

Aerospace Human Factors Association

A Constituent Organization of the Aerospace Medical Association

NEWSLETTER

Volume 11, Issue 2

November 2003

New Newsletter Editor in Search of Content

Hi, I'm proud and happy to be serving as your new newsletter editor. I'll be even happier when I can insert more content into this newsletter. Please send items of interest to our membership, including reports of human factors-related meetings and human factors success stories to me at: Skykng321@aol.com

Ray King

**REMEMBER TO PAY
YOUR AsHFA Dues
(see page 6)**

FROM THE PRESIDENT'S DESK.....

Greetings from the University of Illinois at Urbana-Champaign. Autumn is now upon us. As I look out the window from my office at the Beckman Institute, I can see the leaves turning bright orange and red. It's a beautiful sight (yes, there are more than just cornfields in central Illinois!). We are in the midst of the college football season and are now looking forward to the start of the college basketball season, which begins next month. Perhaps we in Illinois are looking forward to basketball more than others, given our football team's 1-5 record so far this year! However, the Chicago Cubs did give us something else to think about other than a losing football record. Even though they did not make it to the World Series, the Cubs gave many of us hope that the problems of the past can be overcome.

On a more somber note, there is currently a need for hope and optimism within the aerospace industry following the tragic Columbia space shuttle disaster. Indeed, this dreadful event served to remind each of us of the risks and dangers involved in space flight. The final report of the accident also highlighted the tremendous impact that human factors often play in the safety of flight operations. The Columbia accident, which on the surface appeared to be caused solely by a catastrophic structural failure, was later determined by the investigation board to be directly linked to communication and cultural problems within NASA. Such findings are disconcerting and should challenge all of us to explore new ways of contributing to flight safety. Even within our own organizations, we should be exploring ways of improving safety policies, practices, and procedures. Who else but aerospace human factors professionals are uniquely qualified to take on this extremely important role?

Other recent events outside the realm of aviation also reveal the need and/or opportunity to apply principles of human factors to the design and evaluation of other complex system. For example, recent blackouts in both Europe and North America suggest that the electrical power industry may be in need of restructuring, opening the door for significant inputs by human factors professionals. Problems in other domains, such as healthcare and medicine, or even national security are also in need of our knowledge and expertise in human factors. Whenever possible, we should make efforts to share, disseminate, and apply the lessons we've learned in aviation to these other complex domains in which humans operate.

In closing, I would like to say that it is an honor to have been elected president of the Aerospace Human Factors Association. I look forward to working with all of you over the remainder of my term. I am optimistic that our field has a great deal to offer both within and outside the aerospace industry and I hope that together we can have a tremendous impact on the future.

Warmest Regards,

Doug Wiegmann

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UPCOMING EVENTS

December 1-4, 2003 – *International Symposium on Human Factors in Telecommunications, Berlin, Germany*
http://impcs3.hhi.de/HFT/HFT_03.htm

January 13-16, 2004 – International Conference on Intelligent User Interfaces/Computer-Aided Design of User Interfaces, Island of Madeira, Portugal <http://www.iuiconf.org/>

March 15-17, 2004 – 16th Annual European Aviation Safety Seminar, Barcelona, Spain
http://www.flightsafety.org/eass04_cfp.html

March 23-26, 2004 – 4th International Workshop on Smart Appliances and Wearable Computers, Tokyo, Japan
<http://www.unl.im.dendai.ac.jp/IWSAWC/>

April, 2004 – SAE General Aviation Technology Conference and Exhibition, Century II Convention Center, Wichita, KS
<http://www.sae.org/calendar/aeromtgs.htm>

April 24-29, 2004 – CHI 2004, Conference on Human Factors in Computing Systems, Vienna, Austria
<http://www.acm.org/sigchi/chi2004/>

April 27-29, 2004 – 49th Annual Corporate Aviation Safety Seminar, Tucson, AZ http://www.flightsafety.org/cass04_cfp.html

May 2-7, 2004 – 75th Annual Scientific Meeting of the Aerospace Medical Association, Egan Convention Center, Anchorage, AK
<http://www.asma.org/>

May 6-8, 2004 - AHS International 60th Annual Forum and Technology Display, Virginia Beach, VA. Contact Staff@vtol.org

July 27-August 2, 2004 – 52nd Annual AirVenture, Oshkosh, WI
<http://airventure.org/>

July 28 – August 1, 2004 – 112th Convention of the American Psychological Association. Honolulu, Hawaii
<http://www.apa.org/convention>

September 20-24, 2004 – Human Factors and Ergonomics Society 48th Annual Meeting, Sheraton New Orleans Hotel, New Orleans, LA <http://www.hfes.org/>

October, 2004 – 18th Airbus/JetBlue Human Factors Symposium, New York City, NY <http://www.airbus.com/customer/events.asp>

The Aerospace Human Factors Association



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Aviation Research Laboratory
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P.O. Box 25082
Oklahoma City, OK 73125

Secretary/Treasurer

Tamara L. Chelette, Ph.D.
2062 Griffon Place
Centerville, OH 45459

AsMA Scientific Meeting Calendar

Anchorage, Alaska
May 2 - 7, 2004

Kansas City, Missouri
May 9 - 12, 2005

Orlando, Florida
May 14 - 18, 2006

CALL FOR NOMINATIONS FOR ASHFA PRESIDENT-ELECT AND MEMBER- AT- LARGE.

Nominations are currently being sought for the position of AsHFA President and Member-at-Large. If you know of a colleague (or perhaps you, yourself?) who you feel would best serve our organization in its highest executive leadership positions, please consider nominating that individual today. All nominations (and any questions about the position or nomination process) should be sent directly to AsHFA President-Elect, CAPT David F. Neri via e-mail at: nerid@onr.navy.mil, or via snail mail to his address indicated above. **Deadline for nominations is 2 Feb 04. See page 22 of this newsletter.**

NEW GRADUATE PROGRAM IN HUMAN FACTORS

University of Illinois at Urbana-Champaign Institute of Aviation

The University of Illinois at Urbana-Champaign has established a new **M.S. Program in Human Factors**. This program involves a broad and diverse group of faculty and students based in academic units including the Institute of Aviation's Human Factors Division, the Departments of Psychology, Mechanical & Industrial Engineering, Computer Science, and the Human-Computer Intelligent Interaction Group at the Beckman Institute. The program focuses on a wide variety of cognitive human factors issues within both aviation and non-aviation systems. Applications will be accepted starting **November 1, 2003** for Fall, 2004 admission. Admission requirements include a minimum 1200 GRE score (V+Q), a minimum 3.0 undergraduate GPA and three letters of recommendation. Program requirements include coursework and a research thesis. Prospective applicants can obtain additional information on the program and the application process by contacting Professor Christopher D. Wickens, Head, UIUC Aviation Human Factors Division. Phone: 217-244-8617. Email: cwickens@uiuc.edu

University of Illinois at Urbana-Champaign Institute of Aviation Human Factors

Assistant/Associate Professor Position

The Institute of Aviation is seeking application for a tenure-track, faculty appointment at the Assistant or Associate Professor level in human performance, organizational behavior, or complex systems. Preference will be given to candidates whose research program includes a focus on aviation systems. The candidate must have a relevant Ph.D. and will be expected to teach graduate and undergraduate courses in general human factors as well as in aviation human factors.

