

GroundEffects

Reporting Maintenance and Groundcrew Error Reduction Efforts

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Editors Note: The following is an article about Dehydration. A subject most of us really do not know a lot about. Some of the facts in this article will surprise you!



Dehydration – A Hidden Source of Fatigue

A couple of issues ago we talked about fatigue and how it was a problem that the industry vastly underestimated and that we vastly overestimated our ability to cope with. Well now it appears that we have a further problem that both the industry and we are basically totally ignorant of. Dehydration has the ability to induce fatigue and the resulting reduction in judgment – all without us even being aware of it.

Lets Start With a Few Interesting Facts.

1. Without water we can live about 3 days.
2. Our body is made up of about 60% water (women a little less then men for some reason).
3. Our brain is made up of 85% water and requires a very narrow range of water content to remain at its peak.
4. We lose about 8 to 10 cups, or just over 2 liters of water per normal day through breathing, urine, perspiration and bowel movements.
5. If working outside on a hot day we can lose about two pounds or one liter of water per hour.

“75% of people are dehydrated”.

- Gordon Dupont

“Space: The Lost Frontier”

by Larry O'Brian

Ramp equipment staging space is truly the lost frontier. Why is it that as airports are expanded or are newly built there is less and less gate space for arrival offload equipment. Certainly concrete is expensive but so are repairs to aircraft, facilities and equipment. This is extremely frustrating when we know confined operating space is a major contributing factor in ramp incidents.

I think we need to start asking the question: Why isn't there a standard that dictates to airports around the globe that for each gate X amount of USEABLE space has to be available for arrival offload staging?

Is it too much to ask that the largest aircraft capable for the gate has a factored standard amount of space that would be required for a normal offload of that particular

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GroundEffects would like to extend our thanks to the following companies for their generous contributions.



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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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Some Lesser Known Facts

1. Doctors now say that a whopping 75% of people don't have enough water. i.e. they're dehydrated.
2. As little as 2% loss in water content begins to cause the brain to lose alertness and the body to feel fatigued.
3. Two to five percent dehydration is considered mild but sufficient to influence how the body will react.
4. Six to ten percent is considered moderate dehydration and is cause for immediate concern.
5. Eleven to fifteen percent is severe. Hospitalization and intravenous will likely be required.
6. Beyond fifteen percent can end in death.

What Are the Symptoms?

Surprisingly, thirst is not at the top of the list of symptoms. We depend on feeling thirsty to keep us from becoming dehydrated and it has been shown to be a poor indicator.

Dr. Batmanghelidj, in his book "*Your Bodies Many Cries for Water*", states that in over one-third of us, (37%) the thirst mechanism is so weak that it's often mistaken for hunger. It is often only when we are moderately dehydrated, (6 to 10%) that we begin to pay attention to our thirst. By that time our mental alertness has dropped dramatically and we are not even aware of it.

Here are some of the most common symptoms or indicators of dehydration.

1. Lips and later mouth feel dry
2. Heart rate and breathing increases
3. Blood pressure begins to drop
4. Begin to feel fatigued
5. A nagging headache may develop and become progressively worse

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6. Decreased urine output
7. Begin to feel thirsty
8. Begin to become mentally irritated and depressed
9. Eyes begin to become sunken
10. Skin begins to become wrinkled
11. May develop a stomach ache
12. May begin to experience lower back pain
13. Become dizzy,
14. Become mentally confused
15. As dehydration becomes severe the person slips into a coma and if the cardiovascular system collapses, the person dies.

These symptoms do not necessarily progress in that exact order and may vary between persons.

As little as 2% drop in body water can begin to affect your mental alertness as the brain begins to react to the fluid loss. Dr. Kleiner, author of *"Power Eating"* states this 2% triggers fuzzy short term memory, particularly trouble with basic math and focusing on the problems on the printed page or computer screen. The problem is we are becoming dehydrated and we may not even feel thirsty yet. We will begin to feel fatigued as our metabolism begins to slow down.

Putting 2% into perspective: A 150 lb. person would need to lose only 1.8lbs of water to be 2% dehydrated. On a hot day you can lose that in less than an hour.

If, as they say, 75% of us are chronically dehydrated then we may be looking at a major contributing factor to maintenance error. And we don't even know it.

Dr. R. Eichner of the University of Oklahoma states that: "The number one trigger of day time fatigue and poor performance is not lack of sleep or stress but dehydration.

