



ATO-P R&D

Human Factors Research and Engineering Division

Human Factors Newsletter # 06-06

March 11, 2006 – March 24, 2006

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Articles in this newsletter:

- *Electronic Flight Data in Airport Traffic Control Towers: Literature Review*
- *Flight Simulators*
- *En Route*
- *Traffic Situation Display/Flight Schedule Monitor*
- *Calendar*

Technical Note: Truitt, T. (2006) *Electronic Flight Data in Airport Traffic Control Towers: Literature Review* (DOT/FAA/CT- 05/13). Atlantic City International Airport, NJ: Federal Aviation Administration, William J. Hughes Technical Center.

Executive Summary

Given the Federal Aviation Administration's (FAA) predicted increase in the number of airport traffic control tower (ATCT) operations from 62.7 million in 2003 to 70 million in 2007, the author of this report is investigating the potential effects of implementing electronic flight data systems (EFDSs). The historical artifact of paper flight progress strips (FPS) inherently limits the usefulness of flight data. However, with an EFDS, there is the potential for controllers to acquire, record, and track flight data more efficiently. An EFDS may potentially improve controllers' ability to communicate and share flight data with others, and provide new tools to support controller decision making.

There is a great deal of variability among the 449 ATCTs in the United States. Each ATCT provides different types of services, has different types of supporting equipment, and has different standard operating procedures based on airport configuration and the number and type of controller positions present. While the presence and use of FPSs is common among ATCTs, the ways in which controllers use flight data among these various facilities is not. The variability

between ATCTs poses a significant challenge for the design of an EFDS, and we must understand how controllers use flight data in different types of ATCTs. It is likely that no single EFDS solution will be optimal for all ATCTs.

We must also consider how best to preserve the current benefits afforded by FPSs when designing an EFDS. There is a good deal of debate in the literature regarding the usefulness of FPSs. This debate has typically centered on the en route domain of air traffic control without considering other domains such as the ATCT. Researchers must ask and answer the same types of questions about the ATCT domain as they did in the en route domain, because these are fundamentally different tasks with different cognitive requirements and different interactions with flight data. To date, researchers have conducted very little work in the ATCT domain and it would serve the FAA well to close this gap in our understanding of how controllers operate in the ATCT. The goal of our research is to close this knowledge gap and eventually design optimal solutions for the use of EFD in ATCTs. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 5: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.*

Point of Contact: T. Truitt, WJHTC

Flight Simulators: On March 1, 2006, Dr. Judith Bürki-Cohen of the Volpe Center's Operator Performance and Safety Division attended a seminar of the Civil and Military Flight Simulator Training Device Qualification (FSTD) Standards International Working Group (IWG). The seminar was hosted by the Royal Aeronautical Society in London. Participants discussed the mission of the IWG and received comments from airlines, airplane manufacturers, and simulator manufacturers. From the regulatory side, the FAA National Simulator Program (who had initiated the IWG), the United Kingdom, Canada, and the Netherlands were represented. The purpose of the IWG is to revise the International Civil Aviation Organization's (ICAO) Manual of Criteria for the Qualification of Flight Simulators. The ICAO sent a statement of support. The proposal is to not only define the qualification standards (as done in the current manual), but also the maneuvers that can be trained in each type of simulator. A follow-on meeting is planned at ICAO headquarters in Montreal in June 2006. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 1: Reduce the commercial fatal accident rate.* (J. Bürki-Cohen, Volpe NTSC)

En Route: On March 23, 2006, an engineering research psychologist from the William J. Hughes Technical Center's Human Factors Group presented the initial findings of the Future En Route Workstation Study (FEWS) to the REDAC Human Factors Subcommittee. The focus was on en route sector capacity. FEWS exposed certified professional controllers to traffic levels 33% and 66% higher than those in 2004 and investigated the effect of the availability of data link and integration of automation functions into the controller workstation. Researchers completed an early user involvement exercise evaluating an en route automatic data block offset algorithm as part of an overall program geared towards the workstation of the future. A small number of volunteer supervisory controllers participated. Through the use of generic airspace and simulation, they were able to provide valuable input into the feasibility of the offset process as a potential enhancement for productivity at the en route position. Analysis will continue. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective*

5: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers. (B. Willems, WJHTC)