The faculty appointment will be in the Institute of Aviation. The faculty member will also participate in UIUC's internationally-recognized, interdisciplinary program in human factors collaborating with the Departments of Psychology, Mechanical and Industrial Engineering, the Beckman Institute for Advanced Science and Technology, and other

The position is based on a 9-month academic year. The salary is commensurate with experience. The appointment will begin on August 16, 2004

To apply, please send a curriculum vita and three letters of reference to Professor Douglas A. Wiegman, Chair of the Search Committee, Institute of Aviation Human Factors Division, #1 Airport Rd., Savoy, IL 61874; 217/244-8637; e-mail: dwiegman@uiuc.edu. For full consideration, applications should be received by December 15, 2003.

<http://www.aviation.uiuc.edu/UnitsHFD/ar1.htm>.

The University of Illinois at Urbana-Champaign is an Affirmative Action-Equal Opportunity employer.

Announcement of AsHFA AWARDS

Stanley N. Roscoe (Dissertation) Award

AsHFA recognizes the need to foster and support our growing Graduate Student membership through a program of proactive mentorship. One critical facet of this effort is an annual formal recognition of scholarly achievement in human factors. This takes the form of AsHFA's annual presentation of the Stanley N. Roscoe Award for the best Doctoral Dissertation written in a research area related to Aerospace Human Factors. Named for the distinguished scientist and educator, the Stanley N. Roscoe award is administered through the University of Illinois Foundation. This year's award will be presented at the Aerospace Human Factors Association's annual business meeting and luncheon on May 3, 2004 in Anchorage, AK and will include a plaque and an honorarium of \$500. (You need not be present to be eligible).

Criteria for judging the doctoral thesis/dissertations include

- (a) significance of the problem and innovativeness of the approach
- (b) review of relevant research
- (c) effectiveness of the research design and analysis
- (d) interpretation of results
- (e) theoretical and practical value of the work
- (f) clarity of writing.

To be eligible for this award, the dissertation must have been completed and accepted by the sponsoring department between October 1, 2002, and September 30, 2003. To have their dissertations considered for this award, please encourage your recent graduates to submit a cover letter, three copies of their dissertation, and a letter of recommendation from their faculty advisor. All material must be postmarked **no later than February 20, 2004**, and sent to the current chair of the Awards Committee of the Aerospace Human Factors Association.

If you have any other questions concerning this or any other AsHFA award, please contact the Awards Chairman

Dr. Thomas E. Nesthus, Awards Chair
FAA, CAMI, AAM-510
P.O. Box 25082
Oklahoma City, OK 73125

The 2003 Roscoe Award Recipient was Edward S. Eveland for his Dissertation titled "Neck Muscle Response to Changes in Helmet Loading Under +Gz Acceleration-- Gender Differences" from Wright State University.

Henry L. Taylor Founder's Award

The University of Illinois Institute of Aviation has established an Aerospace Human Factors Association endowment to fund the **Henry L. Taylor Founder's Award**, for outstanding contributions in the field of aviation human factors. The Aerospace Human Factors Association will annually solicit nominations for the award. The criteria for evaluating the nominations are as follows: (1) research and publications; (2) special original contributions, e.g., equipment, techniques, and procedures; or (3) general leadership in the field, e.g., teacher, director of laboratory, officer scientific societies, etc. Recipients of the Paul T. Hansen Award will not be eligible for consideration for the Henry L. Taylor Founder's Award. The Institute of Aviation will annually provide a \$500 honorarium to the selected participant, whose name will be announced at the annual business meeting of the Aerospace Human Factors Association. The recipient of the award will present the Henry L. Taylor Founder's Lecture at the annual ASHFA business meeting in May, and will then receive the honorarium and a plaque. ASHFA members who would like further information about the award should contact the ASHFA Awards Committee Chair noted below.

Nomination Form

Henry L. Taylor Founder's Award

For Outstanding Contributions in the Field of Aerospace Human Factors

I nominate:

Present Position:

Business Address:

Please support your nomination by attaching documentation indicating outstanding contributions your nominee has made in the field of Aerospace Human Factors. Outstanding contributions in the following areas will be evaluated by the Awards committee: (1) research and publications, (2) special original contributions, e.g., equipment, techniques and procedures, or (3) general leadership in the field, e.g., teacher, director of laboratory, officer scientific societies, etc. Please provide the necessary documentation of how your candidate is outstanding with respect to one or more of these criteria. Three letters of endorsement with supporting evidence are required. Further, ensure that your nominee has not previously been a recipient of the Paul T. Hansen Award; recipients of the Hansen Award will not be eligible for consideration for the Henry L. Taylor Founder's Award. The Henry L. Taylor Founder's Award will be presented at the annual business meeting luncheon of the Aerospace Human Factors Association and will include a plaque and an honorarium of \$500.

Recipients of this award will deliver a lecture at the Annual Business meeting of the Aerospace Human Factors Association to be held in May. The presentation will address a scientific or technical topic, provide an historical review of the recipient's area of expertise, or describe personal reflections on important events in the development of the field of aerospace human factors.

Date:

Signed:

Title:

Address:

Return this form by March 1, 2004 to:

Dr. Thomas E. Nesthus, Awards Chair

FAA, Civil Aerospace Medical Institute AAM-510

P.O. Box 25082, Oklahoma City, OK 73125

The 2003 Henry L. Taylor Founder's Award Recipient and Guest Luncheon Speaker was Dr. Henry Mertens.

Dr. Henry Mertens received the 2003 Henry L. Taylor Founder's Award and served as the ASHFA guest luncheon speaker. Dr. Mertens retired in May 2002 after a 39-year career as a research psychologist at the FAA Civil Aerospace Medical Institute in Oklahoma City. He worked as head of the Behavioral Stressors Section of the Human Factors Laboratory of CAMI for the last 22 years. His research experience included applied research on aviation problems in the areas of visual space perception, visual psychophysics, psychopharmacology, and complex human performance as a function of adverse environmental, physiological, and pharmacological factors.

He received a B.A. (1960) from the University of Missouri and an M.A. (1962) from the University of Arkansas in psychology. In 1979, he received a Ph.D. in experimental psychology from the University of Oklahoma. His dissertation research evaluated known glide slope cues and an innovative technique for visual judgment of glide slope during visual approach and landing maneuvers.

The Behavioral Stressors Section studied the effects of aviation stressors on complex performance using the well known Multiple Task Performance Battery developed by Drs. Alluisi, Adams and Chiles. Stressors such as age, crash diet, smoking withdrawal, and alcohol were studied and frequently their interaction with hypoxia was evaluated. Henry also worked with others in the section to advance the MTPB technology. It is currently being used at CAMI in a PC-based version to study the effects of fatigue associated with rotating ATCS shift schedules, interaction effects with age, and the effectiveness of fatigue countermeasures. Henry also participated in a CAMI team that developed a unique reconfigurable, high fidelity general aviation research

simulator that is currently used in a wide range of research projects on General Aviation cockpit human factors.

During the last decade, his research team was mainly concerned with color vision issues in the performance of Air Traffic Control Specialists and pilots. That research supported aeromedical color vision standards, and demonstrated the validity of color vision screening tests for initial screening of both ATCSs and pilots. They also worked on the development and validation of practical color vision tests specifically for selection of ATCS applicants. Those tests are currently used for secondary color vision testing of applicants who fail initial color vision screening.

Henry is a Fellow of both the Aerospace Medical Association and the Aerospace Human Factors Association. He is a Member of the Human Factors and Ergonomics Society and an Adjunct Associate Professor in the Department of Psychiatry and Behavioral Sciences at the University of Oklahoma Health Sciences Center. Henry received the Aerospace Medical Association's Raymond F. Longacre Award in 1999. Henry has maintained an interest in color vision since retirement and has consulted with the aerospace industry on issues involved in this topic area.