In the Arctic, or any cold climate, dehydration is a seldom thought of as a problem. Because it is cold we often don't even think of drinking but in the cold the humidity is very low and we still lose water through breathing and other body functions. The unknown dehydration leads to a feeling of fatigue and decreased mental alertness with never a thought that a simple glass of water could make the person feel better.

So What Do We Do?

Unlike fatigue, the solution is simple, very simple, drink lots of water. The old eight, eight oz. glasses of water per day isn't very accurate. It doesn't take into account, body weight, climate or activity.

The Formula

A more accurate figure calls for taking your body weight in pounds and dividing it in half. That number is the oz. of water that you require daily. To that, add 12 to 16 oz. for hot dry weather and a further 12 to 16 oz. if you are doing strenuous physical work.

That is considered a minimum to be sure that you are not dehydrated. Drinking more than that will do no harm as the kidneys maintain the correct water content and will simply "expel" the excess. This excess is thought to reduce the chances of colon cancer by 45% and bladder cancer by 50%. It is thought to help flush out the toxins or at least dilute them. Thus we would be wise to always drink more than the minimum.

If you are perspiring heavily, then you will want to also replenish some essential body salts that are being lost. These are sodium, potassium, calcium, bicarbonate and phosphate. Salt tablets will help as will some vitamin tablets.

"GatorAide" has made a fortune as a means of replenishing these salts. If you want to make your own "GatorAide" here is a recipe that will work and be a lot cheaper.

Start with:

- 1 liter (or quart) of water.
- ½ ml. (1/8 tsp) of salt.
- 75 ml. (1/3 cup) of sugar
- 100 ml. (1/2 cup) of orange juice

Add an optional crystal packet of any flavor you want. If it has

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sugar already added to it, then skip adding sugar.

If you have a blender, you can even blend in a banana to help balance the potassium.

Another optional addition is 100ml. of cranberry juice. The acidic content in cranberry juice is said to help the kidneys function better.

Now if it's hot and you're working out in the heat then you will need to drink about one of those per hour just to keep balanced.

You should also be drinking fluid about every 20 minutes in the above conditions in order to keep the fluid level balanced..

Another often forgotten source of fluid as well as some of those missing salts are fresh fruits and vegetables. They are made up of up to 90% water and are, as we know, good for you.

By fluid we mean, your "GatorAide" mixture above or plain ole water, milk, juice, mineral water and flavored seltzers but NOT tea, coffee, or alcohol.

Diuretics Do Not Help Dehydration

When you are trying to replenish your body fluid level, tea, coffee and alcoholic drinks are not the answer. In fact they make the situation worse because tea, coffee and alcohol are what are called "diuretics" and cause the kidneys to release more water, resulting in greater dehydration. If you are going to drink coffee, tea or alcohol then you better add a water chaser to them just to counteract their diuretic effect.

One of the reasons a person can become "hungover" after drinking alcohol is because their bodies are dehydrated. While it certainly isn't the only reason, it at least is one that can be combated by drinking plenty of water with the alcohol.

One of the most common times for dehydration is in the morning. We have expelled fluids from our body through the night and then we start the day with a diuretic called coffee. This results in a further loss of fluids shortly after. We then begin to feel fatigued due to dehydration, so we go and have another cup of "pick me up" diuretic (coffee). It is now easy to see how we can end up in the moderate dehydration range and not realize what the problem is.

Nonscientific Dehydration Tests

Here are a couple of nonscientific tests that may assist you in figuring out if you are dehydrated.

1. Lick your lips and if they are dry and taste salty, there is a good chance you are dehydrated.
2. Look at the color of your urine. The darker it is from the normal very pale yellow color, the more likely that you are dehydrated.

Thinking that you have somehow trained yourself to go without water is like training yourself to ignore a high water temperature indication in your car. The problem is there - you are just ignoring it.

The Journal of Sports Science reported that persons were able to work out 33% longer if they drank water while working out.

Please give this article some serious thought and remember; if we are to reduce maintenance error we have to use all means possible. Here is an easy one to fix – if we just make the effort to do it. Lets at least eliminate this potential source of error. While the industry may not, at least your body will thank you for it.



