursement or adequate third party payments for ramp events. This article provides an overview of an integrated plan for preventing injuries, damage and dollar flow on the ramp. Remember: there are no silver bullets. One of these tools, by itself, is not likely to help you out. Taken together, however, you will have solid, measurable process for managing and improving the ramp.

Improved safety and reduced costs on the ramp? Yes, and it probably comes as no surprise that they are linked together. Reduced ramp accidents equals reduced costs. But why are there so many accidents on the ramp? Take a look at any ramp. Your employees, contract employees, moving vehicles, airplanes; it's a jungle out there. To complicate matters, there is a fairly high turnover in the workforce. This translates into a fairly low experience level for many people. And quite often, the ramp services department is the low critter on the organizational totem pole. They do not command the lion's share of the company's resources. This situation must be managed to reduce accidents.

One of the first steps is to standardize ramp operations. You need to develop a set of best practices and teach them to everyone. This way everyone does things exactly the same way, at every

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Heroic Recovery by Groundcrew

by Larry O'Brien

Definition: Heroic recovery is the activity(s) that ground crews perform to keep a scheduled departure in spite of: late loadsheets, late drop off of mail and cargo, missing mail and cargo, late connecting flights, equipment breakdowns, and lastly, shortages of manpower and equipment before they start the departure process.

Frequency: There is not statistical data tracking done in this area that I am aware of although an educated guess tells me it occurs very often and I wouldn't be surprised if its the new 'norm'.

Recognition: Because this activity happens so often it is an accepted practice or 'norm'. There is never an investigation into these recoveries as operational manager's time and energy is focused on the rest of the operation (putting out 'fires') and investigating actual delays – not delays that could have been. This affects employee morale as they aren't recognized for their efforts in keeping a scheduled departure. More importantly, because there is no investigation, there is no chance of remedying breakdowns in the onload process that necessitated the heroic recovery, and thus the same breakdowns will occur again.

Safety: The loading sequence leading into a departure is based on each person having an allotted time to do their functions safely. Once that time has been shortened for one or more of the reasons that lead to a heroic recovery then in most cases 'shortcuts' are being used (a light onload is the only way a shortened time frame can make up for the lost time). Shortcuts are dangerous unto themselves; let alone if they become the 'norm' and used when there is no heroic recovery required.

Recommendation: We are told we have a good safety program when we reach the stage when we investigate near misses as opposed to spending all of our time investigating the end result of the chain of events – an accident. I would recommend that we treat the heroic recoveries as near misses and investigate them with the same vigor as we do for delays or accident investigations. Is it possible to do this and at the same time bring these heroic recoveries down into a minority end of the operation?

Larry O'Brien is Ramp Safety Coordinator IAM &AW at a major commercial airline.

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mechanic may perform regularly, is the best way to remind the mechanic of the correct steps and to ensure the

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mechanic uses the latest information, not what he remembers from the last time he did the task.

Shift Turnover Say's Mr. Goglia, "We need to find better ways for shift turnover. Turnover methods haven't changed since I started 30 years ago." Inadequate shift turnover procedures have been a continual source of problems.

With his breadth of experience Mr. Goglia will be an excellent keynote speaker and we are fortunate to have him. However, no one can do it alone. This conference can only be successful if you: Attend the conference, bring your ideas, listen to others, and, then use these new ideas and go to work within your airline and the industry to improve maintenance. So, join Mr. Goglia and over 150 maintenance professionals as we work to do our part to improve aviation safety.

Letting the Cat Out of The Bag

by Larry O'Brien

Full recovery? I'm reminded of an anecdote that in some ways deals with an attempted recovery:

A woman arrived at her destination after a lengthy flight and, after clearing customs, made the arduous journey to the cargo warehouse to retrieve her cat that she had shipped on the same flight.

The ground crew arrived at the bulk cargo bin and found a cat that smelled more than usual and didn't move even when prodded. A conclusion was made that the cat was no longer with us. Cargo staff were advised and they proceeded into heroic recovery mode. The cat was brought to the warehouse and delaying tactics were initiated with the cat's owner. In the mean time, the staff called animal shelters and kennels around the area looking for a live duplicate. After several hours of searching, a new cat was found. The substitute was picked up and the swap accomplished. The woman was notified at home and after numerous apologies regarding the airline's service failures she was told the cat was indeed at the warehouse if she would like to come and retrieve it.

The woman handed over her documents and the cat was produced. The cat moved and purred in the cage which startled the woman and she stated in dismay, "that's not my cat. Where is my cat?" The agent replied, while comparing airbill numbers, "Ma'am, this indeed is your cat as you can see from the numbers." The woman's response ended further discussion, "That's not my cat. My cat was dead when I shipped it!"

