

## U.S. Department of Defense Publishes Major Revision to Human Engineering Standard

By John Lockett

All good craftspeople know how important it is to take care of their tools; the products they produce, not to mention their livelihoods, depend on them. Until recently, one of the most important tools in human factors engineering had not had a thorough technical review since the late 1980s. Military standard 1472, Department of Defense Design Criteria Standard – Human Engineering, is often cited in the procurement, development, and testing of systems, but after surviving the purge of many DoD standards in the 1990s, interest and resources for maintaining it were scarce. In this article, I review briefly the history of the military standard and efforts to update it, especially those of the government working group formed in 2008.

MIL-STD-1472D was promulgated in March 1989 and addressed the level of technology that existed through 1987 or 1988. The “E” revision, promulgated in 1996, was mostly cosmetic; the text was changed to a nonproportional font to reduce white space. The “F” revision, promulgated in 1999, consisted mainly of moving anthropometric data from MIL-STD-1472 to military handbook 759 (MIL-HDBK-759), but little else was done at that time. As a result, some requirements and design criteria in previous versions of MIL-STD-1472 were no longer applicable to current technology.

To address today’s technology and the recognition that future systems will depend on greater cognitive processing on the part of human operators, maintainers, and support personnel, a working group was formed in 2008 to revise the standard. The group consisted of representatives from the Army Research Laboratory, Naval Sea Systems Command (with excellent supporting contractors), Air Force Research Laboratory, and the Army Public Health Command. The Federal Aviation Administration and NASA provided assistance and insights gained from the development and update of their respective human engineering standards.

To update MIL-STD-1472 F, the working group began with more than 200 suggested revisions from a variety of sources, including a peer-review survey, previous surveys, submissions to the Army proponent for the standard, and known military services needs. The peer-review survey was used to help prioritize topics for updating (Nesteruk, 2009). It also revealed that although a majority of the participants expressed a preference for an electronic version of the standard, many users still wished to maintain a hard-copy version. The working group then agreed on areas in need of revision, prioritized the needed revisions, and identified potential sources of data. Topics for updating that exceeded the resources of the working group to examine, or for which insufficient definitive research existed, were deferred for a later revision of the standard.

The changes made in the “G” revision are substantial:

- The organizational structure of the standard was revamped to group similar material in the same section of the document.
- Obsolete provisions (e.g., references to dot-matrix printers) were deleted, out-of-date provisions were updated to reflect the latest research, and new provisions were added to address emerging technologies.

- Extensive content from MIL-HDBK-759 was added throughout the standard.
- Many figures and tables were updated.
- Where appropriate, recommendations were changed to requirements, and wording of criteria was modified to be more direct.
- Multiple requirements were split into individual statements where appropriate.
- Errors in MIL-STD-1472F were corrected and additional references were added
- The table of contents, tables, figures, and embedded references to sections were hyperlinked.

The format for DoD standards is not completely flexible; a standard for writing military standards, MIL-STD-962, governs format. This meant that the basic outline for the revised standard was set and the working group was unable to incorporate multimedia content or embedded tools.

The draft revised standard was reviewed extensively by 131 individuals throughout government and industry organizations, including HFES. The working group adjudicated more than 600 comments. The revised standard, MIL-STD-1472G, can be found at <http://assistdocs.com>.

The working group plans to incorporate the results of the U.S. Army's latest anthropometry survey (now under way) as a change notice to the standard. If resources permit, the list of deferred update topics will be addressed in an "H" revision.

Although the "G" revision of military standard 1472 is limited in the number of new technologies that are covered, it represents a major improvement over the previous version. Topics are hyperlinked and grouped more logically. Obsolete content has been removed, and users will no longer have to switch between the handbook and standard to find the information they need. Because compound requirement statements have been separated and reworded whenever possible to be more measurable, it should be easier to cite and test requirements in procurements. This should result in a stronger position for human factors engineering throughout military acquisition.