This article is written by Gordon Dupont of System Safety Services. Gordon has been an accident investigator for the Transportation Safety Board of Canada and worked for Transport Canada implementing Human Factors in Aviation for the AME. He also currently sits on the Board of MARSS.

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

**There is 2.5 Billion dollars of damage caused on the ground each year.
- Larry O'Brian**

aircraft? As an example: a 747 capable gate could require for a normal offload: two pallet loaders, three large dollies, twenty small dollies, eight baggage carts, a beltloader and a few baggage tractors. When SQUARED UP, this equipment measures 56 ft by 72 ft which equals 4032 sq ft (375 sq m) of RECTANGULAR space.

equipment we lined up for the 747 offload example we used with a vacant staging area close by to give you the feel for how many square meters is in reality.

Unfortunately there is usually less space than this and it comes in triangular shapes or is found between bridge and emergency stairs and the building. Somehow we need to find a balance among Airport Marketers, Airline Budgeters and Ramp Operating Departments whereby all of our needs are met. There appears to be an imbalance from the afore mentioned groups which leads me to believe there are two main thought processes driving this lack of usable space issue:

1. Aircraft Carrier Syndrome - belief that offload equipment will appear from below ground (ala decks) after an aircraft has been safely docked.
2. Millenium Model Ground Equipment - new aged designed equipment that comes in the following shapes: triangle, oblong, octagonal etc. (these models not to be confused with original rectangular designs which have been reshaped over the years after dealing with previously poorly designed work areas).

It is a known fact that there is 2.5 billion dollars of damage caused on the ground each year. What isn't factored is the dollar amount due to a shorter life span of equipment worth thousands of dollars caused by trying to operate in poorly planned confined space. What is that dollar value?

But worst of all, we are sending a subliminal message to our front line staff that even though we advertise safety and standards/procedures as our top priority what we are really saying when we allow this to happen is that the operation is number one and do what you have to do to make it work even though it is impossible to comply with all our SOPs. This undermines a pro-active safety program causing the staff to question the credibility of what we are trying to accomplish which is accident reduction.

We need to be involved in the planning process and we need to get across to the decision makers how much minimal usable space is required. We need to strive for standards that match the usable space with the largest aircraft type for that particular gate.

Does this problem sound familiar to you??? Please contact us at MARSS and pass on your thoughts. We have on request standard measurements for ground equipment (rectangular) as well as digital pictures of the



This article is written by Larry O'Brian. Larry is the Ramp Safety Coordinator for Canadian Airlines in Vancouver. He has been active in the human factors field for many years and is a member of the MARSS board of directors. The Ground Crew safety posters are the result of Larry's hard work.



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Editors Note: Does your company have a Safety Policy? If not, it should. The following article will help you and your company create one or maybe just to update the existing one.

The Company Safety Policy

Does your company have a Safety Policy and do you know where it is and what it says? These are questions that the only correct answers are “yes.” If we are serious about safety, then it must be expressed and the best way to express it is through a Safety Policy.

A Safety Policy is part of the company culture. It serves to inform the employees and the public about where the company stands on safety. It must be much more than a piece of paper that no one looks at or knows what it says. This policy should not be a simple 8 1/2” x 11” page buried away somewhere in your maintenance control manual or the like. It must be a living document that is updated and displayed for all to see. It should be prominently displayed wherever there are employees working and even be seen by the public so they also can recognize the company’s commitment to safety.

The contents of a safety policy must be carefully thought out and be workable. For example a policy that says the equivalent of “safety first” means very little.

Management Responsibilities

It needs to document first the company’s responsibilities to safety. By that I mean the company commits itself to provide a safe place to work. It will commit

A Safety Policy is part of the company culture.

to providing the necessary equipment to do the work safely and it will commit to providing the training to work safely. They may commit to measuring success by accident prevention and not on time performance. They may commit to provide an avenue to improve safety practices and reduce hazards that have a high potential for catastrophe or probability to cause an accident. They can commit to provide feedback to it’s employees and it can commit to providing a fair and just system when errors are reported. All these things may be in place in your company now but the safety policy formalizes then helps ensure that all employees are aware of them. But what are the responsibilities of the employee?

Employee Responsibilities

The employee also has responsibilities and these have to be spelled out. They have to see and understand that safety is EVERYONE’S responsibility. They have to agree to do their work with safety being the primary consideration. They have to agree to observe the rules in place to

ensure safe operation. They have to agree to speak up if they observe any part of the operation that is not safe.

