



AAR-100

Human Factors Newsletter # 04-17

August 21, 2004 – September 3, 2004

Technical Note: Human factors research grant awarded to the University of Texas at Austin (Principal Investigator – Dr. Bob Helmreich): Advancing Aviation Safety: Threats, Errors, and their Management in Normal Operations

The University of Texas human factors research project has conducted aviation research for more than 25 years. Work in the last five years has focused on development of Line Operations Safety Audits (LOSA), a methodology for monitoring and diagnosing normal flight operations. Premised on the concepts of Threat and Error Management (TEM), LOSA data includes information such as city pairs, aircraft type, crew demographics, crew performance ratings across phases of flight, a flight narrative, and threat and error data. A cockpit observer logs all threats and errors, and for each instance, he or she notes if, when, and how it was detected, the crew's response, and the outcome (inconsequential, additional error, or undesired aircraft state). Researchers now have access to data collected in 19 LOSAs – a total of 3,300 observations across 16 different airlines. These data are stored in the LOSA Archive.

The overall aim of this new research is to promote the use of the TEM model throughout the airline industry. To do that, the research team recognizes the need to clarify the model and locate it in the broader safety landscape of existing applications and tools. Having done that, it is their intention to make TEM and LOSA as accessible as possible to large and small air carriers, as well as other interested sectors of the industry and aviation community, including air traffic control. Concurrent with these activities, data-mining of the LOSA archive will begin, starting with general industry statistics of threats, errors, and their management, and progressing to more specific issues such as unstable approaches and intentional noncompliance. Believing that TEM can provide a common framework across different safety tools, researchers also plan to develop a proof of concept that LOSA and ASAP, using TEM as a common metric, can be integrated to maximize the safety lessons learned.

Point of Contact: E. Edens, AFS-230

Human Factors Presentation: Pam Della Rocco, Gulshan Panjwani and Anton Koros will attend the Human Factors and Ergonomics Society 48th Annual Meeting in New Orleans,

September 20-24, 2004. Mr. Panjwani will present a paper titled “A Unified Complexity Framework for Air Traffic Control: Needs and Implications”.

Abstract: Air Traffic Control (ATC) is a complex task with serious safety implications. Accordingly, research has focused on the sources underlying this complexity, particularly in the en route environment. There has been no attempt to form a cohesive framework that explains complexity across ATC domains. With the introduction of Free Flight and other concepts of shared separation, the restrictions inherent in the terminal environment necessitate the inclusion of this domain into a single cohesive model. Researchers from the FAA Technical Center conducted a field study of the sources of complexity and information needs in the ATC tower. The researchers compared the results with previously documented research from the en route environment. The complexity sources and controller information requirements demonstrated parallels across ATC domains. This merits an effort to form a framework of controller information needs and complexity sources. The authors discuss the implications of such a framework for future automation.

Dr Tanya Yuditsky, Mr. Bart Brickman (Northrup Grumman), and Gulshan Panjwani (Titan Systems) will also attend the meeting. Dr Yuditsky will present a paper written by Ferne Friedman-Berg, Titan Systems Corporation, Tanya Yuditsky, & Alfred Smith, titled “Developing Human Factors Design Principles for Information Display Systems in Air Traffic Control”.

Abstract: An Information Display System (IDS) provides access to many types of information. It consolidates data to one source and eliminates the need for multiple displays. An IDS provides a logical structure and uses a standardized information display format. Researchers present a set of design principles for IDSs in Air Traffic Control (ATC). They conducted an investigation of information and usability requirements in each of the ATC domains. Based on the investigation, principles were developed that capture the critical components of designing an effective IDS for ATC. In order to be useful and usable, an IDS and the information it contains should be accessible, current, comprehensive, and standardized. Included is a discussion of each principle, the motivation for including them, and some specific examples of how they can be implemented in an IDS. Researchers also discuss the methods used for collecting data from the field, refining and validating the principles.