## Reference

Nesteruk, H. (2009). Assessing the human factors of a human engineering standard. In *Proceedings of the Human Factors and Ergonomics Society 53rd Annual Meeting* (pp. 1820-1824). Santa Monica, CA: Human Factors and Ergonomics Society.

*John Lockett is chief of the MANPRINT Methods and Analysis Branch at the U.S Army Research Laboratory, Human Research and Engineering Directorate. He has more than 25 years' research and development experience in human factors and has concentrated on the application of workload analysis and human figure modeling technologies to MANPRINT, the U.S. Army's human-systems integration program.*

## ANNUAL MEETING

# Reserve Your Hotel Room at the Westin Boston Waterfront

Human Factors and Ergonomics Society  
56th Annual Meeting



October 22-26, 2012  
Westin Boston Waterfront  
Boston, Massachusetts USA

The HFES 56th Annual Meeting will take place from October 22 to 26 at the Westin Boston Waterfront Hotel. Reserve your room at <http://bit.ly/HclKNm> to take advantage of the HFES group rate of \$259/night single or double occupancy. This rate applies for stays between October 19 and 27, and the rate expires on September 28 or whenever the HFES block is sold out.

# Support HFES With an Annual Meeting Sponsorship

The HFES 2012 Annual Meeting is an opportunity to promote your organization's products and services to our attendees. Reserving your sponsorship is easy with our online sponsorship reservation site. Details are available at <http://bit.ly/HaqbN9>. Credit card transactions are secure, and you can also pay by check. (If you need a pro-forma invoice, please contact [registration@meetingplanners.com](mailto:registration@meetingplanners.com).)

## Increase Your Visibility

All Annual Meeting sponsors receive significant recognition through listings in the following:

- Annual Meeting Program
- on-site signage
- on-site daily newsletter

In addition, your organization's logo and name are included on the Sponsors page at the HFES Web site, with links to your Web site. Sponsors also receive 10% off the cost of advertising in the daily on-site newsletter, the *HFES Bulletin*, the Annual Meeting program, and *Ergonomics in Design*. All advertising opportunities may be viewed at <http://www.hfes.org/web/HFESMeetings/2012AMExhibitAd.pdf>.

The following sponsorship opportunities are available.

**Internet Café – \$5,000 or two \$2,500 sponsorships.** Up to two sponsorships are available. Simply provide a screensaver with your company logo for display on monitors at the free e-mail stations for attendees. This heavily utilized service is an excellent way to increase your visibility. Also includes signage; logo mousepads will be displayed if supplied by the sponsor (10 stations).

**Coffee & Refreshment Breaks – \$2,500.** Up to nine sponsorships are available. Coffee and beverage breaks are offered in the Exhibit Hall and other locations Tuesday through Thursday morning and afternoon and on Friday morning. Attendees use these breaks to visit the exhibits and network with colleagues. Signs bearing the sponsor's name and logo will be placed in the area. The sponsor's representatives are encouraged to meet and greet attendees in the coffee break areas.

If you are interested in sponsoring or cosponsoring the **Opening Plenary Session**, which takes place on Tuesday, October 23, please contact HFES Executive Director Lynn Strother, 310/394-1811, [lynn@hfes.org](mailto:lynn@hfes.org). The Opening Plenary Session features the keynote address, presidential address, and presentation of HFES awards and newly elected fellows. This session, which kicks off the four-day technical program, traditionally attracts up to 800 attendees.

## Focus on Students

**Student Reception – \$3,000 single sponsor or three \$1,000 sponsorships.** Up to three sponsorships are available. Each year, about 200 students gather on Tuesday evening (October 23) to enjoy refreshments and camaraderie. Awards are also presented. Signs bearing the sponsor's name and logo will be placed at the door and in an acknowledgment made during the program.

**Student Lounge – \$1,000/day or \$5,000/week.** Up to five sponsorships are available. The lounge provides a relaxing atmosphere for networking and mentoring. Sponsor(s) will be acknowledged in signage and may display information about the organization.