Previous recipients of the Henry L. Taylor Founder's Award were:

2002	Charles E. Billings, M.D.
2001	David J. Schroeder, Ph.D.
2000	Christopher D. Wickens, Ph.D.

National Research Council Resident Research Post Doctoral Associate Program

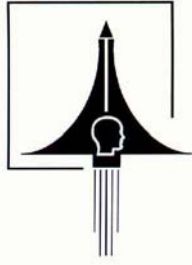
The Civil Aerospace Medical Institute, in conjunction with the National Research Council (NRC), has selected ASHFA Membership Chair, Dr. Arnie Angelici to one of two NRC Post Doctoral Associates. Their research programs are at the leading edge of human research that can be applied to civilian aerospace activities.

Civilian Space Medicine: In 2002, the Associate Administrator for Commercial Space Travel (AST) requested support from the Office of Aerospace Medicine to assist in the development of medical, cabin environment and life support equipment licensing guidelines for commercial manned space travel. In support of this effort, AST provided funding for a National Research Council (NRC), postdoctoral research position to assist CAMI in the development of minimum requirements for environmental control and life support systems on manned commercial reusable launch vehicles. The objectives for this effort are to develop guidelines that will eliminate or minimize factors that could result in an in-flight medical emergencies or a fatality, or factors that compromise the health and safety of any occupant. The focus of these guidelines is to support aerospace safety and the

implementation and growth of the manned commercial space transportation industry. Dr. Arnold Angelici was selected as the NRC research associate, and started work at CAMI in August 2003. It is expected that the final product of this research will be a comprehensive report that provides guidance and recommendations to the FAA for potential licensing that is supported by accepted research data. Dr. Angelici was an internist until July 1999, when he took a sabbatical to do a residency in aerospace medicine at Wright State University, Dayton Ohio. After completion of the two-year program and working to complete his master's thesis, he temporarily returned to primary care medicine. Actually a sub-specialty of primary care medicine that was restricted to males above the age of 18. The practice was limited to restricted community of men in two locations in Ohio. The first was in Grafton Ohio (a small town Southwest of Cleveland) and the second location was on the far East side of Youngstown, Ohio. These medical practices were at the Lorain Correctional Institution and the Ohio State Penitentiary (aka "Super Max") and the field of medicine is known as Corrections Medicine or Prison Medicine. Dr. Angelici applied for the grant after learning of it through Dr. Sahiar at Wright State University where Dr. Antunano gave a presentation on the subject of the development of minimum requirements for environmental control and life support systems on manned commercial reusable launch vehicles. His proposal was accepted and the grant awarded in July of this year. He is looking forward to a very busy and productive year at CAMI. If any members think that they might have something to offer on the subject of environmental control and life support systems on manned commercial reusable launch vehicles for sub-orbital flight, Dr. Angelici would like to hear from you. He can be contacted at 405-9543356 or arnold.CTR.angelici@faa.gov.

Plan to Attend the ASHFA Luncheon on Monday, 3 May!

Dr. Gerald Krueger will serve as the luncheon speaker.



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 the printed form then mail it with a check for \$15 (payable to Aerospace Human Factors Association) to:

Tamara L. Chelette, Ph.D.
2062 Griffon Place
Centerville, OH 45459

If you are applying for membership for the first time, please use the application form found at
<http://www.asma.org/ashfa/memapp.htm>

AsHFA THANKS

The UNIVERSITY of ILLINOIS INSTITUTE
OF AVIATION

For Sponsoring the

Henry L. Taylor Founder's Award

and the

Stanley N. Roscoe Award

Contributions to support the Henry L. Taylor Founder's Award and the Stanley N. Roscoe Award can be made to the University of Illinois Foundation, Aerospace Human Factors account at the following address:

University of Illinois Foundation
Attn: Stanley N. Roscoe Award
Harker Hall, MC-386
1305 West Green Street
Urbana, Illinois 61801

AsHFA Also THANKS

Ronald C. Hill, Ph.D.
Vice President, Human Systems Group
GENERAL DYNAMICS - Advanced Information
Engineering Services
Dayton, Ohio

For Sponsoring the

William E. Collins Award

For the

Best Aerospace Human Factors Journal Article
of 2003

AsHFA Welcomes 12 New Members!

Wilber Blount	Patricia Borrientos
Todd Frederick	Carolyn Haynes
Tomaz Kozelj	Gordon Landsman
Jim McGhee	Melissa Mallis
Nelda Milburn	Nita Miller
Tami Ngyen	Rick Shering

AsHFA Welcomes 3 New Fellows!

Ray King
Scott Shappell
Frederick Rohles

CALL FOR ASHFA FELLOW NOMINATIONS

The Aerospace Human Factors Association (AsHFA) has many members who have inspiring records of accomplishment in applying human factors knowledge and methods to enhance safety, effectiveness, and efficiency in a wide variety of aerospace activities. The AsHFA calls for you to nominate your colleagues in AsHFA that meet the requirements for Fellow described below, and whom you would like to recommend.

Fellows of the AsHFA shall be persons who:

- (a) are also members of the Aerospace Medical Association,
- (b) have been AsHFA Members for at least five years,
- (c) have contributed significant service to AsHFA,
- (d) have had five years work experience related to aerospace human factors,
- (e) have been endorsed by at least three Fellows of the AsHFA,
- (f) have been selected by the Fellows Review Committee for unusual and outstanding contributions or performance in the field of Aerospace Human Factors
- (g) have been elected by a majority vote of the Fellows of the AsHFA.

Those submitting nominations should compile the nomination form, supporting documentation, and three recommendations from Fellows and send them to the address on the forms (see the following pages). The Fellows Review Committee will be sent copies of these materials. The nominator may submit paper or electronic copies of forms. Contact the acting Fellows Chair, Doug Wiegman (dwiegman@uiuc.edu), to receive electronic copies.

NOMINATION FORM FOR 2004 AsHFA FELLOWS CANDIDATE
DEADLINE FOR RECEIPT OF NOMINATION MATERIALS IS FEBRUARY 2, 2004

1. Name of candidate _____
2. Date of birth _____
3. Present Position _____
4. Organization _____
5. Business Address _____
6. Business telephone number _____
7. Home Address _____
8. Home Telephone Number _____

9. Education:	Degree (year)	Major field
Institution		

10. Professional work history	Organization, City	Position held & Responsibilities
From start year to finish year		

11. Technical Publications with References (List three most significant reports first. Then list additional publications. Use additional Sheets if necessary.) Also, send one copy of each of the three most significant publications authored or co-authored by this candidate with nomination form.

12. Year nominee joined AsHFA _____ AsMA _____.

13. Continuous AsHFA member since _____.

14. AsHFA/AsMA society involvement. (For example, elected or appointed offices, committee service, evidence of annual meeting involvement, publication in Aviation, Space, & Environmental Medicine, paper presentations at annual meeting. Please give dates of service.)

15. Other significant human factors professional involvement, recognition, and leadership. (For example, pioneering work in education program development, service to national or international advisory boards such as ICAO, NATO, NSF, NAS-NRC, honors and awards related to our profession, exceptional service to related professional organizations.)

16. Special contributions of candidate. The most significant contribution that qualifies the candidate for Fellow is:

17. Other significant contributions are:

18. Names and addresses of three Fellows who will recommend the candidate: All must be ASHFA Members in good standing. The nominator is responsible for soliciting the three nominations. The recommendations should be prepared using the standard form "RECOMMENDATION FOR FELLOW" and submitted with this nomination form.

- a.
- b.
- c.

