



Aerospace Human Factors Association
A Constituent Organization of the Aerospace Medical Association

NEWSLETTER

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**Nominations for AsHFA
Officers are due November
1, 2007.**

See Page 8 for qualifications.

AsMA Scientific Meeting Calendar

Boston, MA	May 11-15, 2008
Los Angeles, CA	May 3-7, 2009
Phoenix, AZ	May 8-13, 2010
Anchorage, AK	May 8-12, 2011

Letter from the President



It is a privilege to be writing this editorial as the President of the Aerospace Human Factors Association. I am honored to have been elected to this position.

During my professional life,

I have had the opportunity to work in a variety of domains for various organizations, but I have been and shall always be most happy tackling the human-system interface challenges. One of my mentors in AsMA is Dr. Frank Austin. Frank is also one of the Charter Members for AsHFA who, along with Hank Taylor and others, helped to form this unique and highly diverse organization. Not only did I learn from Frank about persistence in reaching for one's goals, but we ended up working together in Virginia in the Space Station Freedom Program Office. That effort evolved into the operational International Space Station we have today. Frank and I experienced numerous human factors challenges and some successes. There are always more challenges than successes – if not so, life would be boring.

I have been keenly aware of human factors issues in the medical settings since I met Sue Bogner (*Human Errors in Medicine, 1994*) several years ago when I was in the Potomac Chapter of HFES. At that time I was able to view video tapes of anesthesiologists at work in an emergency room. A subsequent redesign of the “mode” interfaces on monitoring equipment and a straightforward link analysis greatly

AsFHA Officers

<p style="text-align: center;">President Ron Hoffman, PhD MEI 2525 Bay Area Blvd Houston, TX 77058</p>	<p style="text-align: center;">President-Elect Larry Bailey, PhD Civil Aerospace Medical Institute FAA/CAMI, AAM-520 P.O. Box 25082 Oklahoma City, OK 73125.</p>	<p style="text-align: center;">Past- President James R. De Voll, MD, MPH Supervisory Medical Officer Medical Specialties Division FAA HQ/AAM-200 800 Independence Ave., SW Washington, DC 20591</p>	<p style="text-align: center;">Secretary/Treasurer Carol Manning, Ph.D. Civil Aerospace Medical Institute FAA/CAMI, AAM-520 P.O. Box 25082 Oklahoma City, OK 73125</p>
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Letter from the President

improved the efficiency of the medical team. I think the ASHFA has a special role to play in improving human factors in the medical community.

Recently, I had an experience that made the need for improvement in this area very personal.

Earlier this year I was diagnosed with prostate cancer and was lucky enough to be living in Houston where the MD Anderson Proton Therapy Center opened in the spring of 2006. There are only about a half dozen of these facilities in the country.

Proton therapy consists of using highly energetic protons (about an order of magnitude higher than the more traditional X-ray treatments) to target and destroy carcinogenic tissue. Since the proton beam can be more precisely focused, there is minimal collateral damage from radiation to surrounding tissues and the probability of side effects impacting one's quality of life are minimized.

At MD Anderson, my treatment protocol involved 42 radiation sessions over eight and half weeks (Did these people read *Hitchhiker's Guide to the Galaxy*?). This was preceded with a simulation session to develop a sophisticated model for targeting that resulted in a precise positioning of my body on a slab every time with a 2 mm tolerance!

In theory each treatment should take about 20 minutes with 10 to 13 seconds of the "beam," first on your left side and then on your right side. But in

practice most sessions were closer to 40 minutes, and there were times when I had to spend an hour on the table. During these sessions I had to remain essentially **motionless**, staring at a drab ceiling and some stationary equipment components. All the while, I had a full bladder and a water-inflated balloon in my rectum to keep my prostate in the proper orientation for the proton beam.

MD Anderson Cancer Center is the most patient-oriented (substitute "user-oriented") medical facility that I have ever been in or visited. However there is a human factors challenge at the Proton Therapy Center.

As I mentioned earlier, the treatment sessions vary in length for a variety of reasons, including sensors fail, sensors stick, variations in cyclotron energy, etc. This is high tech and there are finicky moments!

The first picture is the entrance to one of the treatment rooms, known as "Gantry 4".