**Mentoring Luncheons – \$2,400 or three \$800 sponsorships.** Up to three sponsorships are available. Three luncheons (12:00 noon–1:30 p.m. on Tuesday–Thursday, October 23–25) will be held to provide students and early-career professionals with information and opportunities to develop mentoring relationships with established professionals in the human factors/ergonomics field.

**Student Chapter Presidents Luncheon/Business Meeting – \$1,000 or two \$500 sponsorships.** Up to two sponsorships are available. Here is another opportunity to promote your organization to future designers, researchers, and leaders in the human factors/ergonomics field. Student chapter presidents are provided with a complimentary lunch. Signs bearing the sponsor's name and logo will be placed at the door.

**Student Career and Professional Development Day Afternoon Break – \$1,500 or three \$500 sponsorships.** Up to three sponsorships are available. Student Career and Professional Development Day is a full-day program on Monday, October 22, and is geared toward helping students prepare for a career in the HF/E field. This sponsorship provides an opportunity to reach out to future HF/E professionals and includes signage bearing the sponsor's name and logo.

**Early-Career Professionals Reception – \$3,000 or three \$1,000 sponsorships.** Up to three sponsorships are available. This social event, on Wednesday, October 24, will enable young professionals to network with attendees from industry and academia. The social is followed by a short program that will target specific topics of concern to early-career professionals.

#### **How to Reserve a Sponsorship**

Please visit the online reservation site (<http://events.signup4.com/HFES2012Exhibitors>) and click the "Register" link at the top of the page (even if you are not booking exhibit space). If you prefer, you may download, complete, and return the Exhibitor/Sponsor Contract (<http://www.hfes.org/Web/HFESMeetings/2012ExhibitContract.pdf>). Sponsorships are allocated on a first-come, first-served basis on receipt of payment. NOTE: Sponsorships must be paid in full no later than 30 days from the reservation date.

For information, including ideas for sponsorships not included here, please contact Dick Bublitz, 800/485-5029, 818/992-0366, [dickbublitz@sbcglobal.net](mailto:dickbublitz@sbcglobal.net).

## **Call for Student Volunteers**

HFES invites full-time students to serve as student volunteers for the 56th Annual Meeting. Student volunteers perform many essential functions and help to ensure that the Annual Meeting runs smoothly.

First preference will be given to current HFES Student Affiliate members. **Students applying to volunteer must preregister by September 10, 2012.** Registration opens in July. To volunteer, please send the following information to the e-mail address below:

- your contact information (including your full name and e-mail address)
- your first, second, and third choices from the list of key areas given below
- your anticipated date of arrival at and departure from the meeting.

Address all requests to Director of Member Services Carlos de Falla, [carlos@hfes.org](mailto:carlos@hfes.org).

You may request assignments in specific areas, and every effort will be made to ensure you receive your first or second choice. Volunteer positions are limited to about 50 slots, and requests will be accepted on a first-come, first-served basis. Help is needed in (but not limited to) the following key areas:

- Workshops (Monday, October 22)
- On-Site Career Center (October 23–25)
- Daily on-site newsletter (October 22–24)
- Poster sessions (October 23–26)
- Internet stations (October 22–26)

Assignments will be made and instructions sent prior to the meeting. A student volunteer room will be available at the headquarters hotel for checking assignments, networking with other students, and obtaining signatures for completed work.

Volunteer positions are based on need, and most are for four hours. Students who volunteer for four hours will be reimbursed half the student registration fee. Those who are assigned to eight hours of volunteer work will receive a reimbursement of the full student registration fee. Refunds are processed after the meeting.