19. Candidate nominated by:

Name: _____

Address: _____

Telephone number: _____

If publications are considered to be a major contribution of the nominee, then one copy of each of the three most significant publications authored or co-authored by the candidate should be furnished. Other evidential information that will attest to the achievements of the candidate should be furnished to aid the Fellows Selection Committee in their deliberations. Those submitting nominations should compile the nomination form, supporting documentation, and the three Fellows recommendations and send them to the address below.

No limitation is placed on the number of times a Member may be nominated for election to Fellow status.

Please return this form to the Executive Board in care of:

Doug Wiegmann, Ph.D.
University of Illinois
Aviation Research Laboratory
Willard Airport
#1 Airport Road
Savoy, Illinois 61874
dwiegman@uiuc.edu

RECOMMENDATION FORM FOR CANDIDATE FOR FELLOW

Provide 3 references for each nomination

(Confidential)

Candidate: _____

Name of Reference (Member) _____

Your name has been given as a reference to evaluate the above candidate for the status of Fellow in the Aerospace Human Factors Association (AsHFA). For your convenience, the AsHFA criteria of eligibility for Fellow status are listed on the other side of this page.

If you feel qualified to evaluate the candidate, please check here ____.

Was a copy of the completed nomination form included for your information? Yes ___ No ___

If so, was the candidate's case adequately presented? Yes ____ No ____

Please furnish below (and on a separate sheet of paper, if necessary) any additional data that you feel will be helpful to the Fellows Review Committee. Particularly, what are the candidate's outstanding characteristics and significant contributions on which his or her recommendation is based?

Do you unequivocally recommend the candidate for Fellow status? Yes ___ No ___

Date _____ Your signature _____

Address: _____

Telephone Number: _____

E-mail address: _____

Please return this form to:

Doug Wiegmann, Ph.D.

University of Illinois

Aviation Research Laboratory

Willard Airport

#1 Airport Road

Savoy, Illinois 61874

[dwegman@uiuc.edu](mailto:dwiegman@uiuc.edu)

DEADLINE FOR RECEIPT OF NOMINATION MATERIALS IS FEBRUARY 2, 2004.

**Human Factors Engineering Technical
Advisory Group (DOD HFE TAG)
Meeting #49 – May 12-15, 2003**
By Steve Merriman

The 49th meeting of the DoD HFE TAG held in Augusta, Georgia. The meeting was chaired LCDR Sean Biggerstaff, MSC, PhD, PMA-205, Naval Air Systems Command (NAVAIR). Approximately 85 people attended the meeting, representing the US Army, US Navy, US Air Force, DISA/DTIC, NASA, FAA, several human factors-related technical societies and industry associations.

Plenary Session Presentations:

The DoD HFE TAG Chair for the 49th meeting, LCDR Sean Biggerstaff, welcomed attendees to the meeting and reviewed the theme for the meeting: *Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance.*

Welcome Address: Brigadier General Janet E. A. Hicks, Commanding General of the Signal Center and Fort Gordon, welcomed the TAG attendees to Augusta and Ft. Gordon. The current trend in the Army is trading armor for information superiority. This is reflected, for example in the new generation of armored vehicles built on the Striker baseline (a fraction of a tank's weight and very fast). Ft. Gordon's job is to get vast amounts of information across the battlefield, allowing first understanding and first action. "Information University" at Ft. Gordon has virtual campuses all around the country. There are currently 17,000 soldiers at Ft. Gordon.

Directorate of Combat Developments. Col Keith H. Snook, Director of Combat Developments (snookk@gordon.army.mil, (706) 791-6223), provided an overview of the DCD organization, where there are 30 military, 20 civilians and 32 contractor personnel (see Figure 1.) One of the major difficulties is getting the current procurement process to support current, rapidly growing and evolving needs. If something is needed in war, you can now purchase new Commercial Off-the-Shelf (COTS) equipment with the required capabilities. The issue is...does everyone need this "stuff" and do we need the Doctrine and Training to properly employ it?

Command Battle Laboratory. Col. Joe Yavorski, Director of the Command Battle Lab ([yaworski@gordon.army.mil](mailto:yavorski@gordon.army.mil), (706) 971-2557,) informed TAG attendees of the Purpose of Battle Labs is to jointly develop (with industry) required technologies and matching employment concepts. The Battle Lab Cooperative Simulation Environments can be used to evaluate new technologies and products, acting as an "honest broker." The triad of Battle Labs (Ft. Leavenworth - Leadership, Ft. Gordon - C4I and Ft. Huachuca - ISR) work together to evaluate emerging technologies and concepts. An example is when the Objective Force program took the Future Combat Systems (FCS) operational concepts for 2015 and overlaid state-of-the-art communications concepts for the same time period. They can simulate interfaces with joint forces and combat in multi-national environments. They can also help to point out "disconnects" between systems being acquired to fight in the same time frames. In this regard, DoD/Industry coordination is critical. Industry is not very "open" due to competitive pressures, so it is often difficult to get an accurate picture of how systems will work with one another in the next decade.

WIN-T. Mr. Bill Little spoke for the TRADOC System Manager of the **Warfighter Information Network – Tactical (WIN-T)**. WIN-T is the Signal Regiment's #1 priority. It is a mission-critical system. It is the integrating communications network for the Objective Force. It is the replacement architecture for several existing systems such as MSE, Tri-Tac and Trojan Spirit. It will be "owned, operated and maintained" by both signal and non-signal units. It will provide SATCOM terminals, voice communications and services, data communications, infrastructure and wireless communications *on-the-move*. Milestone "B" is July 2003. Initial units are to be equipped in FY-08.

SEA-03. Mr. David Anderson, Naval Sea Systems Command (andersonde@navsea.navy.mil, (202) 781-3608) provided an **Update on the NAVSEA HSI Directorate (SEA-03)**. The driving force behind this development is "Sea Power 21." Whereas the

“old” model of system development included only hardware and software, the “new” model includes people too. SEA-03 is responsible for measuring the degree to which people are considered in system development and is also responsible for certifying that they have been adequately integrated. SEA-03 was established by NAVSEANOTE 5400 of September 2002. It has a current staffing level of 32 personnel. Mr. Bob Bost, the technical director of SEA-03, may be reached at (202) 781-2653 or at bostjr@navsea.navy.mil.

SEA-03 has caused the following changes within NAVSEA:

- Development of Policy and Standards for the Command – NAVSEA 3900.8 was revised and many inputs were made to other requirements documents.
- Development of human performance metric and criteria – Initiated to define human performance metrics. Ten templates have been developed for different acquisition programs.
- Development and application of certification criteria - An HSI technical authority was established. HSI inputs are made to FORCENET and HSI is participating in a variety of programs such as LCS, CVN-21, etc.
- Support the revolution in training and Task Force Excel human performance-based initiatives – Currently educating the Navy workforce on HSI process and established human performance centers.
- Institutionalize HSI and systems engineering – Incorporating HSI into the system design process. Updating total system engineering instructions to include HSI. HSI is now reviewing project budgets to determine how much funding has been set aside for HSI. This review will be completed this year.
- Implement and integrate HSI policy, procedures and best practices – Currently educating PEO and NAVSEA work force. This item ensures that HSI stays a part of the process.

