AAR-100

Human Factors Newsletter # 01-05

(February 24, 2001 – March 9, 2001)

AT/AF Maintenance Scheduling Coordination: Researchers from the William J. Hughes Technical Center (ACT-530) mailed 600 surveys to Airway Facilities (AF) Maintenance Control Center specialists and Air Traffic (AT) supervisors. This is part of a program studying maintenance scheduling coordination between AF and AT. One of the major focuses in modernizing the NAS is facilitating "information services for collaboration and information sharing." AF specialists have been coordinating with AT and other organizations in the past for maintenance tasks. However, there has been no empirical analysis of these relationships. The new study will specifically address various aspects of current coordination such as information sharing, timely notices and responses to requests, communication methods, and empowering between organizations. (S. Hah, WJHTC)

SABET: The Study of an ATC Baseline for the Evaluation of Team Configurations (SABET) completed its fourth successful week of operations, with data gathered on 12 participants. A total of 30 participants are planned. SABET started in January 2001 and will end in March 2001. (E. Stein, WJHTC).

Electronic Flight Bag (EFB): A researcher and manager from Volpe NTSC will attend a meeting of the Air Transport Association Digital Data Working Group in Melbourne, FL on 13 March. The researcher will present an update on Volpe activities in support of the FAA's request for guidance on assessing the human factors issues related to EFBs. For this meeting, the focus will be on issues related to electronic display of aeronautical charts. The industry feedback that she obtains will be incorporated into an updated document on human factors considerations for EFBs. (D. Chandra, VNTSC, T. McCloy, AAR-100)

Detail: Ron Simmons/AAR-100 has accepted a detail to the STARS Team to develop a knowledge management program to support business process and team collaboration. Ron will be working directly for the lead of STARS, Alan Fienberg. The detail is for one year with a one year option. (B. Berger, AAR-100)

Call for Nominations for Fifth Annual FAA Excellence in Aviation Award: The Federal Aviation Administration (FAA) has issued a call for nominations for its Excellence in Aviation

Award. Through this award, the FAA formally recognizes significant accomplishments as a result of aviation-related research efforts. This special distinction is intended to augment the ability of the government to recognize superior research efforts and to highlight the benefits of such activities. The Excellence in Aviation designation is a highly competitive, non-monetary award that is presented annually to individuals and/or institutions following an evaluation of documentation which clearly shows how past research benefits the aviation community today. Nominees must be able to show significant impact and benefit of extended aviation research efforts and application of improvements within the aviation industry. This is the fifth year that the agency will be presenting this prestigious award. Each year the nominee pool has grown, reflecting a broad spectrum of aviation-related research activities. Nominations and supporting documentation for the 2001 Excellence in Aviation Award will be accepted through April 30, 2001. The nomination form can be found on the FAA's Office of Aviation Research website at: http://research.faa.gov/aar. For additional information on the Excellence in Aviation Award, please contact Ms. Denise Davis, FAA's Office of Aviation Research, at (202) 267-9426 or by email at denise.davis@faa.gov (T. Kraus, ACP-8)

Ohio State University Aviation Psychology Symposium:

- Staff from the Office of the Chief Scientist for Human Factors (AAR-100) gave two presentations at the Symposium held in Columbus, Ohio. One paper, which was co-authored with ASD staff, described results from a technical interchange meeting held last summer under the auspices of the Interagency Air Traffic Management Integrated Product Team (IAIPT) with NASA Ames. The paper addressed human factors issues related to acquisition programs involving automation and communication, navigation, and surveillance (CNS) technologies, and described findings associated with lessons learned, issues and challenges, and applying what has been learned. The second presentation was part of a panel discussion and addressed human factors research needs related to transitions in free flight. The international Symposium is conducted every other year, and was attended by over 500 individuals from academia, government, and industry. (P. Krois, AAR-100)

- Researchers from CAMI presented the following papers: *Pilot Decision-Making Using Advanced Cockpit Displays* which reported research on the effect of two highway-in-the-sky (HITS) displays and a separated perspective terrain display on pilot decision-making and flight performance (K. Williams); *Data Linked Pilot Reply Time on Controller Workload and Communication in a Simulated Terminal Option*. The paper presented the findings of a simulation study on how data-link reply time might affect controller workload and operational communications in an environment in which data-link and voice-radio replies were immediate (immediate condition), or immediate for voice-radio yet delayed about 11 seconds for data-link (mixed condition) (R. Prinzo); *A Preliminary Test of Two Models for Human Factors Analysis of Operational Errors*. This paper reports on one of a series of activities to harmonize two human factors techniques developed for retrospective investigation of human errors in aviation systems: the Human Factors Analysis and Classification System (HFACS) and the Human Error in ATM Technique (HERA). A comparison of the two techniques was conducted by having an air traffic control (ATC) subject matter expert (SME) analyze a common set of

incident reports using both. Results demonstrated that HFACS captured human factors at a categorical level, while HERA identified specific cognitive processes. Future work will build on the strengths of both techniques to create a retrospective method for investigation of human error in operational errors (J. Pounds, A. Isaac, EUROCONTROL); *Retrospective Human Factors Analysis of ATC Operational Errors*. This paper reports the results from retrospective analysis of separation violations reported as air traffic operational errors using a modified version of the Human Factors Analysis and Classification System (HFACS) which was modified for investigation of air traffic incidents (HFACS-ATC). Results showed that most causal factors were classified as failures at the individual level while few could be classified at the levels of supervision or organization. This distribution was, in part, attributed to the type of data available for the analysis (A. Scarborough, J. Pounds).