## INSIDE HFES

# Call for 2012 Student Member and Chapter Award Applications

*by Kim-Phuong L. Vu, Chair, Student Affairs Committee*

The Student Affairs Committee is pleased to have the opportunity to recognize the accomplishments of and service to the Society by our students and student chapters through the Student Member with Honors Award and the Outstanding Student Chapter Award. To apply for these awards, students or chapters must send a completed application (see below) and supporting materials to me at [kim.vu@csulb.edu](mailto:kim.vu@csulb.edu) on or before **July 2, 2012**. Award recipients will be recognized at the 56th Annual Meeting (<http://www.hfes.org/web/HFESMeetings/2012annualmeeting.html>) in Boston during the Student Reception, to be held on Tuesday, October 23, from 5:00 to 6:00 p.m.

The following are eligibility requirements highlights for the awards. Please refer to the HFES Student Chapter Web site ([http://www.hfes.org/web/Chapters/student\\_chapters.html](http://www.hfes.org/web/Chapters/student_chapters.html)) for complete details.

### Student Member With Honors

This designation honors students who have made outstanding contributions to the discipline and/or HFES during their tenure as students. To qualify, students must meet *all* of the following eligibility requirements:

- Student membership in HFES for at least six months prior to application
- Classified as a graduate student, or class standing of junior or senior for an undergraduate
- Minimum GPA of 3.75 for graduate students; minimum GPA of 3.50 for undergraduate students
- Successful completion of at least three HF/E-related courses with an A grade
- Significant HF/E-related service to HFES
- One letter of recommendation from a faculty member specifying and demonstrating the student's outstanding contributions.

In addition, at least two of the following three conditions must be met:

- Primary author of an HF/E research paper published in an approved journal
- Presenter of an HF/E-related lecture at a national or international conference
- Evidence of significant contribution to an industry project

### **Student Chapter Levels of Recognition**

Chapters are recognized for their contributions and achievements (both the number and quality of activities) across a number of categories as listed below, with emphasis on demonstrated excellence in a specified number of areas. The levels of recognition are as follows:

- **GOLD** requires activity in at least eight categories with excellence in at least five categories, and at least 50% of the student members being HFES Student Affiliate members.
- **SILVER** requires activity in at least five categories with excellence in at least three categories, and at least 40% of the student members being HFES Student Affiliate members.
- **BRONZE** requires activity in at least three categories with excellence in at least two categories, and at least 25% of the student members being HFES Student Affiliate members.

The list of activity categories follows; of primary importance is the quality and outcome of the activity in the category. The creativity category allows chapters to uniquely define activities and provides an opportunity for some chapters to obtain a recognition level for which they would not otherwise qualify.

- Recruitment
- Guest speakers
- Field trips
- Outreach/volunteerism
- Collaboration
- Service to HFES
- Exploration
- Social and networking activities
- Information dissemination
- Mentorship
- Continuous improvement
- Creativity

Chapters must clearly indicate the recognition level sought (Gold, Silver, or Bronze), provide supporting materials that document the various activities of the chapter in each category, and provide a letter of recommendation from the chapter adviser. We encourage chapters to submit other materials that will support the application, such as brochures, announcements, or images from events, videos, and Web sites. Please include all supporting material electronically as part of the application, and provide a short narrative that sufficiently details your accomplishments in each activity category.

### **Submitting Your Application**

The deadline for receiving applications for both the Student Member with Honors and the Student Chapter Award is **July 2, 2012**. No applications will be accepted after this date. Be sure to read the complete application details before making your submission. Compile the completed application materials into a single document (preferably PDF, but Word is acceptable) and send it by e-mail to me at [kim.vu@csulb.edu](mailto:kim.vu@csulb.edu).

## **Gavan Lintern Presents April 23 Webinar on Why Systems Work**

Registration is now open for the April 23 webinar, “**Why Systems Work**,” presented by Gavan Lintern of Cognitive Systems Design. Members can register online at <https://www2.gotomeeting.com/register/967716994>. The webinar will be held at the following times:



12:00 noon–1:30 p.m. Pacific  
1:00–2:30 p.m. Mountain  
2:00–3:30 p.m. Central  
3:00–4:30 p.m. Eastern  
8:00–9:30 p.m. GMT

HFES webinars are free for members. Nonmember registration is available for \$125, and nonmember student registration is available for \$40. Both nonmember groups can register at <https://www.hfes.org/Web/EventDetails.aspx?EventID=18>. Please bookmark and check the HFES Webinars home page (<https://www.hfes.org/Web/Webinars/WebinarsMain.html>) for updates on this and future 2012 webinars!

