GroundEffects

Reporting Maintenance and Groundcrew Error Reduction Efforts

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Editors Note: Our feature article this issue comes from GreyOwl Consultants in Onanole, Manitoba. Written by Richard Komarniski. It is an excellent article on Communication and the importanct of this big factor in Aviation Maintenance. If you would like more information on GreyOwl Consultants. You can visit them on the web at www.greyowl.com.

Communication

Human factors influence an aircraft maintenance technician's good judgement every day. To prevent us from becoming a contributing link to the chain of events that lead to an incident, we have to be proactive and create safety nets.

In attempts to understand the causal factors of an accident, and particularly in efforts to understand the chain of events that precede an accident, one word appears frequently - COMMUNICATION**.** The treacherous human factor of lack of communication can be dealt with without penalizing revenue.

Communication is possibly the most important human factor issue in aircraft maintenance. We spend most of our waking hours communicating. Many people think they are good communicators but what is their relationship like with their boss, their airworthiness inspector, peers, spouse? Relationships depend on communication skills. How many times have you ordered or received the wrong parts or quantities? When was the last time you sent in a malfunction defect report?

WHAT EXACTLY IS COMMUNICATION?

Communication is the exchange of ideas, feelings, or attitudes between two or more people. We communicate continuously in many complex ways. We speak, scowl, write, preach, touch, smile, sit, stand, cry, stare; all of these behaviours communicate an idea. Whether we communicate the intended message or not depends on our effective use of communication skills. "I know that you believe you understood what you think I said, but I am not sure you realize that what you heard is not what I meant."

Studies show we communicate 55 percent by body language, 38 percent by tone of voice and 7 percent verbally. To some of us, these numbers are quite unbelievable! Who's in control of our communication?

As children we communicate freely, but as we become adults we develop shields created from being made fun of - ridiculed, harassed, etc. This

(Con't on page 4)

Annual General Meeting

The AGM was held on May 13, 1999 at the Executive Airport Plaza at 7:00p.m. in Richmond, B.C. Canada It was successful meeting with M.A.R.S.S. members and guests present. In the President's report he commented on how much this little society has achieved in the last 12 months, including the completion of two new videos, Danger Zone and Too Many Cooks, the printing and distribution of the "Magnificent Seven" posters, and the establishing of regular Human Performance in Maintenance Part I training workshops. It was suggested that this years goals include issuing posters in other languages and printing overheads as well as calendars. We will be seeing the "Ramp Safety Posters," available soon as well. The meeting wrapped up with the election of three officers, namely: Bill Foyle, Paul Jenkins and Spence Mikituk.

The present slate of officers are:

John Braund – Executive Secretary
Bill Foyle – Consultant
Paul Jenkins – Canadian Department of National Defence
Spence Mikituk – Canadian International Airlines
Bob Rorison – British Columbia Institute of Technology
Andre Schellekens – SIL Industries

Congratulations everyone and thank you for making up our Board of Directors.

AIR CANADA

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MARSS

Help us to prevent accidents before they happen!

GroundEffects (ISSN 1094-0146) is the official newsletter of **MARSS (Maintenance and Ramp Safety Society)** and is published four times per year to discuss issues affecting maintenance safety. We offer practicable solutions to maintenance managers, regulatory authorities, and unions charged with improving safety and reducing costs.

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The Terrible Odds — An Excellent Tool for Human Factors

Editors Note: Transport Canada is in the process of revising Human Performance in Maintenance. The revised 2 day workshop will utilize the "Dirty Dozen" as the backbone of the workshop but will focus on Jim Reason's Error model. To this end, Gordon Dupont developed an exercise based on Jim Reason's bolt & nut example, to illustrate just how easy an error of omission can occur. Look for the revised workshop to be available this fall and to GroundEffects to give you a full report on it when it is released.

Training Goal: Through the use of a team exercise called the "The Terrible Odds", the participants will realize how easy it is to make an error of incorrect installation and/or omission. They will then develop ways that can be used to lessen the chance of making these errors.