Traffic Situation Display/Flight Schedule Monitor: On March 28-30, 2006, research psychologists from the William J. Hughes Human Factors Group will support a meeting of the Traffic Management User Team. Participants will review proposed enhancements to the Traffic Situation Display and Flight Schedule Monitor. They will also conduct an operational test of the latest release of these tools, and will develop test procedures that exercise new functions and commonly performed functions on these systems. Participants from the field will be observed as they complete the procedures. Usability issues or system anomalies will be documented. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 5: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.* (T. Yuditsky, WJHTC)

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

Paul Krois
FAA (ATO-P R&D Human Factors)



March 25-29, 2006 – IEEE Virtual Reality Conference, Hilton Alexandria Mark Center, Alexandria, VA <http://www.vr2006.org/>

March 27-31, 2006 – International Federation of Air Traffic Controllers Annual Conference, Kaohsiung, Taiwan http://www.ifatca.org/conferences/annual_conference.htm

March 28-30, 2006 – PAMA 35th Annual Aviation Maintenance Symposium, Las Vegas Convention Center, Las Vegas, NV <http://www.sae.org/events/pama/ams/>

March 28-30, 2006 – Aviation Industry Expo, Las Vegas, NV
<http://www.aviationindustryexpo.com>

April 4-5, 2006 – 7th Airline Maintenance Conference, Crowne Plaza Hotel, Prague, Poland
http://www.aviationindustrygroup.com/index.cfm?pg=137#section_introduction

April 4-10, 2006 – Sun 'n Fun, Lakeland, FL <http://www.sun-n-fun.org/content/>

April 6-7, 2006 – National Human Capital Summit, Chicago Marriott Downtown, Chicago, IL
http://www.humancapitalinstitute.net/conference_national.html

April 17-19, 2006 – NBAA Maintenance Management Conference, Dallas, TX
<http://web.nbaa.org/public/cs/mmc/200604/>

April 18-20, 2006 – FAA Aviation Safety Programs Conference, Grand Hyatt Hotel, Denver, CO
<http://www.aviationsafetyconference.com>

April 22-27, 2006 – CHI 2006, Montreal, Quebec, Canada
<http://www.chi2006.org/call/hcioverviews.php>

April 23-28, 2006 - Avionics Systems Division Meeting, New Orleans, LA (TBD)
lemon@sae.org

April 24-25, 2006 – AIAA Inside Aerospace...An International Perspective, Renaissance, Washington, Wash, DC
<http://www.aiaa.org/content.cfm?pageid=230&lumetingid=1388>

April 24-26, 2005 – ATCA/FAA/NASA Annual Technical Symposium, Atlantic City, NJ
http://www.atca.org/activities/event_items.asp?month=4&year=2006&item_id=3557

April 25-27, 2006 – Maintenance, Repair & Overhaul (MRO) Conference & Exhibition, Phoenix Civic Plaza, Phoenix, AZ
<http://www.aviationnow.com/conferences/mromain.htm>

May 1-4, 2006 - 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference; 14th AIAA/ASME/AHS Adaptive Structures Conference; 7th AIAA Gossamer Spacecraft Forum; 2nd AIAA Multidisciplinary Design Optimization Specialist Conference; 1st AIAA Non-Deterministic Approaches Conference, Hyatt Regency Newport, Newport, RI
<http://www.aiaa.org/>

May 3-5, 2006 - 6th Annual European Business Aviation Convention & Exhibition (EBACE2006), Geneva, Switzerland
<http://web.nbaa.org/public/cs/amc/>

May 6-7, 2006 - Alaska State Aviation Trade Show & Conference, Anchorage International Airport, AK
aviation@gwu.edu

May 8-18, 2006 - Aviation Safety & Security Certificate Program, Dulles Airport, VA

May 9-11, 2006 – Flight Safety Foundation 51st Annual Corporate Aviation Safety Seminar, Phoenix, AZ
<http://www.flightsafety.org/seminars.html#eass>

May 14-18, 2006 - 77th Annual Scientific Meeting of the Aerospace Medical Association, Caribe Royale Hotel, Orlando, FL
<http://www.asma.org/>

May 15-16, 2006 – DoD TAG, Las Vegas, NV
<http://hfetag.dtic.mil/meetschl.html>

May 15-16, 2006 – ASTM F38 Unmanned Aircraft Systems Committee Workshop, Sheraton Centre Toronto; Toronto, ON CAN
<http://www.astm.org/>

May 17-19, 2006 – 17th International Conference on Heating and Ventilation, Prague, Czech Republic <http://www.acv2006.cz>