### **About the Webinar**

According to Lintern, today's political, social, and cultural environments are heavily influenced by a technological imperative that asserts that any problems people face in the design and operation of complex sociotechnical systems can be resolved by developing new technological solutions. The technologically oriented are prone to argue that people create problems and that system designers should therefore limit the human role and maximize technological capability.

In this webinar, Lintern will argue that this sort of thinking is misguided, that it is the humans in a system who make it work, and that the *socio* in *sociotechnical* needs to be accorded a dominant status in technological development. He will focus on one aspect of this problem: the need to take full account of cognitive work in the acquisition and design of modern sociotechnical systems. He will also touch on the nature of systems that do cognitive work, technological myths that currently guide the design of the human-related aspects of modern sociotechnical systems, technological realities that should guide such design, the nature of a robust cognitive system, and the basic strategy for designing a robust cognitive system.

### **About the Presenter**

Gavan Lintern earned a PhD in engineering psychology from the University of Illinois in 1978 and MA and BA degrees in experimental psychology from the University of Melbourne, Australia, in 1971 and 1969, respectively. He has worked in aviation-related human factors research at the Defence Science and Technology Organisation (DSTO), Melbourne, and in flight simulation research on a U.S. Navy program in Orlando, Florida. He returned to the University of Illinois in 1985 to serve as a faculty member at the Institute of Aviation until 1997. He has subsequently held positions as head of human factors at DSTO in Melbourne; senior scientist with Aptima, Inc., in Boston; and chief scientist with General Dynamics Advanced Information Systems in Dayton, Ohio.

Lintern's primary expertise areas are in cognitive analysis and the design of complex knowledge and information systems, instructional system development for aviation and information-intensive systems, and e-learning development of professional and technical courseware. He has high-level skills in cognitive work analysis, functional interface design, Brahms human workflow modeling, and Web design.

## **List Your Consulting and Expert Witness Services With HFES**

If you're a Full Member or Fellow and provide consulting or expert witness services, HFES invites you to purchase a listing in the online Consultants Directory (<http://www.hfes.org/web/ConsultDirectory/Consultdirectory.aspx>).

The Consultants Directory is freely available to anyone who visits the HFES Web site. The fees for an annual listing are \$150 for individuals and \$250 for companies; listing renewal rates are \$100 for individuals and \$200 for companies.

If you are a current HFES member and you'd like to place or renew a listing, go to <http://www.hfes.org>, log in, and select the option "Create a Consultant Directory listing" on the Welcome page. If you have any questions, please contact the Member Services Department at 310/394-1811, [membership@hfes.org](mailto:membership@hfes.org).

## HFES Online Graduate Directory Update

Did you know that students make up about 15% of the overall HFES membership? Students are critical to the current and future vitality of the Society and the human factors/ergonomics profession. To continue fostering this special relationship, HFES provides a number of free resources for students, in addition to regular membership benefits (complimentary subscriptions, discounts on other publications and annual meeting registration fees, and free résumé posting). One of these resources is the online Directory of Human Factors/Ergonomics Graduate Programs in the United States and Canada.

The online graduate directory assists prospective graduate students with information to make a preliminary selection of graduate programs for further consideration.

If you have a graduate program listing in the directory, or one you'd like to list, please provide entries and updates to HFES Managing Editor Cameron Wile ([cameron@hfes.org](mailto:cameron@hfes.org)). To submit a new program for consideration, download the listing form (Word document) from [http://www.hfes.org/web/Students/grad\\_programs.html](http://www.hfes.org/web/Students/grad_programs.html). Updates will be completed in the spring, in the order received.