Subject: Error Model

Time Allocated: 30 minutes

Methods to be used:

1. The Terrible Odds Exercise. Each team will take off one nut and one washer as outlined below.

2. Overhead or PowerPoint slide to illustrate the 12 possibilites and the odds

Materials required:

a) One 3/8" x3 ½" carriage bolt. with 8 washers and 8 nuts. Mark each nut with a different number and a mark on one side to differentiate it from the other side. Now mark each washer with a different letter on one side. (A vibropen can do it) Install first a washer than a nut in sequence until they are all on the bolt..

b) An overhead or PPT slide of the 12 possibilities and a second which illustrates the odds of doing it wrong. i.e. 12x12x12etc

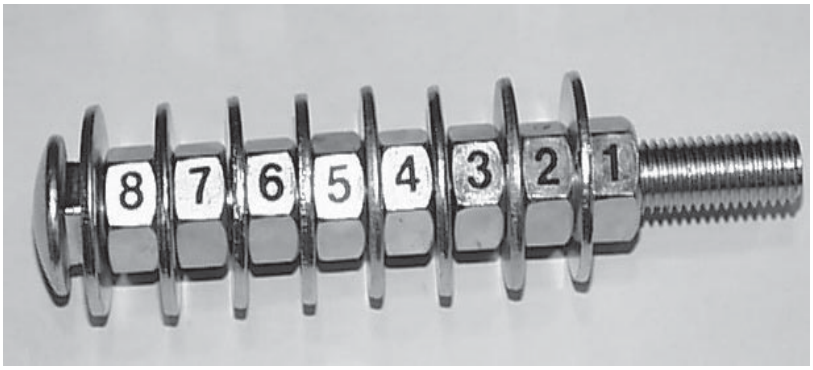

Table of Contents

(Con't from page 2, Terrible Odds ...)

Points to cover:

1. Take the bolt, nut and washer assembly sequenced as detailed below and hand it to the first team.
2. Instruct that team to "look at the assembly and remove one nut and washer" only.
3. Move the reduced assembly to the next table and repeat the instructions.
4. Repeat for each table.
5. Now handout a worksheet or turn to a page in the workbook and have each team calculate or guess the chances of an error being made for each team reassembling just their washer and nut separately. Then the chances of an error with two teams, three teams etc.. Remind them that there is only one way to disassemble the unit and only ONE correct way to reassemble it. Each team can make an error 12 different ways . 1. Washer incorrect, nut correct 2. Washer correct, nut incorrect 3. Washer and nut incorrect 4. Nut installed on 1st correct, washer 2nd correct 5. Nut installed on 1st incorrect, Washer 2nd correct 6. Nut installed on 1st correct, Washer 2nd incorrect 7. Nut installed on 1st incorrect, Washer on 2nd incorrect 8. Washer left off, Nut correct 9. Washer left off, Nut incorrect 10. Nut left off, Washer correct 11. Nut left off, Washer incorrect 12. Both left off.
6. The next team can make the same 12 errors so if they are working on the same unit the odds jump to 12x12 =144, Three teams are 12x12x12=1728. Four teams=20,736 Five teams=248,832 Six teams=2,985,984 Seven teams=35,831,808, Eight teams = 420 million possible ways to do it incorrectly but STILL only ONE way to do it correctly.
7. Now challenge the group to devise ways to lessen the chances of an error of incorrect installation or omission. Some responses to look for are: Training such as this. Strict use of a checklist, worksheet, manual, drawing etc. Mark the part(s) before it's removed. Draw a picture, Take a picture. Think of the possibilities before you start. Ask if in doubt on reassembly.

Overhead #1

The Terrible Odds

Only One way to do it right

But 12 ways to get it wrong

1. Washer incorrect Nut correct
2. Washer correct Nut incorrect
3. Washer and Nut incorrect
4. Nut on 1st correct Washer 2nd correct
5. Nut on 1st incorrect Washer on 2nd correct
6. Nut on 1st correct Washer on 2nd incorrect
7. Nut on 1st incorrect Washer on 2nd incorrect
8. Washer left off Nut correct
9. Washer left off Nut incorrect
10. Nut left off Washer correct
11. Nut left off Washer incorrect
12. Both left off

Overhead #2

The Terrible Odds

Possibilities of doing it wrong

1 Team = 12
2 Teams = 144
3 Teams = 1,728
4 Teams = 20,736
5 Teams = 248,832
6 Teams = 2,985,984
7 Teams = 35,831,808
8 Teams = almost 420 million

But still only one way to do it right

REMEMBER:

– WE are the KEY to safety!

(Con't from page 1, Communication...)

results in us being more cautious communicators. If we are exposed to a negative environment at home and/or at work, we can develop a poor self esteem. Insecurity creates defensiveness, misunderstanding, misinterpretation, hostility and jealousy. If we maintain a positive attitude we will become good communicators because of our high self esteem.