Joint Urban Operations. CAPT Michael Lillianthal, Assistant to the Deputy Under Secretary of Defense (Science and Technology) updated the attendees on **Urban Operations Initiatives.** CAPT Lillianthal indicated that there are lots of changes in progress – shifting from a requirements-based to a capability-based acquisition system, where the transformation capability attributes are: Knowledge, Agility, Survivability and Lethality. Operations are becoming more “Joint.” Planning starts with a Joint Vision and progresses to a Joint Concept of Operations, then to a Joint Integrated Architecture and finally to a Joint Capability. CAPT Lillianthal is focusing his attentions on Joint Urban Operations, or the “three block war.” There are three components of urban operations: Environment (e.g., air, space, undersea), Society (e.g., culture) and Infrastructure (e.g., power, water). The HSI challenges are:

- Urban areas are extremely dense
- It is much tougher to detect the enemy in this environment
- You have to sense the enemy – pull him out of a high noise environment
- Focusing on information operations
- Close combat (“knife fight in a phone booth”)
- Avoiding attrition
- Controlling the essential elements of warfare
- Minimizing collateral damage
- Separating combatants from the non-combatants
- Rapid restoration of basic services
- Preserving infrastructure
- Understanding the human dimension

Human Factors personnel are currently being added to the Joint Staff (J-9). A joint urban operations directive (DODD 5100.88) has been promulgated. Capt Lillianthal is wrestling with how to bring the various dimensions of HSI (M&P, simulation and training, human factors, habitability, survivability, medical, modeling, etc.) to bear on improving Joint Urban Operations. DUSD (S&T) will release a Joint Request for Information in the near future. Any and all serious suggestions would be gratefully received. CAPT

Lillianthal can be reached at:
michael.lillianthal@osd.mil.

Objective Force Warrior. Ms. Cynthia Blackwell, US Army Objective Force Warrior Technical Program Office (cynthia.blackwell@natick.army.mil, (508) 233-5210) spoke on **the Objective Force Warrior Technical Demonstration** (see Figure 2). There should be a considerable amount of funding available for HSI activities.

Major emphasis areas of the demonstration will be:

- Persistence in combat
- Augmented cognition/enhanced cognition
- Human performance assessment methods
- Advanced decision-making techniques
- Advanced training strategies (e.g., training-on-demand) and systems (e.g., virtual reality).
- Human performance enhancements
- Advanced system controls
- Situational awareness assessment (individual and group)
- System “Fight-ability”

Future Combat Systems. Mr. Michael Dresel with the FCS project at The Boeing Company (Michael.dresel@boeing.com, (253) 773-4153), discussed some of the HSI issues being faced by the **Future Combat Systems** team. The Boeing Company is teamed with General Dynamics and United Defense on this program; more subcontractors are expected to join up in August, 2003. Mr. Dresel’s area of activity centers on the design of manned ground combat vehicles, while other IPTs are concentrating on C4ISR and UAVs. The manned ground vehicles must be transportable via C-130-like aircraft and be able to “roll-off and fight.” “Pit-stop” engineering is being done to shave system maintenance time. Taking a system-of-systems (SOS) approach is proving to be critical to FCS success. An SOS user interface style guide already has been developed for use by all IPT technical personnel. Although contracts have just recently been let, Low Rate Initial Production is scheduled to begin in 2006!

FCS will consist of:

Eight different ground vehicles:

- Infantry Carrier
- Reconnaissance Vehicle
- Mounted Combat System
- Maintenance & Recovery Vehicle
- Medical Vehicle
- NLOS Mortar Vehicle
- Command & Control Vehicles

Manned and unmanned air vehicles.

FCS also will provide persistent ISR: connectivity to Joint Stars, Global Hawk, U-2, National Systems, UAVs, SUAVs, mast-mounted sensors, etc. There will be lots of embedded training incorporated into every vehicle.

Training/rehearsal will be possible while personnel are being transported. Sign-in will be by smart card. There will be on-board prognostics/diagnostics and a condition-based maintenance will be implemented. Commonality will be maximized between vehicle systems. It is envisioned that a common Driver-Commander station set will be developed for all vehicles.

C4ISR Knowledge Base. Dr. James Geddie, acting Chief Scientist with the Human Systems Information Analysis Center, HSIAC (geddie.hsiac@usa.com, (254) 698-6405), briefly described an investigative effort to develop a “Lincoln-Boff-like” compendium for C4ISR human systems integration issues. Dr. Geddie has developed a bulletin board to facilitate this activity – http://groups.hahoo.com/group/TAG_C4ISR. The next step is to agree on architecture, prototype a small segment of the knowledge base to illustrate the concept, and present it to Dr. Foster at DDR&E in the near future.

Sub-Group Meetings Attended at the DoD HFE TAG:

Human Factors in Extreme Environments. Mr. Brad Collie of the US Navy Coastal Systems Station (colliebe@ncsc.navy.mil, (850) 234-4744) chaired the meeting. The first speaker was Dr. Mark Bing, with the Naval Medical Submarine Research Laboratory (bing@nsmrl.navy.mil, (860) 694-2460), who spoke on **Psychological Screening of Submariners**. At least 40% of Navy

recruits fail to complete their first enlistment. Psychological disorders are the leading cause of hospitalization. In the submariner force, the big problems are: psychological dysfunction, misconduct, substance abuse and “11th hour” attrition (that causes manpower shortages just as the submarine is ready to deploy). The current screening program (MANMEDARTICLE 1562(i) “SUBSCREEN”) has been used since 1986 as the standardized psychological test (200 items). This test measures five dimensions:

- Procedural scales (e.g., faking)
- Submariner scales (e.g., problems submerging)
- Affective scales (e.g., mood anxiety)
- Socialization scales (e.g., aggressive-destructive social isolation)
- Additional scales (e.g., suicide, claustrophobia)

SUBSCREEN is administered at the Basic Enlisted Submarine School (BESS). At BESS alone, there are about 70,000 records available in their database. Following testing, one in 10 sailors is referred to the base psychiatrist where he/she may be administered the Minnesota Multi-phasic Personality Inventory (MMPI). Of those referred to a psychiatrist, 70% are determined to be qualified for submarine duty, 10% are unqualified for submarine duty and are routed to surface fleet positions, and 20% are unqualified and are discharged from the Navy. In all, about 3% of the personnel are removed from the submarine pipeline based on this test. Even with this screening program, COMSUBLANT reported having to MedEvac 13 psychological cases from submarines in 2002 (11 of whom were suicidal and 3 of whom halted operations). To improve screening, an algorithm was developed to predict the percent probable candidates will be successful or unsuccessful.

- Successful candidates - defined as length of service of 4.25-22 years, all reenlisted, Rank of E4-E9.
- Unsuccessful candidates - defined as length of service up to 14 months, none reenlisted, rank of E2.

The algorithm does a reasonably good job of predicting attrition in general, or those going to the brig or those going to mast. Overall goals for this improved screening are:

- Reduce 11th hour attrition
- Maintenance of required manpower levels in submarines
- Improved operational readiness
- Reduction in operational reduction by preventing psychologically-based MedEvacs
- Support CNO’s attrition-reduction initiatives
- Answer GAO recommendation for improved personnel screening.

The SUBSCREEN tool is also administered at the Submarine Officers Basic Course (SOBC).

The next presentation was by Ms. Regan Campbell with the US Navy Coastal Systems Station (campbellrh@ncsc.navy.mil, (850) 234-4838), who spoke on **Human Factors in Underwater Environments**. The diving environment is characterized by:

- Pressure effects (on hearing, strength, decompression)
- Water effects (resistance, tides and currents)
- Underwater vision (low light, loss of acuity)
- Underwater sound and hearing (sound localization difficulties)

Occupational safety issues include physical stress and psychological stresses. Design considerations for this environment include: life support systems, protection from the elements, minimizing performance decrements, work environment design and communications. The HFE approach to underwater assessment follows a normal progression:

- Task analysis
- Bench test (check against ISO and other standards)
- Dry manned test
- Manned test in controlled, wet environment (e.g., pool)
- Manned operational test in wet environment.