The safety policy is one of the most important policies a company can have. It must be signed by the head of the company and I’ve seen where other top directors have also signed it. This helps indicate that the company is serious about the policy.

If the policy is followed by the company and its employees it will serve to reduce errors and as a bonus it can also reduce injuries as well. It is a win – win with very little expenditure.



“Well no, I’m not in the top half, but without people like me there wouldn’t be a top half.”

Is Human Factors Training for Aircraft Maintenance Personnel to be a One Shot Deal?

Hurray! The world is finally turning to human factors training for maintenance personnel as the next logical step in the quest to reduce aviation accidents. ICAO's amendment to Annex 6 calls for all contracting states (almost any country in the world that has aircraft registered to it) to provide this training to all the maintenance personnel that work for an approved maintenance organization. This requirement is now in effect and the world's contracting states are in the process of determining just what this human factors thing is and how they are going to meet the requirement.

JAR 66 Module 9 is an attempt to assist companies in determining what it is they should be doing. It gives 1¼ pages of topics to cover and the level it should be taught to. The levels call for remembering the material but not applying what was learned. Then again how do you apply "Murphy's" law?

For human factors training to provide it's maximum value it must have three goals.

- 1) **It must provide the participants with some tools they can use to avoid making human errors.** To say: "communication consists of a transmitter and receptor" means nothing when working on an aircraft but to train the person in the value of always paraphrasing can be very useful as a tool to reduce communication errors.
- 2) **It must have some form of follow up to maintain the awareness.** By that we mean, posters, newsletters and any means possible to assist the person in maintaining his/her awareness.
- 3) **The training must be ongoing.** This is a very important step that many companies embarking on this training do not appear to be contemplating. Even governments suggest that analysis of the human errors made within the company will suffice as human factors ongoing training. This can be valuable training if it is done correctly but it is not enough.

Human Factors training must be an ongoing project. It should be planned from the beginning to be ongoing and the material developed with that in mind.

It appears that many are planning a one shot deal and have no firm idea what to do after. One of the many problems with the "one shot deal" is that there is too much material to successfully cram into a one-session

workshop. The result is a skimming of the material and a group of frustrated participants who may fail to see the full value in the training material. With human factors training, it takes time for participants to:

- a) Assimilate the material,
- b) Recognize how it can assist them in their work,
- c) Allow them to develop their own "safety nets" to avoid making the error and finally
- d) Make the determination they are going to make the effort to begin applying the concepts to their work.

When it comes to pilot training, companies recognize and plan for ongoing training in Crew Resource Management (CRM). It is expected and accepted that the training be an integral part of the pilot's proficiency training. Often the human factors portion is exactly the same each year and some pilot's have come to refer to it as "charm school". If the pilots are referring to it as that than you can be sure that it is not achieving the objectives the training was set up to do. Human factors training must be seen as more than "charm school". Anytime any of the participants use derogatory terms like that to describe the CRM training, you can be sure they have not recognized the value of the training and have been unable to relate the training to the real life cockpit environment.

We must not make the same mistakes with our maintenance personnel. Our human factors maintenance

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training must focus on solutions to maintenance errors and not a lot of “nice to know” but now what do I do with the information?

Good human factors training will

- a) Provide the participants with simple reasons why they should be there. (Motivate).
- b) Introduce them to how they come to make unintentional errors. (Awareness)
- c) Provide them with useful tools they can use to avoid making the errors. (Safety nets)
- d) Provide case studies to reinforce what they have learned and recognize how they can be apply it. (Problem based learning)

Once all of the above have been accomplished it than becomes imperative that the motivation, awareness, use of safety nets and problem based learning be maintained. This was the primary purpose of the “Dirty Dozen” safety posters. But more, much more is required. There has to be ongoing recurrent training just as there is in CRM. This training must both be recurrent and build on the previous training.

“I have experienced more than one participant who has taken HPIM Part 1 three times. I have jokingly asked if I am a poor trainer or are they a slow learner? The reply has always been *“I learn something new each time I take this course.”* Since the course has changed very little since its initial development in 1993, this serves to reinforce the statement that if we do everything right and the participant accepts all of the content, he/she can be expected to retain and use about 30% of what was presented. Thus by taking the same course three times over three years, the retention percentage will theoretically rise to 90%.”