Level of communication is an attitude and communication skills can be changed through a conscious and rational effort. Develop an optimistic attitude about life. If you think today is bad, try missing tomorrow! Remember that no one can make us feel inferior without our permission.

Webster defines communication as "the exchange of thoughts, messages, or information, as by speech, signals, writing, or behaviour. The art and technique of using words effectively and with grace in imparting one's ideas". But really we communicate in our industry to find out how we do something; by asking questions. We discuss company goals with owners, shift goals with supervisors and ask for assistance from peers.

LACK OF COMMUNICATION

As we review aviation accidents we can see where lack of communication has played a major role in them. Either someone was assuming that someone else had done his job, or was not given the proper instructions. In the airline industry all employees need to communicate before, during, and at the end of each task. Information passed along at shift change must cover workload, existing conditions and projected course of action. This makes for the establishment of good continuity - teamwork!

There must be trust among ourselves to have good communication. Living a life of integrity is the best guarantee of maintaining the climate of effective communication. As with all natural processes, there are no shortcuts and no quick fixes. When trust is high, communication is easy, effortless, instantaneous, and accurate. When trust is low, communication is extremely difficult, exhausting, and ineffective.

CASE STUDY

The crash of an EMB-120 operated by a commuter carrier created concerns about the communication between employees on a shift and communication between shifts.

As the aircraft passed through 11,500 feet, it was observed to break up in the air and disappeared from the radar screen. The structural breakup and loss of 14 lives was attributed to the loss of the left horizontal leading edge in flight. But what caused the loss? The answer was obvious: there were 47 screws missing which would have secured the top of the left horizontal leading edge.

The night before the accident, the work packs had been prepared for the midnight shift to replace the left and right horizontal stabilizer leading edges. Toward the end of the evening shift, a supervisor assigned two of his mechanics to begin removing the leading edge, in the not unreasonable belief that an early start would help with the workload of the next shift.

The two mechanics began removing screws from the top and bottom of the right leading edge. They were soon joined by the quality assurance inspector, who climbed on top of the horizontal stabilizer and removed the top right-hand leading edge screws then the left-hand leading edge screws. The supervisor was unaware that work had started on the left side.

The evening-shift work on the airplane was documented on the shift inspector's written turnover sheet. However, the incoming midnight shift inspector reviewed the sheet before the entries were made. The midnight shift maintenance supervisor and mechanics were not verbally informed of the removal of the upper screws on the left side leading edge.

The midnight shift continued with the right side assembly. The supervisor's attention was diverted to an urgent task on a different aircraft; he prudently instructed the mechanics to finish work on the right side only, and to delay starting on the left until the following day. The aircraft was released with a total of 47 screws missing from the left leading edge.

A lack of communication between the two shifts started the chain of events. There was no verbal change over and the worksheets did not indicate that the left top screws had been removed. The evening shift had not documented work that was done on work cards because the package was kept together for the midnight shift.

Better communication, both verbal and written, is a must if accidents like these are to be avoided. Any work done that is not covered on a workcard must be written up. The lack of communication was a result of assuming that both leading edges would be changed that night. Sadly, 14 people paid with their lives for this simple error.

CHAIN OF EVENTS

The National Transportation Safety Board report said that the "Mechanics, quality assurance inspectors, and supervisors, demonstrated a lack of compliance with the approved procedures. Departures from approved procedures included failures to solicit and give proper shift-change turnover reports, failures to use maintenance work cards as approved, failures to

(Con't on page 5)

(Con't from page 4, Communication ...)

complete required maintenance/ inspection shift turnover forms."

As we can see by this case study, there was some assuming that went on. Paperwork was not completed properly after the shift; the work cards were not used to document the work completed by the evening shift; the mechanics did not brief their supervisor.

To maintain aircraft today, paperwork consumes about 25 percent of the technicians' and inspectors' time. At times a mechanic needs to be a mindreader to determine the precise actions that are stated in the maintenance manual; or to visualize the specific malfunction from a pilot's written or oral description. Communication can become a very distracting stress if the tech is experiencing challenges of communication with flight crew, management, dispatch, peers, etc. Communication, when under a lot of emotional stress, creates a loss of focus with the task at hand.

SAFETY NETS

In the mad rush to get out the door at the end of the shift, we have to make sure all work is documented on the appropriate work cards, inspection sheets and logs. Ensure that defects, if they are to be deferred, are deferred properly, and the reason for deferral is clearly stated as per regulatory and company policy procedures.