Point of Contact: D. Piccione, ATOP-R&D

ATC Workforce: Dana Broach (AAM-520) traveled to Washington, DC to meet with the ATO Comprehensive ATCS Workforce Planning core team on September 1 & 2. The team is developing a plan required by Public Law 108-176, Section 221 that will describe (a) where and when losses of current controllers are expected due to retirements and other attrition, and (b) the processes by which the agency will hire, train, and assign new controllers. The plan will be briefed on a chapter-by-chapter basis to the Administrator on September 9th. (D. Broach, CAMI)

Human Performance: Dr. Esa Rantanen, an FAA grant researcher from the University of Illinois at Urbana-Champaign, visited the William J. Hughes Technical Center’s National Airspace System Human Factors Group for data collection on a simulated air traffic control task. This was the first in a series of several scheduled visits. Dr. Rantanen is conducting the

experimentation in support of Air Traffic Control human performance modeling. (E. Stein, WJHTC)

HFACS: Scott Shappell presented findings from the Civil Aerospace Medical Institute's analysis of general aviation, commercial aviation, and military aviation accidents using the Human Factors Analysis and Classification System (HFACS) at the annual meeting of the International Society of Air Safety Investigators in Gold Coast, Australia. HFACS is a general human error framework for investigating and analyzing the human causes of aviation accidents. It addresses human error at all levels of the system, including the condition of the aircrew and organizational factors. (D. Schroeder, CAMI)

CAASD: Dino Piccione (Human Factors Research and Engineering Division), Mike McAnulty (William J. Hughes Technical Center's National Airspace System Human Factors Group), Carol Manning and Larry Bailey (Civil Aeromedical Research Institute), and others participated in a Technical Information Meeting hosted by MITRE/Center for Advanced Aviation System Development (CAASD). This meeting was a follow-on to the FAA/NASA Interagency ATM Integrated Product Team (IAIPT) human factors meeting held in July at the Technical Center. MITRE representatives presented an overview of the CAASD program along with information particular to their en route and traffic flow management (TFM) research. The briefing included general information about integrating the User Request Evaluation Tool with problem analysis, resolution and ranking, and controller-pilot data link communication. There was also discussion of controller training practices and area resource management as well as work on TFM including the Collaborative Routing Coordination Tools, impact assessment, and probabilistic TFM. (D. Piccione, ATOP-R&D)

JANUS: In concert with ATO-S, a candidate set of air traffic control towers has been identified for inclusion in the JANUS "go-to" program wherein a CAMI researcher visits the facility and facilitates the JANUS operational error analysis. The in-briefs for these towers started in July. A team representing FAA management, NATCA, and CAMI will visit seven additional facilities to provide information and answer questions about the program. Candidate facilities will then determine whether they will volunteer to participate in this effort. (J. Pounds, CAMI)

Laboratory Visit: Ben Willems met with two researchers from the Army Research Laboratory (ARL) and one of their research partners from Brigham Young University during a visit with the William J. Hughes Technical Center's National Airspace System (NAS) Human Factors Group. Discussion topics included mutual research interests, multi-tasking related cognitive load, and the parallels between air traffic control and human robot interaction. There was also a presentation of ARL research on the operation of unmanned ground vehicles. The visit was part of an exchange of information between the NAS Human Factors Group and their ARL counterparts. (E. Stein, WJHTC)

REDAC: Human factors program managers and researchers met with the REDAC Human Factors Subcommittee in FAA Headquarters to review and discuss the human factors research program in terms of content and resources. Presentations and dialog also addressed human factors issues and challenges in Communication, Navigation & Surveillance/Air Traffic

Management air-ground integration as part of National Airspace System modernization. Additionally, the role of human factors in safety management and oversight was discussed. (T. McCloy, ATOP-R&D)