## Member Milestones: Harold P. Van Cott



"With each advance in technology, the human has become the increasingly weak link in systems," wrote Harold ("Van") P. Van Cott in 2001. The prominent behavioral scientist, formerly of Bethesda, Maryland, died February 3, 2012, in the Pittsburgh area. He was 86.

Van Cott came from a Dutch-American family with roots in New York since 1662. Born and raised in Schenectady, New York, he served in the U.S. Army in World War II. Under the G.I. Bill, he completed a BA degree in physiological psychology at the University of Rochester in 1948 and went on to earn an MA in social psychology in 1952 and a PhD in psychological science in 1954, both from the University of North Carolina in Chapel Hill.

Over a 40-year career, Van Cott specialized in behavioral analysis and the interactions between people and technology. He was a pioneer in the then-emerging field of HF/E, particularly the study of human error and its causes and prevention. His areas of expertise and experience included such diverse topics as the design of nuclear power plants, human interface with military vehicles, medical errors, transportation safety, organizational performance, workplace injuries, and consumer product safety.

He held a number of prestigious positions, including principal staff officer at the National Research Council of the National Academy of Sciences, manager of Human Factors with IBM Federal Systems, director of the Institute for Human Performance with the American Institutes for Research, manager of Publications and Communications of the American Psychological Association, and director of Consumer Sciences Research at the National Institutes of Standards and Technology. In the 1980s, Van Cott also served as chief scientist at Biotechnology, Inc., of Falls Church, Virginia, and as a vice president at Essex



Corp. of Alexandria, Virginia. Throughout the 1990s, he worked as an independent consultant for a wide variety of government agencies, research laboratories, and private industries. He testified before the U.S. Senate Appropriations Committee in 1998 regarding highway safety.

A prolific writer in his field, Van Cott authored 10 book chapters and more than 150 journal articles and technical reports. He was editor of the widely used *Human Engineering Guide to Equipment Design*, sponsored by the Department of Defense. He held the positions of Fellow and president of both the Human Factors and Ergonomics Society and Division 21 of the American Psychological Association. He was also a Fellow in the American Psychological Society, the American Association for the Advancement of Science, and the Washington Academy of Sciences. Van Cott was a member of the American Associations of Engineering Societies' Board of Governors, the Board of Directors of Oxford Research Institute, the Society of Sigma XI, and the Cosmos Club.

During a brief period when he taught psychology at Alfred University in New York, Van Cott met Madeleine P. Bouvier, a Fulbright scholar from Paris studying ceramic engineering. They married in 1952. Van Cott is survived by Madeleine, son Laurent Van Cott, daughters Jeanne Marie Van Cott and Anne Van Cott, son-in-law Mike Usman, and grandchildren Nicholas Usman and Samantha Usman.

## CALENDAR

### April 2012

EHF2012, April 16-19, Blackpool, UK, <http://www.ehf2012.org.uk>.

PREDICTING PERCEPTIONS: The 3rd International Conference on Appearance Edinburgh, April 17-19, Edinburgh, Scotland, [www.perceptions.macs.hw.ac.uk](http://www.perceptions.macs.hw.ac.uk).

### May 2012



2012 Industrial and Systems Engineering Research Conference, May 19-23, Hilton Bonnet Creek, Orlando, Florida, [www.iienet.org/annual](http://www.iienet.org/annual).

### June 2012

XXIVth Annual International Occupational Ergonomics and Safety Conference, June 7-8, Ft. Lauderdale, Florida, <http://isoes.info/conference.htm>.

18th International Conference on Auditory Display (ICAD2012), June 18-22, Atlanta, Georgia, <http://icad2012.icad.org>.

COLLA 2012, The Second International Conference on Advanced Collaborative Networks, Systems and Applications, June 24-29, Venice, Italy, <http://www.iaria.org/conferences2012/COLLA12.html>.

 
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