Other papers presented by CAMI representatives included:

Bailey, L. *An Examination of the Internal Consistency of the NASA Task Load Index (TLX) Ratings.*

Beringer, D. and Ball, J. *General Aviation Visual Performance Using Conformal and Non-Conformal Head-Up and Head-Down Highway-in-the-Sky Displays*.

Cruz, C., Sanders, B., Detwiler, C., and Nesthus, T. *Shiftwork in Air Traffic Control: A Comparison of Clockwise and Counterclockwise Rapidly Rotating Shifts. (Ed. Note. See article later in this Newsletter)*

Fiedler, E., Hawkins, M., and Harkey, J. *Contributing Factors to Unruly Passenger Behavior.*

Goldman, S., Fiedler, E., and Hawkins, M. *General Aviation Maintenance-Related Accidents: A Review of 10 Years of NTSB Data*.

Hawkins, M., Moore, J., Fiedler, E. *Age and Cog Screen Scores in Older Aviators.*

Heil, M. *The Relationship Between TLX Scores and Objective Measures of Air Traffic Control System Outcomes.*

Manning, C., Mills, S., Pfleiderer, E., Fox, C., and Mogilka, H. *Relationships Among Observer Ratings of Mental Workload and Task Load Measures Derived from Routinely Recorded Air Traffic Control Data*.

Pape, A., Wiegmann, D., and Shappell, S. *Air Traffic Control and Aviation Accidents: A Human Factors Analysis.*

Shappell, S. and Wiegmann, D. *Unraveling the Mystery of General Aviation Controlled Flight into Terrain Accidents using HFACS.*

Wiegmann, D. and Shappell, S. *Human Error Analysis of Commercial Aviation Accidents: Application of the Human Factors Analysis and Classification System (HFACS).*

In addition to the papers presented, many CAMI scientists chaired numerous sessions and presented a workshop to a sold-out audience on Human Factors Accident Investigation and Prevention (Shappell, S. and Wiegmann, D.).

- A researcher from the Volpe NTSC presented a paper by Longridge, Thomas, Bürki-Cohen, Judith, Go, Tiauw, Kendra, Andrew J. entitled *Simulator Fidelity Requirements for Today's Airline Pilot Training*. (J. Bürki-Cohen, VNTSC, E. Edens, AAR-100)

Realistic Radio Communications: On February 12th, Volpe NTSC researchers submitted a paper entitled *Air Traffic Control in Airline Pilot Simulator Training and Evaluation* by Judith Bürki-Cohen and Andrew J. Kendra to the Air Traffic Control Quarterly. (J. Bürki-Cohen, VNTSC, E. Edens, AAR-100)

Vertical Navigation Displays: The International Journal of Aviation Psychology published a paper entitled *Vertical Navigation Displays: Pilot Performance and Workload During Simulated Constant-Angle-of-Descent GPS Approaches* by Oman, Charles M., Kendra, Andrew J., Hayashi, Miwa, Stearns, Mary D., and Bürki-Cohen, Judith. See International Journal of Aviation Psychology, 11 (1), 15-31. (J.Bürki-Cohen, VNTSC, T. McCloy, AAR-100).

Flight Deck Technologies: A researcher from the Volpe NTSC participated in an SAE G-10 Subcommittee Vertical Situation Awareness Displays Group meeting at Melbourne FL. The group discussed the follow-up issues document to the nearly-completed Aerospace Recommended Practices document for vertical situation awareness display, dividing drafting work among the group members. He also interviewed Claudius La Burthe, flight test engineer for Airbus. Mr. La Burthe described the profile situation awareness display under development for the new Airbus A380. Contrary to earlier designs, the profile displays features only a track swath whose width is a function of the display range setting. Shading is used to indicate where the swath overlays the programmed flight path. (M. Zuschlag, VNTSC, T. McCloy, AAR-100)

Air Carrier Training: A researcher from the Volpe NTSC participated in an SAE G-10 Subcommittee Realistic Training Group meeting at Melbourne FL. The group discussed current and upcoming documents in many aspects of training, along with plans for the next World Aviation Conference. (M. Zuschlag, VNTSC, E. Edens, AAR-100)