Technical Operations Standardization Team: Tanya Yuditsky from the William J. Hughes Technical Center's National Airspace System Human Factors Group participated in a kickoff meeting for a Technical Operations Standardization Team. This team will be a resource to user teams and program offices in all domains for information on existing and ongoing research and development in the technical operations area. Included was a briefing on the importance of human factors in design, a discussion of the current differences in monitor and control interface designs, and a review of research requirements for the future. (E. Stein, WJHTC)

Electronic Flight Bag (EFB): Dr. Divya Chandra of the Volpe Center presented workshops on her EFB research to the Federal Aviation Administration (FAA) and industry August 25-26 in Washington, DC. In the workshops, she provided background on EFB human factors issues and described the products of the Volpe research. These products include a resource document and evaluation tools that can aid system developers, operators, and regulators in evaluating EFBs from a human factors perspective. Attendees were also given a chance to practice evaluating an EFB software application using one of the Volpe EFB usability-assessment tools. The first workshop was given as a part of the FAA Flight Standards Workshop on New Technologies. EFBs were one of the featured technologies at the conference, which had approximately 475 attendees and 30 exhibitors. The audience consisted of EFB manufacturers, government agencies, US Air Force Flight Standards Agency, and NavCanada. The second workshop was given to a select group of FAA Flight Standards field staff who may become involved in approving EFBs. Approximately 25 individuals attended each of the two workshops, which were conducted at the request of the FAA Flight Standards Service.

An information paper on Volpe EFB research to develop EFB usability-assessment tools will be presented by the FAA to the International Civil Aviation Organization (ICAO) at a September 2004 meeting of the Operations Panel in Montreal, Canada. The brief information paper was based on a conference paper on this effort that will be presented at HCI (Human-Computer Interaction) Aero in Toulouse in late September. (D. Chandra, Volpe NTSC; T. McCloy, ATOP-R&D)

Weather: Researcher Ulf Ahlstrom from the William J. Hughes Technical Center's NAS Human Factors Group is working to complete a human-in-the-loop simulation at the Research Development and Human Factors Laboratory. During this six-week simulation, which started in August, twelve Terminal Radar Control controllers from Automated Terminal Radar Systems (ARTS) II, ARTS III, and Standard Terminal Automation Replacement System facilities across the US will participate in an evaluation of weather information needs for terminal controllers. Using pre-recorded Integrated Terminal Weather System weather data, researchers will evaluate the potential benefits and problems associated with presenting advanced weather information at the controller workstation. (E. Stein, WJHTC)

ETMS: Tanya Yuditsky from the William J. Hughes Technical Center's National Airspace System Human Factors Group will meet with the Traffic Management User Team and with

software engineers from the Volpe Center to finalize requirements for an upcoming release of the Enhanced Traffic Management System (ETMS). During the meeting, she will present results of an analysis of filter use in the creation of Flow Constrained Areas in ETMS and a design proposal based on the findings. The Team will review design proposals for the display of the Collaborative Convective Forecast Product. (E. Stein, WJHTC)

Call for Nominations for Excellence in Technology Transfer: The Federal Laboratory Consortium (FLC) for Technology Transfer is now accepting nominations for the 2005 Award for Excellence in Technology Transfer. This award recognizes laboratory employees who have accomplished outstanding work in the process of transferring a technology developed by a federal laboratory. Nominations are made by FLC laboratory representatives and judged by representatives from industry, state and local government, academia, and federal laboratories. Simply being nominated is in itself a high honor. Only FLC laboratory representatives may nominate recipients for these awards. FLC laboratory or agency representatives are not eligible to be nominated---nor may they nominate their immediate supervisor. All other laboratory staff are eligible to be nominated. A nomination package is available at <http://ack.tc.faa.gov/ackwhatsnew.html>. If you have any questions about the FLC Awards Program or with the nominations package, please contact Deborah Germak, Technology Transfer Program Manager, at (609) 485-9862, or via e-mail at Deborah.germak@faa.gov. Please submit all nominations to Deborah Germak no later than Friday, October 1, 2004.