May 22-24, 2006 - 9th IFAC Symposium on Automated Systems Based on Human Skill And Knowledge, Nancy, France <http://www.cdc.gov/niosh/exhibits.html>

May 22-25, 2006 – RAA Annual Convention, Dallas, TX <http://www.raa.org/2006conference/>

May 23-25, 2006 – Defense Standardization Program Conference, Westin Arlington Gateway, Arlington, VA <http://www.sae.org/events/dsp/>

May 23-25, 2006 – 2006 International Air Cargo Conference, Brown Convention Center, Houston, TX <mailto:terryiacc@bellsouth.net>

May 25-28, 2006 – American Psychological Society 18th Annual Convention, New York Marriott Marquis, New York City, NY <http://www.psychologicalscience.org/convention/>

June 6-8, 2006 – IEE System Safety Conference, Savoy Place, London, UK <http://www.iee.org/events/event/CE202BA5-A0D3-8FE7-2F35A59A02C8B3F3>

June 8-10, 2006 – NTSB Bar Association Annual CLE Conference, NTSB Conference Center, L'Enfant Plaza, Wash, DC <http://www.ntsbbbar.org/>

June 11-14, 2006 – The American Society of Safety Engineers Safety 2006 Conference, Washington State Convention and Trade Center, Seattle, WA <http://www.asse.org/2006pdcallforpapers.pdf>

June 12-16, 2006 – UPA 2006 – 15th Annual Conference, Broomfield, CO http://www.usabilityprofessionals.org/conferences_and_events/upa_conference/2006/

June 24-26, 2006 – AAMI Conference & Exposition, Wash, DC <http://www.aami.org/proposals/index.html>

June 24-28, 2006 – ASHRAE Annual Conference, Quebec, Canada <http://www.ashrae.org/>

June 26-29, 2006 - [General Aviation Technology Conference](#) , Hyatt Hotel, Wichita, Kansas,

July, 2006 - 26th International Congress of Applied Psychology, Athens, Greece dgeorgas@dp.uoa.gr , http://www.erasmus.gr/dynamic/conventions.asp?conv_id=21r/dynamic/conventions.asp?conv_id=21

July 5-9, 2006 - International Organization of Women Pilots 2006 Convention, Washington Marriott, Wash, DC <http://www.ninety-nines.org/>

July 10-14, 2006 – IEA 2006, 16th World Congress on Ergonomics, Maastricht, The Netherlands
<http://www.iea2006.org/>

July 17-23, 2006 – Farnborough International Air Show, London, UK
<http://www.farnborough.com/>

July 24-30, 2006 – EAA AirVenture, Oshkosh, WI <http://www.airventure.org/>

July 26-29, 2006 – CogSci 2006, Sheraton Vancouver Wall Centre, Vancouver, BC, Canada
<http://www.cogsci.rpi.edu/~rsun/cogsci2006/>

August 1, 2006 - The International Journal of Aviation Psychology, Special Issue on Air Traffic Control Human Factors, CALL FOR PAPERS. Please contact Jim Hitt at hitt_james@bah.com <mailto:hitt_james@bah.com> or Mike McAnulty at mike.mcanulty@faa.gov <<mailto:mike.mcanulty@faa.gov>> with any queries, or to submit papers.

August 10-13, 2006 – American Psychological Association Annual Meeting, New Orleans, LA
<http://www.apa.org/convention05/future.html>

August 21-24, 2006 - AIAA Modeling and Simulation Technologies Conference and Exhibit. Keystone Resort and Conference Center, Keystone, CO
<http://www.aiaa.org/content.cfm?pageid=1>

August 21-24, 2006 - AIAA Guidance, Navigation, and Control Conference and Exhibit, Keystone Resort and Conference Center, Keystone, CO
<http://www.aiaa.org/content.cfm?pageid=1>

August 29-31, 2006 – General Aviation Technology Conference & Exhibition, Wichita Hyatt, Wichita, KS <http://www.sae.org/events/gat/>

September 6-8, 2006 - 11th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Renaissance Portsmouth, Portsmouth, VA,
<http://www.aiaa.org/content.cfm?pageid=1>

September 6-7, 2006 - FAA-ATA 18th Annual International Symposium for Human Factors in Maintenance and Ramp Safety, Orlando, FL. www.airlines.org

September 10-14, 2006 - 54th International Congress of Aviation and Space Medicine, Bangalore, India. A preliminary registration form may be found at <http://www.isam-india.org/conference44/newreg.php>.