Data Link: A CAMI scientist attended a meeting of the RTCA Special Committee 195, Minimum Aviation System Performance Standards (MASPS) for Flight Information Services – Broadcast (FIS-B) Data. The committee has completed version one of this document and is now making plans for the first revision. The upcoming revision will expand the number and types of FIS applications being supported. (K. Williams, CAMI)

A Laboratory Comparison of Clockwise and Counter-Clockwise Rapidly Rotating Shift Schedules: This CAMI study directly compared clockwise and counter-clockwise rapidly

rotating shiftwork schedules to test the hypothesis that the clockwise rotation would result in better vigilance performance. Participants (n=28) worked day shifts for the first week of the study (0800-1600) followed by two weeks of either a clockwise (n=14) or counter-clockwise (n=14) shiftwork schedule. Results of the Bakan vigilance task indicated that performance was dependent upon shift and rotation condition, with vigilance in the counter-clockwise rotation condition being better on the evening shifts and falling more sharply on the midnight shift, as compared with the clockwise rotation condition. (C. Cruz, C. Detwiler, B. Sanders, T. Nesthus, CAMI)

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 (AAR-100)

CALENDAR

March 13-15, 2001 – The Advanced Technology Electronic Defense Systems Conference and The Tactical Situational Awareness Symposium, Shelter Pointe Hotel and Marina on Shelter Island, San Diego, CA mail to:AssenmacheTJ@navair.navy.mil

March 18-20, 2001 – National Aviation Environmental Conference, Dallas, TX http://www.airportnet.org/

March 21-23, 2001 – International Symposium on Smart Graphics, Hawthorne, NY http://www.smartgraphics.org/

March 27-29, 2001- The Fifteenth Symposium on Human Factors in Aviation Maintenance, The Brewery Conference Centre, London, UK mail to: enquiries@conference consultancy.com

March 31 – April 5, 2001- CHI 2001, Seattle, WA http://www.acm.org/chi2001

April 3-5, 2001 – Maintenance Repair and Overhaul Conference and Exhibition, Dallas, TX http://www.aviationnow.com/

April 8-14, 2001 – Sun 'n Fun EAA Fly-In, Lakeland, FL http://www.sun-n-fun.com/

April 24-26, 2001 – 46th Annual Corporate Aviation Safety Seminar, Orlando, FL http://www.nbaa.org/

April 30-May 2, 2001- Regional Airline Association Convention, Tampa, FL http://www.raa.org/

May 3-4, 2001 – Human Factors for Aviation Technicians Workshop, Long Beach, CA http:www.greyowl.com

May 14-17, 2001 – DOD Technical Advisory Group Meeting, Antler's Adam's Mark Hotel, Colorado Springs, CO http://dticam.dtic.mil/hftag/

June 3-8, 2001- Society for Information Display, International Symposium, Seminar & Exhibition, San Jose Convention Center, San Jose, CA mail to: pdrzaic@elink.com

June 17-24, 2001 – Paris Air Show, Le Bourget, France http://www.promosalons.com/

July 8-11, 2001 – ATCA 12th Annual International Technical Conference & Exhibition, Conrad International Hotel, Dublin, Ireland http://www.atca.org/

August 5-10, 2001 – 9th International Conference on Human-Computer Interaction, New Orleans, LA http://hcii2001.engr.wisc.edu/

September 10-14, 2001 – Aerospace Congress & Exhibition By Aerospace North America and SAE, Washington State Convention and Trade Center, Seattle, WA mail to:kthomson@sae.org

September 18-20, 2001 – NBAA Annual Meeting and Convention, New Orleans, LA http://www.nbaa.org/

October 8-12, 2001 – Human Factors and Ergonomics Society 45th Annual Meeting, Minneapolis, MN http://www.hfes.org/

October 2001- Annual Cabin Safety Research Technical Group Meeting, Taj Mahal Hotel and Casino, Atlantic City, NJ

November, 2001 – DOD Technical Advisory Group Meeting, San Diego, CA http://dticam.dtic.mil/hftag/

November 4-8, 2001 – ATCA 46th Annual International Program & Exhibits, Washington Convention Center, Wash, D.C. http://atca.org/

November 27-30, 2001 - The Third International Aviation Security Technology Symposium, Tropicana Resort & Casino, Atlantic City, NJ, sponsored by the FAA Aviation Security R&D Division and National Safe Skies Alliance. Symposium topics include: Trace Detection, Bulk Detection, Human Factors, Technical Integration, Operational Testing and Evaluation, Deployment, Aircraft Hardening, Emerging Technologies, and other related topics. http://www.safeskiesinternational.org/symposium_2001.htm

December, 2001 – EUROCONTROL Air Traffic Management R&D Seminar, Santa Fe, New Mexico http://eurocontrol.fr/

September 23-27, 2002 – Human Factors and Ergonomics Society 46th Annual Meeting, Pittsburgh, PA http://www.hfes.org/

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

Comments or questions regarding this newsletter?
Please contact Bill Berger at (202) 267-8532
or via e-mail at bill.ctr.berger @faa.gov