More information on human factors research can be found at the FAA Human Factors (AAR-100) web site: <http://www.hf.faa.gov>

Mark D. Rodgers
FAA (ATOP-R&D)



September 5-9, 2004 - [52nd International Academy of Aviation and Space Medicine](#)
Sun City, South Africa

September 8-9, 2004 – Civil Aviation Safety Symposium 2004, Westin Hotel Galleria, Dallas, TX <http://www.asdnet.org/cass/default.htm>

September 14-16, 2004 – Airbus Human Factors Symposium, New Delhi, India
<http://www.airbus.com/customer/events.asp>

September 14-17, 2004 – 22nd International Air Cargo Forum and Exposition, Basque Country, Spain <http://www.tiaca.org>

September 14-17, 2004 – National Cargo Security Council 2004 Conference & Exhibition, Riviera Hotel & Casino, Las Vegas, NV <http://www.cargosecurity.com>

September 16, 2004 – Aircraft Lighting Meeting, Nashville, TN elizd@sae.org

September 19-20, 2004 – Association for the Advancement of Medical Instrumentation AAMI/HE Human Factors Engineering Committee Meeting, New Orleans, LA
ntongson@aami.org

September 20, 2004 – Nondestructive Methods and Processes Committee Meeting, Albuquerque, NM kerrir@sae.org

September 20-22, 2004 [AIAA 1st Intelligent Systems Technical Conference](#) Hilton Chicago, Chicago, IL

September 20-22, 2004 - [AIAA 4th Aviation Technology, Integration and Operations \(ATIO\) Forum](#) Hilton Chicago, Chicago, IL

September 20-23, 2004 - [AIAA 3rd "Unmanned Unlimited" Technical Conference, Workshop and Exhibit](#) Hilton Chicago, Chicago, IL

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

September 27-29, 2004 – SAFE Association 42nd Annual Symposium, Grand America Hotel, Salt Lake City, UT <http://www.safeassociation.com/symposium.htm>

September 28 – October 8, 2004 – ICAO Assembly 35th Session, Montreal, Canada
<http://www.icao.int/icao/en/assembl/a35/index.html>

September 28-30, 2004 - Seventh GAIN World Conference (Global Aviation Information Network), Montreal, Canada. <http://www.gainweb.org>.

September 29 – October 1, 2004 – 2004 International Conference on Human Computer Interaction (HCI-Aero), Toulouse, France
<http://www.eurisco-international.com/hci-aero2004>.

September 29-October 4, 2004 – Aviation North Expo, Fairbanks, AK meadow@acsalaska.net
www.AviationNorth.org

October 4-7, 2004 – SAE SEAT – Aircraft Seat Committee Meeting, Albuquerque, NM
mlemank@sae.org

October 5-7, 2004 – Aircraft Seat Committee Meeting, Albuquerque, NM
mlemank@sae.org

October 10-16, 2004 – ACM Multi-Media 2004, New York, NY <http://www.mm2004.org/>

October 11-14, 2004 – User Interface 9 Conference, Cambridge, MA uiconf@uie.com.

October 12-14, 2004 – Shared Vision of Aviation Safety Conference, San Diego, CA
<http://www.aviationsafetyconference.com/index2.html>

October 12-14, 2004 – 57th Annual Business Aviation Association Meeting and Convention, Las Vegas County Convention Center, Las Vegas, NV <http://web.nbaa.org/public/cs/amc/>

October 13-15, 2004 – Sixth International Conference on Multimodal Interfaces, Penn State University, State College, PA <http://www.icmiplace.org/>

October 18-19, 2004 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, DC <http://wwwsearch.nationalacademies.org/>

October 18-20, 2004 – Human Factors in Aeronautics Symposium, NASA-Ames Conference Center, Moffett Field, CA richard.h.mogford@nasa.gov

October 18-22, 2004 – AC-9 Aircraft Environmental Systems Meeting, Wichita, KS
mlemank@sae.org

October 19-20, 2004 – Aerospace Council Meeting, Toulouse, France
mlemank@sae.org