If work is left uncompleted; are there proper notices, flags, warning placards and documentation indicating the state of the aircraft? If there is a shift change-over diary, has it been filled out properly? Make sure no one has to assume.

Part of good communication is to become a good listener - the old rule of thumb is two ears, two eyes and one mouth, use them in proportion. The more you talk the less you listen, and the more you talk the less others will listen. How many people do we know that have the proportions mixed up? Most of all, communicate to others the way you would want to be communicated to. Good listening results in better communication, safety, and efficiency. It also promotes relationships, improves decision making and creates harmony.

Being a good listener is a skill that we have to learn, it doesn't come naturally. We have to minimize distracting gestures, use positive body language, maintain eye contact. Acknowledge the other person non-verbally (smile, nods) and verbally (asking open ended questions, paraphrasing, summarizing)

× Don't fake attention. It usually fools no one. Whatever is being said should be important enough to listen to.

× Commit to listening. It takes energy to truly focus on the speaker.

× Be alert for nonverbal cues. Facial expressions, vocal inflections, and gestures provide good information.

× Avoid prejudgments. Many people listen with the intent to respond rather than to understand. Don't debate what is being said in your mind.

× Control emotional responses. Certain words may trigger a strong reaction from you, negative or positive. You can listen far more effectively and comprehend more if you keep emotions under control.

× Don't be defensive. Are you really listening or are you planning a counterattack?

× Take notes. Any critical points - write them down.

× Ask clarifying questions. Have you heard what you think was said?

"Seek first to understand, then to be understood" involves a very deep paradigm shift. We typically seek first to be understood. Most people do not listen with the intent to understand; they listen with the intent to reply. They are either speaking or are preparing to speak. Empathic listening takes a great deal of personal security because you open yourself up to be influenced.

The lowest level of communication coming out of low-trust situations is as defensive and protective. It is not effective and creates further reasons to defend and protect. The middle position is respectful communication when fairly mature people interact by compromising. The highest level of communication is when there is trust; this creates synergy.

People with fragile egos are reluctant to ask for clarification when the information is not clearly understood, because they think it may reflect badly on their intellect. The situation can be made worse when equally insecure peers ridicule others for not understanding what was said.

CONCLUSION

Until we cultivate a quality mission statement inside our organization, our efforts to improve communications will have little permanent value. The foundation lies with people and relationships. Effective communication is built on the foundation of trust. When we ignore the foundation, our improvement initiatives will fail or falter.

Keys to effective organization communication are staff meetings held as needed with action-oriented agendas and minutes; employee suggestion systems that reward ideas that result in savings; open-door policies and procedures; and anonymous opinion surveys. Communications systems will function more effectively if they are organized around a shared vision and mission.

Personnel morale is directly proportional to how well employees are informed. They cannot do a satisfactory job unless managers keep them posted on the latest procedures. Managers cannot expect enthusiasm unless they advise employees as to what is going on in the company, and instill

(Con't on page 6)

(Con't from page 5, Communication...)

a feeling of belonging. It is easy to unintentionally give employees the wrong impression by assuming they know, or are not interested. The larger the organization the more difficult it is to keep everyone informed, and yet the larger the organization the more essential communication becomes.

"This is a story about four people named Everybody, Somebody, Anybody and Nobody. There was an important job to be done, and Everybody was sure that Somebody would do it. Anybody could have done it, but Nobody did it. Somebody got angry about that because it was Everybody's job. Everybody thought Anybody could do it, but Nobody realized that Everybody wouldn't do it. It ended up that Everybody blamed Somebody when Nobody did what Anybody could have done."

Over the years we may have created some bad habits in communication. Attention to the way we communicate can make a world of difference in our effectiveness on and off the job. Good communication skills in the long run will save us a lot of time, money and grief. We are good at expressing ourselves when required, but next time you are having a serious discussion remember to listen.

About the Author – Richard Komarniski is President of GreyOwl Aviation Consultants. He has worked as an Aircraft Maintenance Technician for the last twenty-three years holding AME and A&P ratings. Richard has been providing Human Factors Training to various aviation maintenance departements. For information on Human Factors Training or assistance in setting up a MRM program contact Grey Owl Aviation Consultants, Box 233, Onanole, Manitoba R0J 1N0 Canada. Telephone (204) 848-7353, Fax (204) 848-4605.