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gate, on every shift, and at every base. Procedures and standardization have worked very well in the cockpit. The accident rate for the commercial jet transport fleet is about 2 per million departures (Boeing 1996) and on the ramp it's about 670 per million departures (SAS).

Another positive step is to implement a process referred to as behavior based safety (or behavior sampling). This is a relatively new process being used that looks at what is being done right instead of accidents, failures or other breakdowns in the system. Behavior based safety operates on the premise that many accidents are the result of employees making at-risk or unsafe decisions at some point in time. Experience has shown that people often do not know the best or safest way to do things. This method helps people learn the right way to perform at-risk tasks.

Behavior based safety states that any given operation can be broken down into a set of observable and measurable actions. A classic example is lifting a heavy box. You should: 1) face the load squarely, 2) lift with legs, 3) keep load close to body, 4) turn with feet (not torso). A trained observer, usually a peer, records which items were performed correctly on a small check sheet. The items performed correctly are praised. The at-risk behaviors are corrected on the spot.

All of these parameters, especially the "percent-safe", are tracked for progress. If it becomes apparent, through a review of the data collected, that many people are performing one or more of those steps unsafely, an intervention scheme is planned and implemented. Further observations check the effectiveness of the intervention scheme.

These observations sheets form the basis of behavior based sampling and explain why this is a powerful tool. With behavior sampling, a continual record of task performance is achieved. This differs from a program that is compliance based (follows government edicts only) or responds to accidents because it looks at observable actions. With behavior sampling, a dangerous trend in individual task performance can be corrected before the accident or injury occurs.

A few notes about behavior based safety. First of all, this process does not relieve management of its responsibility to provide a safe working environment that includes proper tools and training. Secondly, this is a threat free, non-punitive program. The observations sheets that are scored and tracked have no names on them. It is a measurement tool only. Lastly, this is an investment in time and training on the part of the company and the employees. It is a long term, continuous improvement project. It is *not* a band-aid that is discarded after a short period of time.

The behavior based safety programs have been very successful in industry. There have been a number of articles written on the subject. Most of these are found in safety trade publications like *Professional Safety* or *Occupational Hazards*. Two books, one by Geller and the other by Krause, et. al., address the subject in detail. Your company safety professional will likely have copies of these.

So, you have gotten this far. The ramp operations are standardized and a behavior sampling program is up and running. Safety is improving. The last question is: Are we saving money? This can only be answered if you have an accounting system that tracks both the direct *and* indirect costs associated with ramp events. Direct costs are usually the easiest to count: injuries, parts, labor, repair bills, etc. The hardest part is tracking the indirect costs. These include things like deservicing the airplane (food, fuel, cargo), restaurant, hotel, alternative travel or compensation costs for affected passengers, rental engines, flight tests, overtime, and many other costs. These are substantial expenses (conservatively estimated at about four times the direct costs) and often overlooked or simply accepted as the cost of doing business.

Ramp damage cost accounting should be implemented at the outset of any ramp management effort. These data will provide a baseline from which to calculate improvements. And, if you are pursuing third party payment or insurance reimbursement, the system gives an accurate account of lost revenues. Several airlines have employed similar programs with positive results.

The ramp, while a wild and woolly place, can be managed for both safety and savings. There are tools available, with good measurement capability, to improve operations. As with any dedicated, sustained and successful endeavor it takes solid management commitment to make it work. However, it can be done and the payback, in reduced injuries and dollars saved, is worth the effort.

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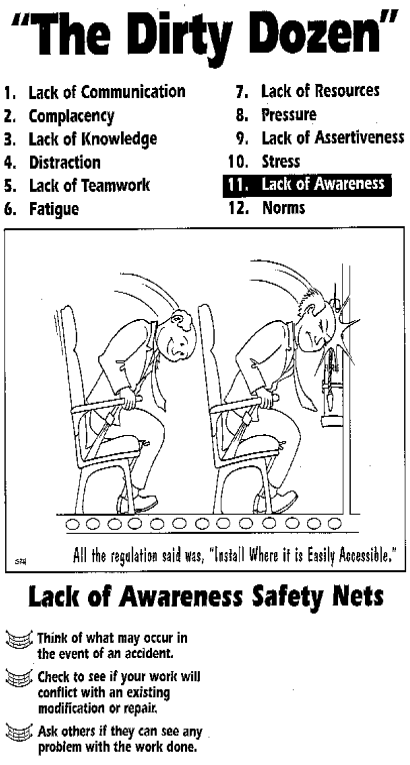

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