October 21-23, 2004 – Aircraft Owners and Pilots Association Expo 2004, Long Beach Convention and Entertainment Center, Long Beach, CA <http://www.aopa.org/expo/2003/virtual/>

October 23-27, 2004 – NordiCHI 2004, Tampere, Finland <http://www.cs.uta.fi/nordichi2004/>

October 24-27, 2004 – UIST 2004, 17th Annual ACM Symposium on User Interface Software and Technology, Santa Fe, NM <http://www.acm.org/uist/>

October 25-28, 2004 - [7th Annual Systems Engineering Conference](#) Dallas Marriott Quorum, Dallas, TX

October 25-28, 2004 – SAE S-9 Cabin Safety Technical Committee Meeting, San Diego, CA
mlemank@sae.org

October 25-28, 2004 – DoD Maintenance Seminar and Exhibition, Hilton Americas, Houston, TX <http://www.sae.org/calendar/aeromtgs.htm>

October 26-28, 2004 – ICAO Security Seminar, Merida, Mexico <http://www.icao.org>

October 27-29, 2004 – Human Factors and Ergonomics Society Europe Chapter Annual Meeting, Delft University, the Netherlands
http://utopia.ision.nl/users/hfesec/meeting/ec_meet.htm

October 27-29, 2004 – S-9 Cabin Safety Technical Committee Meeting, San Diego, CA
mlemank@sae.org

October 31, 2004 – ATCA Annual Conference and Exposition, Marriott Wardman Park Hotel, Wash., DC http://www.atca.org/event_items.asp#

November 1-4, 2004 – DOD Human Factors Engineering Technical Advisory Group Meeting, Holiday Inn Select, Alexandria, VA <http://hfetag.dtic.mil/meetschl.html>

November 2-4, 2004 – World Aviation Conference, Hilton Hotel, Reno, NV
<http://www.sae.org/events/wac/>

November 3-4, 2004 - Second ICAO-IATA LOSA & TEM Conference, Seattle, Wash
dmaurino@icao.int , curt.graeber@boeing.com

November 4-5, 2004 – Royal Aeronautical Society Seminar - Human Factors Training in Aviation Maintenance, RAF Bentley Priory, Stanmore, near Watford, North London
<http://www.raes-hfg.com/xmhftraining.htm>

November 7-9, 2004 – *Aviation Maintenance Software Technology & Resource Symposium*, *Pointe South Mountain Resort, Phoenix, AZ* <http://www.STARSymposium.com>

November 8-9, 2004 – European Aviation Training Symposium, Vienna, [Austria](#)
<http://www.at-events.com/eats/conference.asp>

November 8-10, 2004 – *Aerospace Testing Expo 2005 Scientific Conference and Technology Forum*, *Long Beach Convention Center, Long Beach, CA* <http://www.aerospacetesting-expo.com/northamerica/conf+forum.html>

November 12-17, 2004 – American Society for Information Science and Technology Annual Meeting, Providence, RI asis@asis.org

November 13-14, 2004 – *Aviation Nation*, *Nellis AFB, NV* www.nellisairshow.com

November 15-18, 2004 – 57th Annual International Air Safety Seminar (“Sharing Knowledge to Improve Safety”), Pudong Shangri-La Hotel, Shanghai, China
<http://www.flightsafety.org/seminars.html>

November 15-18, 2004 – Fire and Cabin Safety Research Conference, Lisbon, Portugal
www.caa.co.uk/srg/intsd/event.asp?groupid=73

November 16, 2004 - FY04 General Aviation, Vertical Flight, and Aviation Maintenance Human Factors Program Review, FAA Headquarters Bessie Coleman Training Center, Wash, DC <mailto:william.krebs@faa.gov>.