Aviation Maintenance Human Factors Facilitators Workshop

- Bill Foyle

Have you ever had a couple of days that ended up a total turn-on? It really happened to Gordon Dupont and myself at the Facilitators workshop that M.A.R.S.S. (Maintenance And Ramp Safety Society) put together on the two days following the Canadian Aviation Safety Seminar in May 1999.

I have to tell you that I was a little hesitant when Gord suggested we should co-facilitate this workshop! I told him he could handle it quite well by himself, but he reminded me that Human Factors workshops work better with two facilitators. This would be no different. As usual, he was right!

To show you he reads GroundEffects, not only the main contributor, he took to head the Winter 1998 article by Professor Irene Henley on Problem Based Learning and decided that this would be a good way to run a workshop. Although we only used a portion of the method it worked very well. What I liked about it is that the workshop attendees had to do most of the work.

The group was a great mix, many are already putting on H.F. Workshops and others were setting up to provide this training. We had representatives from Aloha Airlines, B.F. Goodrich, Southern Alberta Institute of Technology, Canadian Airlines, Fed-Ex, Air Nova, British Columbia Institute of Technology, Transport Canada, Rocky Mountain Helicopter and last but not least Dr. William B. Johnson of Galaxy Scientific Corp. I singled out Bill Johnson as I think that he and Gordon, are the Gurus of Human Factors training in Aircraft Maintenance.

We provided the participants with a loose-leaf binder with nothing in it. Well, that's not totally true; there were a few sheets of paper, mostly to write on, a Facilitators Creed, you know the one by Richard Bach – *"Learning is finding out what you already know. – Doing is demonstrating that you know it. – Teaching is reminding others that they know it just as well as you."* We were all learners, doers and teachers. We also had a sheet that told the group who Gordon and Bill were, once more gave our objectives and the rest of the papers consisted of seven problems we wished to resolve.

(Please refer to the article "The Parking Lot". – This article will explain those seven questions and the answers to them.)

(Con't on page 7)

(Con't from page 6, Aircraft Maintenance...)

Well, I have to tell you that with the twenty-one participants working in five groups we came up with 160 separate responses to the above problems. I am not going to list all the responses in this article because they are all listed in the article "The Parking Lot".
Out of a session, such as this one, there is always a "Gem" or two. One of the gems of this workshop was from Charles Dunston of Air Nova, He told us about "The Parking Lot".
It was fun, it was enjoyable and it was a very worthwhile learning experience for me. The responses to the evaluation were very positive and all I can say is "**WHEN IS THE NEXT ONE?"**

• • •

Enclosed in this addition is a program for a Human Factors conference to be held September 8 and 9, 1999 in London, England. One look at the list of speakers will tell you that they have brought together, the top professionals in the world to address the issue of Aircraft Maintenance Human Factors. If you are interested at all in this subject, then that will be the place to be.

• • •

The Canadian Aviation Safety Seminar (CASS)

The Canadian Aviation Safety Seminar or CASS was held in Vancouver on May 10, 11 and 12, 1999. Over 350 persons were in attendance and all were able to come away with something that they will be able to use to enhance safety in their operation.

Sponsored by Transport Canada on an annual basis across Canada, (Next year's is in St. Johns Newfoundland) the CASS has developed into a very inexpensive forum for aviation safety issues to be discussed.

This year's theme of "Error Prevention" was well supported by the program.

The first day's optional workshops were all filled to capacity and well received.

On Tuesday, Dr. James Reason the keynote speaker set the theme with an excellent presentation which said: " While human error is unavoidable, we can set systems in place to reduce these errors to an acceptable level." One interesting comment made was "maintenance on aircraft is an invitation to disaster." The process of removing thousands of pieces off of an aircraft by a large number of persons to carry out an inspection and expect it to be reinstalled, often by different persons than the ones who took it apart, correctly 100% of the time, is asking a lot.

Dr. Stephanie Hamilton, substituting for Dr. Rosekind, gave an excellent presentation on fatigue. We are just now becoming more aware of the errors which fatigue can contribute to.

Dr. C.O Miller gave a presentation on the most significant error in the Aviation System. What is it? Not learning from our past mistakes.

Dr. Robert Waldron provided some case studies, which illustrated what, can occur when the manufacturer commits an engineering error on one of their products.

Bombardier finished the day with a presentation on their products.

Day 3 (Wednesday) started off with Bert Ruitenberg from Holland and the International federation of Air Traffic Controllers (ATC), giving an excellent presentation complete with case studies on what is being done to reduce error in the ATC world.