September 12-14, 2006 – 23rd International Air Cargo Forum and Exposition, Calgary, Ontario, Canada <http://www.tiaca.org>

September 20-22, 2006 – HCI-Aero 2006, Seattle, WA <http://www.eurisco.org/hci-aero2006>

Note: Submission Deadlines:

15th March 2006 - Full Research Papers

15 April 2006 - Industry Papers

15 April 2006 - Early Stage Research Papers

15 April 2006 - Panels, Workshops

15 April 2006 - Posters and Demos

September 26-27, 2006 – AIAA Aviation Technology, Integration and Operations Conference, Hyatt Regency, Wichita, KS <http://www.aiaa.org/content.cfm?pageid=1>

October 8-11, 2006 - IEEE International Conference on Systems, Man, and Cybernetics, The Grand Hotel, Taipei, Taiwan <http://ins.cn.nctu.edu.tw/smc2006/>

March 1, 2006: Deadline for submission of papers (full papers only)

October 15-19, 2006 – Digital Avionics Systems Conference, 25th DASC Network Centric Environment: The Impact on Avionics and Systems, Hilton Portland and Executive Tower, Portland, OR www.dasconline.org

February 19, 2006 – Deadline for submitting abstracts of 1000 words

October 15-20, 2006 – 2nd Annual Augmented Cognition International Conference, Hilton San Francisco, San Francisco, CA www.augmentedcognition.org

October 16-20, 2006 – Human Factors and Ergonomics Society Annual Meeting, San Francisco Hilton, San Francisco, CA <http://www.hfes.org/web/HFESMeetings/meetings.html>

Key Dates:

March 1, 2006 - Proposals (all presentation types)

April 18, 2006 - Accept/reject letters sent

May 8, 2006 - Workshop preliminary handouts due

May 16, 2006 - Proceedings paper prep instructions available

May 22, 2006 - Workshop final acceptances sent

June 5, 2006 - Online preliminary program available

June 26, 2006 - Proceedings papers due

September 8, 2006 - Early registration deadline

October 17-19, 2006 – NBAA 59th Annual Meeting and Convention, Orlando, FL <http://web.nbaa.org/public/cs/amc/futuresites.php>

October 23-25, 2006 – 44th Annual SAFE Symposium, Reno Hilton Hotel, Reno, NV <http://www.safeassociation.org/symposium.htm>

October 23-26, 2006 - DoD Maintenance Symposium & Exhibition, Reno Hilton, Reno, Nevada <http://www.sae.org/events/conferences/aerospace/>

October 29 - November 1, 2006 – ATCA Convention and Exposition, Marriott Wardman Park, Wash, DC

November 9-11, 2006 – AOPA Expo 2006, Palm Springs, CA
<http://www.aopa.org/expo/2005/virtual/>

November 13-14, 2006 ASTM F38 Unmanned Aircraft Systems Committee Workshop, Hyatt Regency, Atlanta, GA <http://www.astm.org/>

January 8-11, 2007 - 45th AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/content.cfm?pageid=1>

January 27-31, 2007 - ASHRAE Winter Meeting, Dallas, TX jyoung@ashrae.org, or www.ashrae.org.

March 7-8, 2007 – Avionics 07 Expo XXI, Amsterdam http://www.avionics-event.com/avionics06/why_exhibit.html

May 21-22, 2007 - ASTM F38 Unmanned Aircraft Systems Committee Workshop, Waterside Convention Center, Norfolk, VA <http://www.astm.org/>

June 23-27, 2007 – ASHRAE Annual Meeting, Long Beach, CA jyoung@ashrae.org, www.ashrae.org

July 22-27, 2007 – 12th HCI International, Beijing, China <http://www.hcii2007.org/>

September 25-27, 2007 - NBAA 60th Annual Meeting and Convention, Atlanta, GA
<http://web.nbaa.org/public/cs/amc/futuresites.php>

October 1-5, 2007 – Human Factors and Ergonomics Society Annual Meeting, Baltimore Waterfront Marriott Hotel, Baltimore, MD
<http://www.hfes.org/web/HFESMeetings/meetings.html>

November 13-16, 2007 – DoD Maintenance Symposium and Exhibition, Rosen Shingle Creek, Orlando, FL <http://www.sae.org/events/conferences/aerospace/>

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