November 18-19, 2004 – IT World Expo, Toronto, Canada richardp@WowGao.com

November 18-21, 2004 – 45th Annual Meeting of the Psychonomic Society, Hyatt Regency and Millenium Hotels, Minneapolis, MN [45th Annual Meeting of the Psychonomic Society](#)

January 9-12, 2005 – International Conference on Intelligent User Interfaces, San Diego, CA <http://www.catamaranresort.com/>

January 9-13, 2005 – TRB 84th Annual Meeting, Washington, DC <http://trb.org/calendar/>

January 10-13, 2005 - 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/>

January 25-27, 2005 – AE-2 Aerospace Lighting Committee Meeting, New Orleans, LA elizd@sae.org

January 28, 2005 – Deadline for papers - 6th USA/Europe ATM Seminar, Baltimore, MD, June 2005 <http://atmseminar.eurocontrol.fr/>

April 2-7, 2005 – CHI 2005, Portland, OR chi2005-chair@acm.org.

April 11-15, 2005 – SAE 100th Anniversary World Congress, Cobo Hall, Detroit, MI <http://www.sae.org/congress/about/news/congressdates.htm>

April 17-22, 2005 – International Federation of Air Traffic Controller's Associations, Melbourne, Australia http://www.ifatca.org/conferences/annual_conference.htm

April 18-21, 2005 – 13th International Symposium on Aviation Psychology (ISAP), Civil Aerospace Medical Institute (CAMI), Oklahoma City, OK (note: call for papers deadline is August 16, 2004). <http://www.cami.jccbi.gov/>, <http://www.wright.edu/isap/>

May 9-12, 2005 - 76th Annual Scientific Meeting of the Aerospace Medical Association, Kansas City, MO <http://www.asma.org/>

June 2005 – 6th USA/Europe ATM Seminar, Baltimore, MD (note: call for papers deadline is January 28, 2005) <http://atmseminar.eurocontrol.fr/>

July 22-28, 2005 – HCI International 2005, 11th International Conference on Human-Computer Interaction, Caesars Palace, Las Vegas, NV hci2005@ecn.purdue.edu

August 15-18, 2005 - 43rd AIAA Aerospace Sciences Meeting and Exhibit, Hyatt Regency San Francisco at Embarcadero Center, San Francisco, CA <http://www.aiaa.org/>

August 18-21, 2005 - 113th Convention of the American Psychological Association, Wash, DC <http://www.apa.org/convention>

September 12-16, 2005 – Interact 2005, Tenth IFIP TC13 International Conference on Human-Computer Interaction, Rome, Italy <http://www.interact2005.org/>

September 25-28, 2005 - 11th Ka and Broadband Communications Conference and 23rd AIAA International Communications Satellite Systems Conference 2005 (organized by IIC), Aurelia Convention Center, Rome, Italy <http://www.aiaa.org/>

September 26-28, 2005 - AIAA 5th Aviation, Technology, Integration, and Operations Forum (ATIO), Hyatt Regency Crystal City, Arlington, VA <http://www.aiaa.org/>

September 26-28, 2005 - AIAA 2nd Intelligent Systems Conference (IS), Hyatt Regency Crystal City, Arlington, VA <http://www.aiaa.org/>

September 26-30, 2005 – Human Factors and Ergonomics Society 49th Annual Meeting, Royal Pacific Resort at Universal Orlando, Orlando, FL <http://hfes.org/meetings/menu.html>

October 3-6, 2005 – SAE 2005 AeroTech Congress and Exhibition, Gaylord Texan Resort and Convention Center, Dallas/Fort Worth Airport Area, Texas
<http://www.sae.org/events/conferences/aerospace/>

October 24-25, 2005 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, *DC* <http://wwwsearch.nationalacademies.org/>

January 9-12, 2006 - 44th AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/>

January 22-26, 2006 – TRB 85th Annual Meeting, Washington, DC <http://trb.org/calendar/>

Note: Calendar events in Italics are new since the last Newsletter



Comments or questions regarding this newsletter?
Please contact Bill Berger at (334) 271-2928
or via e-mail at bill.ctr.berger@faa.gov

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