John Montgomery than made a presentation about his company.

Gordon Dupont provided some thought on how to reduce maintenance error. One strong suggestion was: "train your personnel on how to avoid making the error they don't ever intend to make." Gordon surprised some by announcing he would be leaving Transport Canada in the near future.

David Marx provided an enlightening look at the thorny issue of discipline in light of the need to know when errors are made or almost made. He provided such gems as "never punish for human error just for reckless behavior."

Carol Suggs ended the line of speakers by providing an excellent look at how Petroleum Helicopters utilizes positive reinforcement to reduce their errors. They spend about $1,000,000 per year on safety awards and have calculated that it provides an eight to nine times return on investment in reduced accidents and thus reduced insurance costs.

It was an excellent, well run seminar, thanks in no small part to the hard work of Gaye-Lynn Hattle and her committee. Well Done.

The Parking Lot – The Aviation Maintenance Human Factors Facilitator Workshop

The Maintenance And Ramp Safety hosted a one and one-half day workshop on May 13 and 14 in Richmond, BC. Called "The Human Factors Facilitators," workshop.

The purpose of the workshop was to learn from the other participants and come away with a better understanding of what some of the successful approaches to facilitating human factors training, to aviation maintenance personnel are.

The following have been compiled from the responses to the following seven questions that were posed to the participants.

The Opening Experiment – "The Parking Lot"

"The Parking Lot" is a gem that can be used when doing human factors training.

"The Parking Lot" is a piece of flip chart paper with parking lot written at the top. The purpose of this is to "park" comments such as "We are always short of stands". This comment or ones like it are often made by a course participant. You, the facilitators don't have an answer for the comment so what you do is obtain specifics on the complaint. E.g. Specify what stands we short of? Have you formally requested these stands? What was the response? If it appears to be a legitimate complaint than write it on the "Parking Lot".

This in turn will call for a previous commitment from management to address any and all issues put on the parking lot. The issues can than be addressed by either a person from senior management coming and making a decision. An alternate method can be to write a response that the whole company sees in a newsletter. It is critical that the issues are responded to, once raised. It is also critical that you, the facilitator be sure to get sufficient detail to ensure that it is a legitimate complaint.

Charlie Dunstan of Air Nova provided this useful human factors tool.

The following responses to the seven questions are not in any order of importance. Questions that are alike or are the same will be placed on the same line, with the number of responses in brackets.

There are a lot of "Gems" which you will be able to use. Thank you for helping us discover them and may we continue to discover as a team, ways to make our industry ever safer.

Cheers and may you have a rewarding and safe career.

Gordon Dupont
Safety Consultant

Problem #1

What makes a good facilitator?

Participants Solutions –

1. Believes in what he/she says and shows it in commitment and enthusiasm - strong belief in subject
2. Has credibility (2)
3. Has a good attitude (3)
4. Is Honest
5. Has good listening skills - Is a good communicator - Paraphrases ideas and terms (2)
6. Displays high energy
7. Is open to opinions
8. Is a motivator - promotes discussion - stimulates and motivates
9. Is prepared
10. Is able to encourage participation - Is quick to praise - rewards ideas
11. Has a sense of humor - Makes it fun (2)
12. Has the ability to communicate with various personalities
13. Is able to recognize and defuse potential conflicts
14. Has the ability to think on his / her feet
15. Has flexibility (2)
16. Is humble
17. Has a sensitivity and empathy for all participants
18. Supportive while not being condescending
19. Eager to transmit
20. Able to stimulate and motivate the group
21. Provides take home" value
22. Has a full "toolbox" - knowledge of subject
23. Willing to share personal experiences
24. Able to relate subject matter to workplace
25. Gets everyone involved
26. Understands process and principles of adult learning
27. makes use of visual aids and hands on
28. Is a team player
29. Is aware of the participants level of knowledge

(Con't on page 9)

(Con't from page 8, Parking Lot...)

Problem #2

What should the long term commitment consist of?

Participants Solutions –

1. Create a (positive) cultural change as a goal (2)
2. employee training - Train everyone
3. Add to other curricula
4. Create an error data and associated processes (3)
5. HF based error investigative process(2)
6. Executive to have direct involvement as participant and guest (2)
7. Have a committed staff to provide HF training only.
8. Commitment from top management in both money and personnel (4)
9. Continue to update training
10. Time
11. Knowledge of resources
12. Goals (specific timeframes) and support
13. "Walk the Talk" Senior management to participate (3)
14. Management backed corrective process
15. Rewards for success (Crash-No cash)
16. Provide written policy re reporting errors (no fear)
17. A feedback/awareness process
18. Safety is just good business

Problem #3

What should be in a HPIM Workshop?