As shown in the next picture, outside of each treatment room, there is a sign to show everyone else the status or progress along the treatment protocol. There is another version of this sign on the wall to the left where I have placed a white circle in the first picture.



In the third picture to the right of the first one, the patient is placed on a table that is rotated to a position in front of the beam channel (black rectangle in the center of the picture).



With this setup, the patient can only see the status signage by cranking his head to one side when positioned for the second beam (and potentially violating the 2mm threat). I queried a number of patients. Nearly everyone is very anxious about what is going on while waiting and trying to being motionless in an uncomfortable position (When you “graduate,” you can join the Royal Order of the Balloon, started by a patient from the first proton therapy center in Loma Linda, CA). The only readily apparent clue you have about progress are the sounds of the therapists returning (no radiation danger now) to change your focusing blocks (from left to right) or to tell you it’s over. Fortunately there is music. The therapists supply CDs for a boom box (belongs to one of the therapists) in the treatment room. So there is not complete sensory deprivation.

I tried to explain to two of the attending physicians how one could reduce patient anxiety by putting colored LEDs in the ceiling above the table to indicate treatment progress and lower patient anxiety and provide a “focus,” but an indifferent acknowledgement seemed to be the response. One admonished me that I was not to move at all. When I said many patients were turning their heads to get some information from the distant wall-mounted sign, the response was, “...well it’s your body! Don’t move!”

Subsequently, I filled out a patient survey form, elaborated on the same points about the LEDs, and provided my name, phone number, and an indication I might have a wee bit of human factors experience, and that I could help them. No response at this date. Another challenge that I must keep pursuing.

As your President, I encourage everyone to get to promote our organization as much as possible. Also, when we update our members’ directory, I would like each of you to consider adding a sentence or two that sums up your skills and interests so we can get a better understanding of each other and our resources.

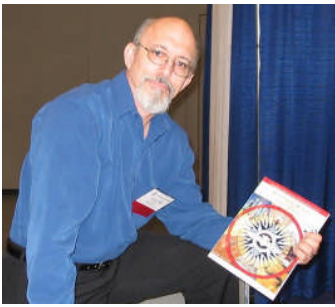
Further, I am in the progress of trying to make our operations more effective and efficient by making better use of the AsMA website. At the mid-year meeting I will be proposing using the Constituent page assigned to AsHFA for listing our new directory, for enabling mass mailings by AsHFA members to all other members, and for online voting for AsHFA.

Again, I am honored to be your President, and will try serve in way that enhances our organization and promotes us in the medical community at large.

Let me know of your challenges and successes, and challenges you are still pursuing. Often one has to be evangelistic about this business in order to make any headway - Ron

ronald.b.hoffman@comcast.net

Letter from the Editor



Recently I took up scuba diving and have encountered so many human factors mishaps that it is a wonder that I am still alive. I suppose much has to do with the fact that

my 22 year old daughter, Stacey, is my diving buddy and is there looking out for me. What follows is an account of one of my many near misses.

Shortly after receiving my diving certificate Stacey and I went to a nearby diving lake to practice our buoyancy control. We had previously practiced buoyancy control by inflating and venting air from our buoyancy compensator (BC) vest. The BC functions as an air bladder, which a diver can adjust to create positive, negative or neutral buoyancy. To become more positively buoyant the diver presses a button on the BC hose and air passes through a hose from the scuba tank to the BC. Similarly, to become more negatively buoyant the diver presses another button on the hose and air is vented. To prevent confusion and hose entanglement, the BC hose is located on the left side of the diver and the breathing regulator is located on the right side of the diver.

If the BC hose becomes blocked, it is still possible to inflate the BC by exhaling into the mouthpiece attached to the BC hose while depressing the venting button. This process is similar to blowing up a balloon. Each time the venting button is released, the air is trapped inside the BC. As an added safety measure the BC hose and mouthpiece can be used as a substitute for the breathing regulator. In the event that another diver is out of air, the diver with air replaces the regulator mouth piece with the BC mouth piece and hands the regulator mouth piece to the other diver. Both divers can now breathe from the same air supply without a need for an octopus (i.e., an additional second stage regulator that is primarily used for buddy breathing).