One way I attempt to raise the 30% is by making the workbook simple, interesting and with cartoons that encourage the participant to revisit the material. All those I have talked to after the workshop, indicated that they had revisited the workbook at least once.

So what are some *does* and *don't* in providing your workforce with some weapons to avoid making the error they don't intend to make? Whether you are providing the training in order to comply with JAR 66, some other regulation or because you see the value in it, you still want to get the most bang for the buck.

Do

- 1) Provide human factors training that is both useful and interesting.
- 2) Intricate this training into a safety management system that includes human factors investigations into incidents.

- 3) Begin the training with the company management first.
- 4) Plan on making the training an ongoing requirement.
- 5) Plan to use case studies to help maintain the awareness
- 6) Always leave them wanting more

Don't

- 1) Look at the training as a necessary evil of little value.
- 2) Try to cram in all the information into one workshop
- 3) Fill the workshop with a lot of “nice to know” material if it can't be applied to the workplace.
- 4) Fail to provide the maximum follow-up possible.
- 5) Use company case studies before everyone is trained to recognize why errors occur and proper HF analysis's of the occurrences have been carried out.
- 6) Train only the personnel on the hangar floor. Include everyone.

If we do it right the first time we will have a motivated work force that will look forward to further training. We will also reduce maintenance errors, save money and lower the accident rate. **All we have to do is do it right the first time.**

This article is written by Gordon Dupont of System Safety Services.

Conducting a Human Factors Workshop that Works

Cosponsored by System Safety Services and ACS Aviation College
Vasteras, Sweden
September 19, 20 & 21, 2000

What is it?

This workshop will introduce participants to the two day “Human Performance in Maintenance (HPIM) Part 1” workshop which has been adopted by many major airlines in Canada and the United States. This will be done with the participants taking part in an actual workshop as well as being trained to understand why the material is being taught. Along with the HPIM workbook, each participant will be provided with the Facilitator’s Notes which give the training goals and points to be covered in order to reach these goals.

Who should attend?

Anyone who is interested in the field of Human Factors training.

Where will it be held?

CS Aviation College of Sweden
Hasslogatan 2
Vasteras, Sweden S72131

Vasteras is about an hours drive from Stockholm and can be reached by a direct flight from Copenhagen.

When is it?

The date set is Tuesday to Thursday, Sept. 19 to 21, 0800 to 1600

Where can I stay?

The college will be pleased to recommend available accommodation.

What is the cost?

The cost to attend is \$550.00 US funds, and will include all training material, coffee breaks, lunch and a wine and cheese reception.

Where do I get more information?

Contact Mr. Goran Lundin or Dag Hermansson

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Goran.lundin@mail.vasteras.se

Or Gordon Dupont Phone/Fax (604) 526-3993 Email:
dupontg@home.com

To register please contact the persons above.

SMi holding it’s second annual Aircraft Maintenance Human Factors Conference

Following on the success of their first Aircraft Maintenance Human Factors event, the SMi Commercial Aviation Division is once again bringing together an impressive group of industry specialists to assist attendees with obtaining the latest ideas on how to reduce maintenance error. With news of the Concord crash fresh in our minds, this topic may never have more importance. The location is in the Hatton in London and the dates are, September 25, 26 and 27. There is an impressive line of industry experts assembled from around the world as speakers for the two-day conference held on the Monday and Tuesday. The third day offers the option of two workshops; Workshop one is an all day workshop covering the topic of “*Aircraft Maintenance Human Factors Training – Topics and Activities for Success*” in association with System Safety Services while the second workshop is ½ day and covers the topic of “*Aircraft Maintenance – Safety in the Engineering Environment*” in association with British Midlands.

This event will assist anyone to learn what they can do to reduce maintenance error.

For more information contact their website at

www.smiconferences.co.uk

We hope you are able to attend.

The New Board of Directors for MARSS



Back from left to right – **Bob Rorison**, BCIT & President. **Spence Mikituk**, Canadian Airlines. **Andy Schellekens**, S.I.L. Industries Ltd & Treasurer. **John Braund**, Executive Secretary. **Paul Jenkins**, Department of National Defense.