Participants Solutions –

1. Lots of interaction within and amongst the groups - Group exercises
2. Stress management - How to recognize and deal with it
3. Meet training objectives - Give objectives and overview
4. Dirty Dozen (2)
5. Use Transactional Analysis
6. Train individuals to recognize self worth, responsibility and accountability
7. Assertiveness skills
8. Case Studies, Case studies relevant to group (2)
9. Teamwork
10. Interaction icebreakers - Interaction
11. Lots of visual aids
12. Present info with time for practical application
13. Provide opportunities for teamwork exercises
14. Provide a workbook
15. Fun (2)
16. Give non structured interaction breaks
17. Focus on communication - Communication verbal & written
18. Evaluate the present and future
19. Provide follow up information - Provide training/reference material, Alt. sources of information
20. Give clear objectives
21. Use process of links in chain and safety nets
22. Application of HF i.e. What can we do?
23. Give benefits and value added
24. Introduction, communication, teamwork and the rest of the dirty dozen
25. COFFEE AND DONUTS - more donuts
26. Incentive and reward
27. Application of real examples
28. Use a neutral environment
29. Time commitment
30. War stories for and from all
31. Magnificent 7
32. Awareness of weakness & limitations

Problem #4

What are some of the pitfalls to watch out for?

Participants Solutions

1. Distractions (Like donuts) - cell phones, beepers
2. Insufficient preparation - Not being prepared (2)
3. Not staying on track - Straying off topics
4. Be sure cover issues and not "fluff"
5. Pacing information: not too fast or slow
6. Proper environment: not too noisy, hot, close to work where participants go to check.
7. Not to offend people: crude jokes, swearing - Not knowing your audience
8. Time restrictions - not managing time
9. Facilitator computability
10. Don't focus only on training: build complete program
11. One size does not fit all
12. Have realistic expectations and manage them

(Con't on Page 10)

(Con't from page 9, Parking Lot...)

13. Failure to use data
14. Selection and preparation of facilitator
15. Work to cooperate with regulators
16. Find a management champion
17. Not being flexible with objective/ contents
18. Being too flexible with time
19. Try to be subject matter expert
20. NOT ENOUGH DONUTS
21. Body language
22. Not dealing with disruptive attitudes - negative attitudes: students or instructor, loss of control
23. Not enough breaks
24. Subject turns into a "Crab' session
25. Facilitator must control group mix
26. Watch acronyms and language
27. Too many war stories
28. Preaching - Excluding participants - not enough participation
29. Giving answers instead of asking for them.
30. More action and less talk

Problem #5

What are some of the methods of maintaining the awareness which the training will provide?

Participants Solutions –

1. Post the Dirty Dozen posters - changed monthly - Various locations (5)
2. Provide safety newsletters or articles - Focus on incident findings (3)
3. Personal contact
4. A reporting system with follow-up
5. A non-punitive culture
6. Recurrent training (4)
7. Magnificent 7 posters
8. Jungle telegraph: talk about it
9. Set the example
10. DONUT INCENTIVES
11. Reinforce the written safety policy
12. Management buy in to promote the training
13. Prompts like toolbox decals, wallet cards and fridge magnets, pens, cups
14. An Award system - some type of benefit/reward system
15. Contest for safety poster design
16. Computer banners i.e. a safety message whenever the computer is used
17. Apply HF concepts in other training (2)
18. Have designated advocates (all participants should be advocates GD)
19. Websites, company TV
20. Monitor and show performance trends
21. Keep/renew champions and regulators
22. Add positive safety recognition next to dirty dozen posters
23. Be sure management backs up training by everyday activities

Problem #6

What are some sources of Human Factors information?