One of the problems that newly certified divers have is determining how much air to add and to vent to control the rate of descent and ascent. The problem occurs because there is a delay between the actions of the diver and the resulting buoyancy effects. Moreover, if the diver wishes to be neutrally buoyant, he/she must fine tune the effects of the BC with breath control. For example if the diver is slightly negatively buoyant, deeper inhales will inflate the diver's lungs sufficiently to stop the descent. Similarly if the diver is slightly negatively buoyant then deeper exhales will deflate the lungs sufficiently to stop the accent.

I got the idea that I might be able to fine tune my buoyancy by becoming slightly negatively buoyant and exhaling air into the BC. This line of thinking was based on the rationale that it was difficult for me to know how much air entered the BC when I depressed the BC inflate button. Using my breath, I should be able to breathe into the BC just enough to achieve neutral buoyancy. I didn't tell Stacey what I was thinking and instead said that we would dive to 15 feet and give her some time to equalize her ears before we explored the bottom.

After Stacy started her descent, I placed the BC mouthpiece in my mouth and descended to 15 feet. As expected Stacey had problems equalizing her ears and so she was descending more slowly than I. I took advantage of the time to practice the concept I had been thinking about and reached for the BC hose. Forgetting that I had placed the BC in my mouth rather than the regulator mouth piece, I became confused when I could not readily locate it. Eventually I found the mouth piece and prepared to transfer it to my mouth. During the transfer something didn't feel right. The hose was shorter than expected and once in my mouth I found the form unsettling. As I inhaled I noticed that the pressure was different and found that water had entered my mouth. It was then that I realized that the mouth piece was attached to my snorkel, which is also located on the divers left side. Fortunately, I had not swallowed any water and was able to find my regulator and place it in my mouth. Breathing was restored.

Perhaps it was because I was floating in water space, but one of my first thoughts afterwards was “so this is why NASA doesn’t like to conduct unplanned space walks.” Not being a human factors expert in the manned space program, I no doubt have a rather naïve perspective of what it takes to conduct a space walk. However, I imagine that there is an increased risk for human error associated with performing activities that have not been previously tested and practiced on several occasions. Moreover, without a checklist to ensure that important task elements are performed in the proper order, I can see how past learned behaviors may interfere with the performance of new behaviors (i.e., proactive interference).

In my case, I had 5 hours of underwater practice with breathing through my regulator. On the surface before my storied dive, I practiced breathing through my BC for less than a minute. Once submerged my thoughts shifted to addressing the immediate demands of my underwater environment (i.e., breathing, equalizing my ears, and searching for a practice spot). Being strong, the neural pathways associated with these activities inhibited the functioning of the pathways associated with a new concept (i.e., breathing through the BC).

When Stacey and I returned to the surface, I felt compelled to share with her the new insights that I had gleaned from my experience. However, after sharing, Stacey’s only response was “Why did you not tell me what you were going to do?” Although Stacey did not know it, her question triggered another thought which was “Oh my gosh! I screwed-up on crew resource management as well!”

Suffice it to say that I am doing better at constructing a dive plan, sharing it, and then diving the plan. Whether underwater, in air, or in space, the concept sounds simple and yet it encompasses so much.

- Larry

If you have a human factors story that you would like to share, please contact me at
Larry.L.Bailey@FAA.Gov

AsHFA Sponsored Panels



Greetings! I hope you saw the coverage of our association’s awards (the Roscoe Award, the Taylor Award, and the Collins Award) in the August 2007 Aviation, Space, and Environmental Medicine Issue. Dr. Bailey has included a description of

each award and a recap in the current newsletter. Please help spread the word about these awards. We will be accepting nominations for these awards starting in December

I have started soliciting panel presentations for AsHFA sponsorship for AsMA 2008. Currently we have two panel areas that are under consideration: 1) *Neurocognitive Screening Tools* and 2) *Human Factors in Medicine*.