Front from left to right – **Larry O’Brien**, Canadian Airlines. **Bill Foyle**, retired. **Johnny Rush**, Northwest Aviation Training. **Gordon Dupont**, System Safety Services. Absent – **Richard Wisniewski**, Air Canada



MARSS and System Safety Services to certify Human Factors Facilitators

As a result of a recommendation made by a group of trainees at a human factors facilitators workshop, MARSS has teamed up with System Safety Services to provide numbered certificates to persons providing human factors training who meet the following basic requirements.

1. The facilitator must have attended a Human Performance in Maintenance workshop.
2. The facilitator must have observed a Human Performance in Maintenance workshop.

3. The facilitator must have received training in Transactional Analysis.
4. The facilitator must have conducted at least one successful Human Performance in Maintenance workshop.
5. The facilitator must be evaluated and recommended by a qualified facilitator.
6. The facilitator or his/her company must be an active member of MARSS.
7. The facilitator must sign a letter indicating that he/she believes that Human Factors training will reduce maintenance errors, will endeavour to provide the best possible training and keep abreast with the latest happenings in the human factors field.
8. Upon acceptance of the application by the MARSS board of directors, the recipient will be issued with a numbered certificate indicating he/he is considered qualified to provide Human Performance in Maintenance training.

GroundEffects is dedicated to assisting in keeping its readers up to date on what is happening around the world in this exciting new era. As a member of MARSS the facilitator will receive GroundEffects and be informed.

If you believe that you qualify to receive this training certificate, please contact MARSS to receive an application.

The Ground Crew “Dirty Dozen” have arrived

They say that an elephant has a 27-month gestation period and if so the Ground Crew Dirty Dozen have taken at least that long. But the results are great. Each one illustrates one of the dirty dozen in a ground crew environment. It, like the maintenance ones, provides “Safety Nets” to assist the reader in avoiding the error illustrated. As a bonus it also illustrates via a small photo, what the results can look like when an error like that illustrated has been made. It then gives the dollar costs under the photo. In one you see only a body covered over and you are left to decide the dollar cost on that, as it just says priceless. These are excellent quality posters and as always, show the logos of all the companies who contributed to making the series possible. Proceeds from the sale of the posters will be used to pay for further reprints and to develop further series that will be of use to our industry. To all those who’s logo appears at the bottom of the posters, we thank you sincerely. You should have received a complimentary copy by now.

The cost for a set (12 of course) of these posters is \$35.00 for members and \$70.00 for non-members. This includes handling but shipping will be on top of that. To purchase a set of these posters, contact MARSS. They will be glad to assist.



FROM THE EDITOR!

The feature article appears most appropriate for the summer issue of GroundEffects. As I write this there is a glass of water by my side instead of my normal favorite coffee drink. I suspect that I was one of the 75% who were going through life dehydrated. You just don’t think about these things but after reading that article I sure am going to start

to be more conscious of the amount of water I drink versus the amount of water I should be drinking. After all, being a natural blonde, I need all the help I can get to avoid “fussy brain” – That was a joke guys.

Larry O’Brien has come up with an excellent article in the human factors area of ergonomics. If we keep squeezing more and more into less and less space, sooner or later there will be an accident. I hope you will take a moment and provide Larry with some of your thoughts on this important matter.

I sincerely hope that human factors’ training is not going to be a one shot deal as the article by Gordon Dupont suggests. I have taken Human Performance in Maintenance Part 1 three times, (and its not because I’m blonde) and have learned something new each time. We all need the constant reminder of why and how we make errors. We just can’t hear it enough.

I look at the Safety Policy article and think it’s like that old saying “putting your money where your mouth is”. If a company says the safety is #1 than put it in writing and let the world see that you are serious.

I am real happy to announce that the ground crew posters are finally available. This is most appropriate with Larry’s article on Ramp Space. Larry was one of the persons who spearheaded these posters and rumor has it, that it’s his legs sticking out of an engine inlet on one of the posters.

Finally there are two workshops being held in Europe in September. I hope they are both very successful and serve to increase the awareness of the need for human factors training. I hope one day they provide this type of training in high school. I know I sure could of used it then.

Finally we have a photo of the Maintenance and Ramp Safety’s year 2000 Board of Directors. I guess you could call them “The Men From MARSS” but they all work hard at directing the society in its work to reduce maintenance error. If you get a chance, take a second to thank them, as it is all volunteer work with little thanks for it.

Have a great summer, don’t forget to drink lots of water and we’ll be talking to you in the fall when we hope to have the latest on what Canada and the middle east are doing in the human factors field.

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