Participants Solutions –

1. MARSS website (marss.org) and their "GroundEffects" newsletter (2)
2. Books like "The Art of Conscious Living" by Nathaniel Brandon, "Emotional Intelligence" by
3. Daniel Goleman
4. Dale Carnigie's Public Speaking Program
5. Aircraft Maintenance Technician magazine
6. Industry newsletters - magazines
7. Internal correspondence
8. Proactive Employee programs, Employee contributes
9. Other HF Facilitators
10. Cartoons, comics
11. Crew meetings and word of mouth
12. Adaptations from other industries, nuclear etc.
13. Gov't publications, TC, FAA, CAA etc.
14. Websites like hfskyway.com. Amazon.com , ntsb.gov , ata.com (has Spec 113 re HF)
15. Contact companies who have instituted a HF program - share info - include non aviation
16. NTSB for case studies

CDROMs put out by the FAA

Problem #7

***What needs to be done in the future*?**

Paricipant Solutions –

1. Hopefully nothing because it will have been done
2. Start the training early i.e. high school shop classes - Abinito training
3. A system to share ideas and info - share data
4. More self disclosure
5. Get it ingrained (eliminates the need for the donut incentive)
6. A facilititor's bulletin board
7. Educate - provide training to your company vendors as well
8. Promote public awareness via media, - promote interest and support
9. Industry awareness
10. Prove cost effective
11. Change the culture
12. Regulation will make the training mandatory
13. HF component a part of management training
14. Provide $ incentives, management, labour, sales and even public
15. Set facilitator standards
16. Set up a human factors

(Con't from page 10, Parking Lot...)

facilitators Assn.
17. Set and maintain industry standards for facilitators and content
18. Develop an accreditation program for facilitators through an industry organization
19. Develop a comprehensive information sharing system, web based
20. Develop a web based reporting system
21. Develop a trade certificate for HF facilitators
22. Acknowledge those that practice HF policies
23. Promote ways to quantify HF advantages
24. Be able to advertise as a HF approved company.

If you have any suggestion for future articles – Please email me marss@marss.org

Look what a lack of communication can do!

Editor's Note

Again, WELCOME to the 13th issue of GroundEffects, The summer issue! Yes, we have finally made it to the one time of the year when daylight lasts for more than 8 hours and there is nowhere better to be than the beach, the park or better yet, a boat. So, wherever you may go, please take this addition along with you. It fits in your gym bag, your picnic basket, and even your pocket. Just because the seasons change, the need for safety in aviation does not.

This issue of GroundEffects talks about communication; the definition of communication, the need for it and the lack of it in our profession. As Richard Komarniski says in his knowledgeable report on communication; Communication is possibly the most important human factor issue in aircraft maintenance. Something as simple as communication is SO important in every aspect of ones' life, not just to maintenance mechanics. When you think about it, how many marriages end because the husband and wife simply lack the right tools to communicate properly? How many times have we said something in anger that we really did not mean? We are constantly communicating every day. Communication is not just about speaking, it is about body language, tone of voice and lastly, verbal. I was walking down a trail in a park with my fiancé one day and I remember seeing a teenager sitting on the park bench with a big frown on her face. Instantly, I knew she was not very happy. Look around you, at home, at work or at play and try to recognize all the communication that is going on around you... Lastly, I ask all of you to put communication high on your list of priorities because it is so important.

Also, in this issue please take the time to read the two articles on Human Factors Training for Facilitators as written by Bill Foyle and Gordon Dupont. I found it of great interest to see how the people that teach Human Performance in Maintenance think and react to certain circumstances.

Read about the success of the M.A.R.S.S. Annual General Meeting and that of C.A.S.S. '99.

I would like to thank all the past and present Board Members for their constant and continuous support. Without them and the members, M.A.R.S.S. would still be only a dream. I would also like to thank Chris Matthiesen of ECCO Heating Products for his excellent proofing skills. THANK YOU!

Have a great summer!

Renée Dupont
Editor

GroundEffects

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Forwarding and Address Correction Requested

THE HUMAN ELEMENT IN AVIATION

Our Programmes are designed to create a strong foundation for good communications by increasing trust and cooperation within the management group, within the flight operations team, within the maintenance team and between them all. They are ADAPTED TO YOUR NEEDS - scheduling, location, budget - and take into account your specific objectives and the particular circumstances prevailing in your group

TEAM EFFECTIVENESS IN THE MAINTENANCE DEPARTMENT: This programme helps create a solid psychological base for safety measures within the maintenance department, and **enhances safety, performance, and well-being.** It provides team members with practical concepts to explain personality and interaction, and their impact on the workplace: on safety, on the quality of communications, on the appropriate use of authority, and on stress. The programme **increases mutual support, open and comfortable communication,** willingness to give and to receive both appreciation and construction criticism among peers and across levels. Current relationship problems are addressed, as are **ways to improving operational effectiveness.**

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