Dr. Ron Hoffman is serving as the coordinator for the *Neurocognitive Screening* panel. He is currently soliciting presenters. If you are interested in learning more, he can be reached at ronald.b.hoffman@comcast.net

The *Human Factors in Medicine* panel is the result of a joint effort by Dr. David Schroeder and Major Julia Sundstrom. Thus far, they have confirmed interest from Dr. Jim Bagian, Dr. Linda Connell, Dr. Sarah Henrickson, Dr. Scott Shappell, and Dr. Doug Wiegmann. A description of the panel is below:

Human performance issues within medical practice contribute to misdiagnosis, decision errors, and user-interface errors. Medical errors have been found to occur regularly in all aspects of patient care ranging from medication errors to surgical procedures. Over the past decade a number of aviation human factors specialists have

been hired to provide quality assurance evaluations, operational risk assessments, and to develop mitigation strategies focused to address human error within the medical arena. These assessments have addressed the transfer of crew resource management (CRM) philosophy to medical practice, human factors evaluations of medical instrumentation, the use of procedural checklists, issues associated with alarms and alerts, review of medical errors, error reporting systems, transfer of information across shifts, and the influence of interruptions and distractions on communication and performance. Approaches aimed at preventing and correcting human error within medicine are similar to those found in other disciplines and require a multi-layer preventative approach. A data-driven approach requires the cooperation of involved personnel who can identify problems without fear of reprisal.

Thank you
Carla A. Hackworth

2007 AsHFA Award Recipients

Henry L. Taylor Founder's Award



Dr. Glenn Wilson (left), receives the Henry L. Taylor Founder's Award from Dr. Ray King (right).

Dr. Glenn Wilson, the 2006 winner of the Henry L. Taylor Founder's Award for outstanding contributions in the field of aerospace human factors, was the speaker at the Aerospace Human Factors Association's Luncheon and Business Meeting in New Orleans. Dr. Wilson's

presentation entitled: Operator Functional State (OFS) Assessment and Application, reviewed the highlights of the results of research involving psychophysiological determined OFS. He then speculated on what the future held for OFS.

Recently retired, Glenn Wilson was employed as a Principal Research Psychologist at the Air Force Research Laboratory's Human Effectiveness Directorate at Wright Patterson AFB, OH. The primary focus of his work was to find psychophysiological correlates of operator performance in complex Air Force environments. This included recording multiple physiological measures during flight in several operational test and evaluation programs as well as a "flying laboratory" using Aeroclub aircraft. Laboratory and simulator tasks were also used to develop measures of operator functional state. One of his recently realized goals was to close-the-loop by including the momentary functional state of the operator in decisions to provide adaptive aiding. Brain, eye and cardiac activity were used to determine if the operators of a UAV simulation were cognitively overloaded and about to make errors. Significant improvements in performance were found when adaptive aiding was applied only when it was needed as determined by changes in the operator's physiology. He also recorded what may be the first brain evoked potentials during aircraft flight, a task he promises never to repeat. He is a charter member and Fellow of AsHFA.

Stanley N. Roscoe Award



Dr. Alison Tollner Burngasser is the winner of the Stanley N. Roscoe Award.

The Aerospace Human Factors Association presented the 2007 Stanley N. Roscoe Award for the best doctoral dissertation written in a research area related to Aerospace Human Factors to Dr. Alison Tollner Burngasser, Ph.D. Dr. Burngasser's dissertation, "Individual and Team Susceptibility to Change Blindness," investigated the phenomenon of change blindness in teams of operators monitoring displays in a simulated air battle management environment. The dissertation was sponsored by the Air Force Research Laboratory (AFRL), Human Effectiveness Directorate, Warfighter Interface Division, Collaborative Interfaces Branch (HECP's) Collaborative Tools for Tactical Command and Control research program and is part of an ongoing collaboration between the University of Cincinnati's Department of Psychology and AFRL's Human Effectiveness Directorate. Dr. Burngasser received her BA in Psychology from Buffalo State College and both her MA and PhD in Experimental Psychology with a concentration in Human Factors from the University of Cincinnati. Dr. Burngasser is currently employed as a Sensory Scientist, studying tactile and scent perception of beauty care products, at the Procter & Gamble Company Beauty Care Research Center, in Cincinnati, OH.

William E. Collins Award



Mark R. Rosekind won the William E. Collins Award

The Aerospace Human Factors Association presented the William E. Collins Award for "Outstanding Human Factors Publication of the Year" to Mark R. Rosekind, Ph.D., President and Chief Scientist for Alertness Solutions. Dr. Rosekind and his co-authors K. Gregory and M. Mallis published their article entitled "Alertness Management in Aviation Operations: Enhancing Performance and Sleep" in *Aviation Space and Environmental Medicine* 77(12), 1256-65.