Some of the challenges encountered in designing for diving environments include:

- Unavailability of task analyses
- Lack of anthropometric data for the diving community
- Lack of quantitative methods
- Changing specifications
- Resource limitations
- The Human Factors engineer is not usually representative of the typical end-user
- Experience and motivation

Human Factors Standardization (HFS) Mr. Alan Poston, FAA, chaired the meeting (alan.poston@faa.gov). The Sub TAG website is: <http://dtica.dtic.mil/hftag/hfs.html>. The new DODD 5000.2 was recently released; it incorporates an HSI attachment with specific direction to the Project Manager.

MIL-STD-1472F. Section 5.6 Physical Accommodation has caused some concerns due to a printing error. That has been corrected. Mr. Poston received several other comments regarding MIL-STD-1472 that were discussed during the meeting and voted on. Next year, MIL-STD-1472 is up for its five-year review.

MIL-STD-1787: No input.

MIL-STD-882D: The human exposure dimension was not added as suggested by human factors professionals.

Human Factors and Ergonomics Society (HFES)/ISO/TC159: Clair Gordon is working on standardization for the society. A report will be provided at the Fall DOD HFE TAFG meeting.

Joint Services Specification Guide: No input.

NASA MSIS: Data Item Descriptions (DIDs): No input.

Data Item Descriptions: The US Navy is attempting to transfer six human factors DIDs to navy cognizance. If successful, all agencies could cite them in contracts.

- DI-HFAC-80740, Human Engineering Program Plan
- DI-HFAC-80742, Human Engineering Simulation Approach
- DI-HFAC-80745, Human Engineering Systems Analysis Report
- DI-HFAC-80746, HEDAD-Operator
- DI-HFAC-80747, HEDAD-Maintainer

- HI-HFAC-81399, Task Analysis/Task Allocation Report

FAA Design Standard: Mr. Poston reported that the 1,007 page “guide” was being updated and reformatted as a standard. The point of contact at the FAA is Ms. Vicki Ahlstrom.

Gateway: Mr. Tom Metzler (HSIAC) indicated that the June, 2003 HSIAC *Gateway* publication would feature eight articles on human factors standards.

- History of Military Human Factors Standards – Joe McDaniel, Ph.D.
- Human Factors Data Item Descriptions – Jen Narkevicius, Ph.D.
- Human Factors Engineering Requirements of International Space Station – Mihriban Whitmore
- HSI in Systems Engineering Standards – John Winters
- I’ll Take The Screaming Cows – Vicki Ahlstrom
- Joint Services Specification Guide – Joe McDaniel, Ph.D.
- Managing the Human Factors Standardization Plan – Lee Gray
- Current State of Human Factors Standardization – Al Poston

Mr. Poston agreed to stay on as chair of the HFS Sub TAG for the time being. He indicated that Mr. Lou Adams (EIA Rep to the TAG) had mentioned that EIA HEB-1 human engineering bulletin had been cited in the JSF contract.

New Business: 1LT Amy Snapp, Edwards AFB (amy.snapp@edwards.af.mil, (661) 277-0800 x2279) indicated that the lifting data provided in MIL-STD-1472 are not adequate in most design circumstances. There were suggestions made during the Sub TAG meeting that a strength/lifting data handbook would be extremely useful to designers. It was requested that the TS/I and HFS Sub TAGs identify problems in this area to the DOD HFE TAG via Human Factors submissions to the Hot Issue document.

Human Modeling and Simulation. LT Jim Patrey, HQ USAFA/DFBL (jim.patrey@usafa.af.mil, (719) 333-9891) chaired the meeting for LT Joseph Cohn who could not attend. The first presenter was Dr. Kay Stanney (kay@designinteractive.net, (407) 977-5498), who discussed **Human Factors Engineering Principles in User-Centered Design**. Her message was that systems engineers and HF engineers often have difficulty cooperating on design teams because they seem to have different priorities, difficulty with communications and rigid behavior that result in antagonism. She believes that the onus is on the human factors engineers to bridge the communications gap by adopting systems engineering language and processes.

The next speaker was Mr. David Gross, Boeing-Huntsville (david.c.gross@boeing.com, (256) 461-3294) who spoke on the **Development and Testing of New Approaches to HFE Modeling in C4ISR Systems**. The C4ISR “problem” is that:

- Military operations depend heavily upon C4ISR
- Current C4ISR systems create only data
- Current C4ISR systems rarely enable understanding
- C4ISR is a prime driver of system requirements

C4ISR systems:

- Operate in highly uncertain time-varying environments
- Have no “enemy”
- Involve a heterogeneous group of operators
- Require contextual and specialized knowledge that is frequently unavailable
- Are often characterized by severe time pressure

In view of the above, it is particularly difficult to select meaningful, unambiguous measures of merit for C4ISR systems. Simulation is the preferred approach for testing C4ISR approaches and concepts because it can be used for experimenting, prediction, communicating amongst team members about the concept, thinking about the concept and training. Human Behavioral Models

(HBR) also may be useful in evaluating HFE portions of C4ISR concepts:

- CAPE (Mitre) C4ISR Analytic Performance Evaluation
- JVB Common Battlespace
- Jack TM and other similar models
- Inductive Process Modeling (e.g., neural networks)
- Visualization

The next speaker was Robert Allen, Ph.D. from NAVAIR, Orlando (Robert.allen@navy.mil, (407) 380-4773), who spoke on **Practical Applications of Virtual Reality Technology**. He presented overviews of two VIRTE (Virtual Technology Environment) systems:

- Advanced Amphibious Assault Vehicle (AAAV)
- Combined Arms Command and Control Trainer Upgrade System (CACCTUS)

System Safety/Health Hazards/Survivability.

Mr. Ben Gibson, AMEDDC&S (ben.Gibson@amedd.army.mil, (210) 221-1622) and Mr. Stephen Merriman, The Boeing Company, (stephen.c.merriman@boeing.com, (972) 344-7578) co-chaired the meeting. The first speaker was Mr. Gibson who described the **Role of the Directorate of Combat and Doctrine Developments** at Ft. Sam Houston. Their role is to identify health hazards with Army materiel, such as chemical/biological, radiation, oxygen deficiency, shock, temperature extremes and trauma. US Army Regulation 40-10 requires the review of all health hazards prior to milestone “B.” The directorate reviews the ORD, regulations and guidance documents, MANPRINT plans and outlines of test plans. The Directorate assists other schools, combat developers and functional proponents in the early identification of health hazards. The US Army has exempted medical products from Army HSI requirements. This is because medical products go through a five to seven year Food and Drug Administration (FDA) approval process that includes HSI requirements.

The next speaker was Judy Orasanu, Ph. D., NASA Ames Research Center (Judith.orasanu@nasa.gov, (650) 604-3404) who

discussed **Human and Organizational Risk Management**. The Challenger, MARS Lander and Columbia mishaps were clearly examples of organizational failure. The problem in each instance involved “normalization of deviance.” In other words, after multiple, minor out-of-tolerance situations had been experienced without adverse effect, no action was taken when a slightly more out of tolerance situation occurred. Schedule pressure also may have contributed to NASA’s failure to recognize problems. Organizational failures are being examined by NASA as a result of these catastrophes. Some of the questions being asked are:

- How do organizations perceive and manage risk? Risk perception involves multiple perspectives and meanings. Risk perception is related to decision making and actions. Risk perception is usually implicit.
- How do organizations manage knowledge?
- How do we develop models to better represent and support processed of risk and knowledge management?
- How do we use these models to design and better deploy better decision support technologies?