Dr. Rosekind began his scientific career while an undergraduate at Stanford University conducting research at the Stanford Sleep Disorders and Research Center. He graduated from Stanford with Honors, and then obtained his Ph.D. in clinical psychology and psychophysiology at Yale University. Dr. Rosekind completed his formal academic training with a postdoctoral fellowship in sleep and chronobiology at Brown University's Sleep Laboratory.

Dr. Rosekind's expertise has been used by many government agencies to address safety and alertness-related policies. He has contributed directly to policy activities involving the Federal Aviation Administration, Federal Rail Administration, Federal Motor Carrier Safety Administration, Nuclear Energy Commission, NASA, and numerous corporations, and has provided Congressional testimony. Over the years, Dr. Rosekind has worked extensively with the National Transportation Safety Board (NTSB), including as Co-Chair of the first symposium on fatigue in transportation organized by the NTSB and NASA. Dr. Rosekind led efforts to develop a structured approach to examining fatigue factors in accident investigations for use by NTSB investigators and teaches a course on this topic at the NTSB Academy. He is a member of the Board of Directors of the National Sleep Foundation and the Executive Council of the Harvard Medical School's Division of Sleep Medicine.

In Memoriam

It is with deep remorse that I report the passing of Alexander Samel, Ph.D. in May of this year. In 2006 Dr. Samel was



elected as an AsHA Fellow for his active service in ASMA and for his scientific contributions in Aerospace Human Factors and Physiology. Being a friend and colleague of many of our AsHFA

memberships, he will be greatly missed. You can read more about Dr. Samel's life on page 922 of the September 2007 edition of Aviation Space and Environmental Medicine.

Nomination for AsHFA Officers

Please submit your nominations, by **November 9, 2007**, for President Elect and for Member at Large, and for AsHFA's Representative to the ASMA Executive Council to Larry.L.Bailey@FAA.GOV.

Listed below are the qualifications as stated in the AsHFA ByLaws. **Please contact your nominees before submitting their names to ensure their willingness to serve if elected.**

Duties of the President. It shall be the duty of the President to preside at all meetings of the Association; to act as Chair of the Association Executive Committee; to exercise supervision over the affairs of the Association with the approval of the Executive Committee; and to perform such other duties as are incidental to the office or as may properly be required by vote of the Association Executive Committee. In the absence or incapacity of the President, the duties of President shall be assumed by the President-Elect.

1. _____

2. _____

Duties of the Member-at-Large. It shall be the duties of the Members-at-Large to serve as members of the Nominations and Elections Committee, as provided in Article V, Section 4; and serve as members of the Association Executive Committee. They may also be designated to provide assistance to the Program Committee, the Membership Committee, or the Association Representative, or be given special assignments, at the discretion of the President.

1. _____

2. _____

Duties of the AsHFA Representative to Council. It shall be the duty of the Association Representative to the ASMA Executive Council to perform the duties and accept the responsibilities specified in Article IV of the By-Laws of ASMA. Members of Council are a primary force in enabling the ASMA to achieve its mission and goals, realize its opportunities and fulfill its obligations to the fellows and members of the association. As the policy-making body for the association, members of Council have the ultimate responsibility for the management of the affairs of the association. They are expected to bring a sincere conviction that the association performs a critical function and plays an important role in advancing the field of aerospace medicine as defined in the bylaws of ASMA and are expected to always act in the best interest of the association.

1. _____

2. _____

3. _____

Once the nominees have been reviewed for their ASMA and AsHFA membership status, there names will appear on a separate voting ballot that will be distributed to the AsHFA membership in January 2008.



Application/Renewal of Membership in
Aerospace Human Factors Association

- Membership Renewal: I wish to renew my membership in the Aerospace Human Factors Association. **I am a current member of the Aerospace Medical Association.** I am enclosing \$15.00 (U.S. funds) for annual dues with this application.
- Full-time Student

Name: _____

Title: _____

Name of Highest Degree: _____ Year: _____

Preferred Address: Home Business (circle one)

Preferred Phone: () _____ Home Business (circle one)

Fax Number: () _____

E-mail address: _____

Please complete this printed form and mail it with a check for \$15 (payable to Aerospace Human Factors Association) to the Membership Chair listed below. You can also find a copy of the application form at:

<http://www.asma.org/Organization/ashfa/Pages/AsHFAMemApp2001.pdf>

Membership Committee

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