The focus of this work is on the collaboration process: communications, information sharing and dealing with situations in which the need for “face saving” may occur. Research issues include individual and shared perception of risk, communication of risk attitudes and safety norms in organizations, management of competing goals and shift handover (day shift workers providing handover briefs to night shift workers, etc.). Risks are perceived in a variety of ways:

- safety risk
- economic risk
- productivity risk (e.g., loss of hours)
- resource risk (e.g., capability loss)
- public risk (e.g., public confidence)
- individual risks (social/psychological and professional).

The risk model being developed by NASA should be validated by June 30, 2003.

Technical Society/Industry Sub-Group. The Technical Society/Industry (TS/I) Sub TAG met twice during TAG #49 on Tuesday morning and afternoon. Twelve participants attended the T/SI meetings, representing a variety of technical societies and industry groups. Mr. Bill Lytle (William.b.lytle@lmco.com, (303) 971-8972) chaired the meetings. TS/I Attendees introduced themselves and updated the TS/I membership rosters.

Hot Issues: No inputs were received.

Web Site: Mr. Lytle reinforced to the members that they should submit newsworthy items to Ms. Teresa Alley (MATRIS) who will up-load them to the TS/I web site (<http://hfetag.dtic.mil/tsi.html>). A variety of announcements, events, publications, etc. are available via the TS/I page.

Joint Warfighter Capability Objectives

(JWCO) Review: CDR Sean Biggerstaff, TAG chair, solicited inputs on the JWCO capability objectives. The TS/I Sub TAG is free to input comments on any of the capability areas.

Student Outreach: Bill Lytle indicated that he would try to reach out to local colleges and universities to stimulate interest in the TAG.

Human Systems (HS)/Information Systems (IS) Collaboration in User System Interface

Development: Mr. Steve Merriman described an activity that applied recommendations made at a DOD Workshop held at The Massachusetts Institute of Technology (M.I.T) Lincoln Laboratories in July, 2001. Increased collaboration between human factors (Human Systems) and Software Engineering (Information Systems) specialists was implemented by The Boeing Company on an advanced, complex system design. This paper described their enhanced, collaborative approach that emphasized:

- Human Systems, Systems Engineering, Training Systems and Information Systems disciplines in the same IPT
- Activity-wide application of User-System Interface (USI) Standards
- USI process integration of HS, IS, SE, TS, System Safety (SS) & End-Users (or Surrogates)

- Use of a common USI scenario by all USI developers and trainers
- Embedding of USI-knowledgeable software engineers on SW task teams and “double-hatting” of these SW engineers onto the HSI task team.
- Design/Procedure Brief & USI Checklist (ensure completeness & consistency)
- Risk-Driven USI Design Scheduling and Prototyping
- Joint USI Testing by HS, IS and TS (low-level, computer system configuration item (CSCI), sub-system and system testing)
- Early and repeated operational assessment by end-users
- Strict USI design and USIS configuration control.

The main benefits of employing an HSI collaborative approach to user interface development were improved management of cost, schedule and risk; improved compliance with USI standards; more intuitive USI “look and feel,” better USI consistency across subsystems, minimized number of operator actions for high priority operations, enhanced crew safety and minimized operator workload. Increased HSI collaboration was recommended for future, large-scale, complex system development efforts.

Sustained/Continuous Operations (SUSOPS/CONOPS).

Presentations included:

The Effects of Caffeine, Sleep, Deprivation and High Stress Military Training on Marksmanship, Vigilance and Mood.

William J. Tharion and Harris R. Lieberman, Institute: U.S. Army Research Institute of Environmental Medicine, Natick, MA 01760
Actigraphy in the Identification of “Long-” and “Short-Sleepers”: Individual Differences in Sleep and a Need for a Common Normative Actigraphy Database in Sleep Research

Walter Carr, Bart Phillips, & Sean P. A. Drummond. Naval Health Research Center (NHRC), San Diego, CA & University of California San Diego/Veterans Affairs San Diego Healthcare System (VASDHS)

Shiftwork and Fatigue Research in Air Traffic Control

Thomas Nesthus, Albert Boquet, Crystal Cruz, Kali Holcomb and Lena Dobbins, Civil Aerospace Medical Institute, Oklahoma City, OK

Tri-Service Workload Coordinating. CDR Karl Van Orden, the chair of the Sub TAG, provided an introduction to the meeting by describing some applications of physiological modeling. Eye blink and duration increase with human error rate. Eye fixation activity decreases with increased error rate. Pupil dilation decreases with increasing error rates. These data were fed into a neural network and it predicted human performance very closely based solely on eye activity. Why investigate workload? Increasing workload measurements can indicate increased fatigue, loss of situational awareness, or confusion. CDR Van Orden indicated that DARPA is currently comparing different workload measures.

The next presenter was Erik S. Viirre, M.D, Ph.D. ((858) 336-0317) who spoke on **Eye Activity and Operator State**. Dr. Viirre is with the Naval Health Research Center and U.C.S.D Cognitive Science. Dr. Viirre listed primary uses of eye behavior:

- Control (needs training to avoid such phenomena as the “Colonel’s Daughter”)
- Aiming/Targeting (difficult to accomplish-calibration is critical)
- Neural State Estimation (non-interfering, calibration less critical, may require less resolution to be effective)

Dr. Viirre listed various eye behaviors subject to measurement such as saccades, blink, VOR, OKN, pursuit and vergence plus pupil diameter. He concluded his presentation by stating that it may be feasible to measure neural state in real time with eye movements. He indicated that better measures were being sought.

The last speaker was Dr. Glenn Osga, Naval Warfare Systems Center, San Diego (osga@spawar.navy.mil, (619) 553-3644), who spoke on **Tactical Team Workload**. Dr. Osga and

Mr. Joe DeVita are conducting the research. They are studying team behavior on defensive warfare tasks where they are investigating workflow and team information processing. They are attempting to represent tracks in a manner such that the operators know how much information exists on each track, how well the different types of information on a track are correlated, etc. The goal is to have teams “look at” each contact/track but spend relatively more of their time on the most ambiguous tracks, thereby making better decisions about the committal of scarce defensive assets.

Human Factors Engineering/Human Systems Integration: Management and Applications.

The first speaker was Ms. Nancy Dolan, CNO-N125 (nancy.dolan@navy.mil, (703) 614-5781), who provided an **Update on Navy HSI**. External policy documents covering HSI are CJS13170 and DODD 5000.2. External guidance is provided by OUSD (P&R) and Title 10 to the US code.

Internal Navy policy is provided by manpower Key Performance Parameters (KPP), SEAPRINT, etc. The Navy Post Graduate School in Monterey, CA is now providing a two-year Masters Degree program in Human Systems Integration, with the first class in the fall of 2003. Dr. Nita Miller is the NPGS point of contact. NPGS also is hosting a seminar series in HSI and they are looking for professionals to come and present lectures. The Navy Bureau of Personnel is currently investigating whether or not to provide a separate series for HSI professionals. CNO (N-125) is the Navy-wide sponsor for HSI, established in 1997. The systems commands are also taking steps to establish and sustain HSI:

- NAVSEA: Established SEA-03 HSI Directorate in 2002. Established HSI certification authority. Developing HSI Policy and Standards. Establishing total ship training roadmap.
- NAVAIR: Established HSI Management Board in 2002 (members represent all of the various HSI competencies. Management Board serves as the systems command HSI advocate.
- SPAWAR: Established HSI organization in San Diego in April 2003; this is the HSI

management authority for the command. Beginning to look into the need for developing of standards and policy as well as providing program support.

The Navy has established the “SEAPRINT” program with a \$1 million Congressional “plus-up” to establish a MANPRINT-like approach in Navy acquisition. SEAPRINT will develop HSI concepts, processes and tools. The philosophy is that:

- Sailors are key enablers of operational capabilities.
- HSI requirements must be design drivers, not consequences.
- Affordability is measured in both dollars and sailors.
- Strategic manpower management is required for total workforce alignment.

The SEAPRINT technical approach integrates HSI domain analyses (M, P, T, and HFE), integrates HSI into acquisition and systems engineering, and integrates new processes (e.g., Sea Warrior, TFXL) with existing processes. There is also an emerging SEAPRINT toolset, consisting of: SkillsNET (a commercial organizational management tool), IMPRINT (task analysis tool developed by the Army), Peoplesoft and SMART. HSI is really getting the chance to impact on acquisition documents such as the ICD, CDD and CPD.

SEAPRINT FY03 goals are as follows:

- Navy-wide MPT/HSI integrated policy in acquisition
 - HSI Plan
 - HSI Implications and Constraints ICD
 - Target Audience Description (TAD)
 - Capability-based, testable requirements in CDD and CPD
 - Human in the Loop testing and simulation
 - HSI assessments

Enablers of the SEAPRINT thrust are strong USN support, Congressional “seed” money, strong OSD

support and an enterprise-wide approach by the Navy. Current stumbling blocks include;

- No resolution yet on HSI KPPs (Key Performance Parameters)
- MER (Manpower Estimate Report) is in jeopardy
- Lack of Navy investment in HSI tools.
- Lack of (or weakness of) DOD requirements and acquisition policy
- Lack of HSI community integration

The next speaker, Mr. Rick Anders, ARL HRED (anders@gordon.army.mil, (706) 791-8354) spoke on the “**User Jury**” **Concept** where in developers visit system users (operators and maintainers) in the field to obtain feedback on usability and related issues.

The next speaker was Mr. Adrian Salinas, 311 Human Systems Wing/XPRA (Adrian.salinas@brooks.af.mil, (210) 536-4428), updated attendees on USAF HSI. A new draft of AFI-63-112, Cockpit Working Group, is in development that incorporates HSI language.

The last speaker was Mr. Brad Collie, a human factors engineer with the US Navy Coastal Systems Station (colliebe@ncsc.navy.mil, (850) 234-4744) spoke on **Challenges in Implementing HSI at the Coastal Systems Station**. This involves applying HSI principles and criteria to the design and operation of underwater systems for SEALs, fast boats, swimmer delivery vehicles, masks, re-breathers, etc. Mr. Collie has participated in training operations with the SEALs in order to better understand their unique problems, mission environments and issues.

Human Factors User Feedback Interest Group.

The Human Factors User Feedback Special Interest Group met for the first time on Wednesday, 14 May 2003, during TAG #49. Nine attendees participated in the meeting, representing several technical societies, the US Navy and US Army.

Mr. Fred Oberman (NAVSEA), initiator of the interest group was unable to attend this TAG meeting. Mr. Kevin Bracken of Chi Systems, Inc. (kbracken@chisystems.com, (215) 542-1680 x127) and Mr. Steve Merriman of The Boeing Company (Stephen.c.merriman@boeing.com, (972) 344-7578) co-chaired the meeting in his absence. An opening chart was presented to the group (nine attendees) that presented the group’s goals, as follows:

- We share an interest in designing systems that are safe, efficient, cost-effective, and maximize work performance
- We believe the intended system user needs to be represented throughout the acquisition process (or we would be getting ready for the Social right now)
- We want to explore the boundaries of this issue and flesh out some of the critical considerations
- We want to hear what you have to say on the issue & learn more about how various communities are dealing with this
- We want to leave here with a plan for further exploration of this issue by the TAG

The first speaker was Steve Merriman, who described how the Naval Air Systems Command (NAVAIR) acquired end-user input into the F/A-18 aircraft and other system acquisition programs (e.g., A-6F, EC-130Q, F-14D, AV-8B). The presentation was based on NAVAIR Instruction 5420.38 that describes a standardized process for obtain user input into the design of US Navy and Marine Corps aviation systems. User input is obtained from aircrew using “Aircrew Systems Advisory Panels” or ASAPs. User input is obtained from maintainers using “Maintainer Advisory Panels,” or MAPs. . This concept was institutionalized by NAVAIR to ensure that the benefits of these groups would be experienced in future programs.

Key points made about user inputs were that they should be:

- Timely and based on the latest representation of user interfaces available

- Appropriate in terms of “type” (problem rather than solution oriented)
- Bounded (limits placed in terms of scope)
- Consistent (implying knowledge and documentation of previous comments)
- Advisory only (not direction)
- Input to the right level in the development organization
- Subjected to a well-defined assessment process by the acquisition agency.

Key points made about end-users involved in this process were:

- User groups should be organized and users should not be encumbered with administrative duties (it takes a lot of work by others to allow them to function smoothly)
- End users should be appropriate to the task and stage of development
- End User groups should be politically unencumbered
- End User groups should be funded by the PM

The second speaker was Mr. Kevin Bracken who described an example from Naval aviation involving an Instructional Systems Advisory Team (ISAT) that was a group analogous to the ASAP and MAP, but focused on F/A-18 training system design and development. ISAT membership required a 3 year obligation. Members were stationed at the Prime contractor’s facility. The ISAT provides:

- Attention to the “trainability” aspects of evolving system before PDR and CDR,
- Guidance to the prime contractor and subcontractors on Navy training policies, procedures and guidelines
- In-process review of evolving training system hardware, software and courseware
- Assistance in initial factory training conduct and evaluation
- A source of (on-site) domain expertise in areas such as:
 - Technical publications verification
 - Mockup & development fixture reviews

- Integrated Logistic Support & R&M activities
- Liaison with other fleet user groups

When establishing user groups, a number of considerations must be dealt with by the acquisition agency.

Mr. Bracken ended his presentation with the following conclusions:

- There is a long history of user involvement in training system and weapon system design
- There are the same considerations as with user involvement with weapon system design, but more.
- It takes special people to fill this role
- Bringing users into system design is rewarding, but you must be careful to avoid the pitfalls
- Attention and funding is needed to insure that users get adequate input into design, but caution must be used

Following the presentations, it was agreed to work more on bounding the interest group, define its goals more definitively and prepare for the next meeting. One thought was to do the following and then disband the interest group:

1. Identify all DOD service regulations, instructions, guidelines and standard operating procedures pertaining to user review groups.
2. Define general guidelines for user review groups, based on review and synthesis of the above materials.
3. “Publish” the guidelines on the DoD HFE TAG web page and elsewhere as appropriate.

CALL FOR NOMINATIONS FOR ASHFA PRESIDENT-ELECT AND MEMBER- AT- LARGE.

Nominations are currently being sought for the position of AsHFA President-Elect and Member-at-Large. If you know of a colleague (or perhaps you, yourself?) who you feel would best serve our organization in its highest executive leadership positions, please consider nominating that individual today. Please seek and obtain their consent *before* nominating them! All nominations (and any questions about the position or nomination process) should be sent directly to the current AsHFA President-Elect, CAPT David F. Neri:

CAPT David F. Neri
Office of Naval Research (ONR 342)
Ballston Tower One
800 N. Quincy Street
Arlington, VA 22217

Fax: 703-696-2177

nerid@onr.navy.mil

Rank-ordered nomination for President (1 = first choice):

1.) _____

2.) _____

3.) _____

Rank-ordered nomination for Member at Large (1 = first choice):

1.) _____

2.) _____

3.) _____

Deadline for nominations is 2 Feb 04.



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

NEWSLETTER

AshFA Newsletter return address

Ray King
3812 Buckingham Dr
Norman, OK 73072

ADDRESS CORRECTION REQUESTED