AAR-100

Human Factors Newsletter # 01-24

(December 1, 2001 – December 14, 2001)

Human Error: A technical paper entitled Development of an FAA-EUROCONTROL Approach to the Analysis of Human Error in ATM prepared by Dr. Anne Isaac (EUROCONTROL Human Factors and Manpower Unit) and Dr. Julia Pounds (FAA CAMI) was presented at the FAA-EUROCONTROL ATM 2001 R&D symposium in Santa Fe, NM by Dr. Paul Krois. The paper reported on the results from Action Plan 12 involving the harmonization of two techniques for identifying and assessing the causal factors of human error in operational errors and incidents. (P. Krois, AAR-100)

Enhanced Vision Sensors (EVS): The Naval Research Laboratory (NRL) (Code 5636, Dr. Dean Scribner and Dr. Penny Warren) Washington D.C. collected low-light visible and infrared imagery from the roof of the Naval Air Station Patuxent River Air Operations building on July 9-12, 2001 and demonstrated the EVS technology to ARQ and ATP representatives on November 28th, 2001 at NRL. The project, entitled "Enhanced Vision (EV) Feasibility Investigations for Federal Aviation Administration Ground Controllers", is co-sponsored by the Office of Naval Research (Dr. Joel Davis at Code 34) and AAR-100. The objective of the demonstration was to investigate the feasibility of using enhanced vision technology to aid the tower controller in gaining and maintaining situation awareness of airport traffic under night and low-visibility conditions (W. Krebs, D. Piccione, AAR-100).

Enhanced Vision Security Surveillance: On October 22, 2001, representatives from AAR-100 and Dr. Penny Warren (Naval Research Laboratory) briefed CAPT Hovatter, Naval Air Station Patuxent River Commanding Officer, and Air Operations personnel on the Enhanced Vision Sensors (EVS) July 2001 results (above article). CAPT Hovatter endorsed the EVS concept to improve perimeter security. Since September 11th, airfield perimeter and surface surveillance is a high priority for airport security personnel. In most cases, numerous personnel must defend miles of coastline, roadways, and terrain from unauthorized intruders whose intention may be to inflict injury or damage resources on an airport surface. As a result of the recent terrorist attacks, additional manpower is required to patrol (i.e., walking, driving, and boat) the perimeter and monitor the airport surface. The additional security personnel requirement will increase airport personnel costs and the security personnel have a higher likelihood of missed detection of an unauthorized intruder during nighttime or poor visibility conditions. The proposed solution would be a mobile Enhanced Vision Security Surveillance (EVSS) suite unit, which fuses

thermal, visible, and radar information from a ground based moving vehicle and acoustic information from an underwater passive acoustic sonar buoy array (if the airport has a coastline). Thermal, visible, and radar sensors would be positioned on the airport surface with the output sent to the mobile unit. A single operator views the sensor-fused information along with other intelligence information on a digitized map. The EVSS command center consolidates the resources into a single command center thereby reducing manpower requirements while improving threat detection for a designated area (W. Krebs, D. Piccione, AAR-100).

Remote ARTS Color Display (R-ACD): Human factors researchers conducted a visual performance test at the William J. Hughes Technical Center's Human Factors Laboratory on November 6-7, 2001 to assess air traffic controllers' readability of text on the General Digital AMLCD 20" display. Uniform gray (daytime) and black (nighttime) patterns were used as the background for randomly selected text blocks (varying luminance, color, and size) positioned in eight rows of letters. Observers' task – similar to Snellen acuity test - was to read the letters for each row at three different locations from the monitor. Researchers from NASA-Ames and the FAA will use this data to further develop their color model to aid human factor personnel in selecting the optimal color text and background combinations for air traffic control displays. Ultimately, human factors personnel would use the color model to select the optimal RGB values for a given displayed object, thereby narrowing the numerous color combinations (256^3) into a set of optimal color choices for any given monitor. This research supported the Remote ARTS Color Display acquisition program office to determine the effectiveness of the various color palettes. The R-ACD program office tested the General Digital AMLCD 20" display as a possible candidate to replace the current monochrome tower displays. (W. Krebs, AAR-100)

Realistic Radio Communications: From November 13 through November 14, 2001, a Volpe NTSC human factors researcher traveled to Denver, Colorado in order to participate in the International Air Transport Association's Flight Simulator Working Group Taskforce on Simulated Air Traffic Control Environment. She had been asked to participate in the task force assembled for this purpose based on her work on Realistic Radio Communications Simulation. The task force was comprised of senior airline managers, simulator manufacturers, and flight simulator evaluator pilots. The expected outcome of the taskforce is a report on the efficacy of implementing this feature in future LOFT training. (J. Bürki-Cohen, Volpe NTSC)

Remote ARTS Color Display: Researchers from the William J. Hughes Technical Center's NAS Human Factors Branch (ACT-530) and the Office of the Chief Scientific and Technical Advisor for Human Factors (AAR-100) conducted a two-phase human factors assessment of the Remote ARTS Color Display (R-ACD). The R-ACD provides sites using the Common ARTS platform with a replacement tower radar display. The human factors assessment examined how easily controllers could read and use information in the tower environment. The assessment examined the monitor in several viewing angles, distances, illuminations, font sizes, and brightness settings. ACT-530 and AAR-100 briefed members of the R-ACD development team, providing results and recommendations. The R-ACD is scheduled to be fielded in early 2002. (K. Allendoerfer, WJHTC; D.Piccione, AAR-100)

Cockpit Procedures: Southwest Airlines is starting a review of its normal cockpit procedures and checklists with the aim of reducing crew vulnerability to error. The airline has asked a NASA-Ames team to advise them on designing and conducting the review process. The review

will draw heavily on data generated by the FAA co-sponsored project on Interruptions, Distractions, and Lapses of Attention in the Cockpit. (E. Edens, AFS-230; L. Loukopoulos, I. Barshi, K. Dismukes, NASA-Ames)

En Route Automation Modernization Requirements: A revised Section 6 (Human Integration) was prepared and submitted to ARQ for incorporation in the Requirements Document under preparation. This revision incorporates previous investigative work conducted under AUA-200 auspices, a new structural outline for human-system engineering requirements, common approaches for AT and AF, and added details in several subsections of the human integration requirements. This work is part of a larger, continuing endeavor being conducted in AAR-100 to develop improved human factors guidelines for the AMS process. (R. Gray, AAR-100)

AAR-100-funded Research Software Transfers to ATC Research: At NASA-Ames, Dr. Richard Lanier, an FAA researcher with ACT-206, is currently investigating the Knowledge Assessment Tool Set (TPL-KATS) developed with AAR-100 funding by the University of Central Florida (UCF) for use in support of En Route Descent Advisor (EDA) system development. In addition to Dr. Lanier, researchers from the US Navy, George Mason University, and the University of Colorado have requested copies of the software and are currently investigating its use. Further inquiries were received from researchers at the University of Connecticut and at the University of Maryland. TPL-KATS is a software tool set that has been developed as part of UCF's research grant on training the cognitive skills required to operate automated aircraft. It incorporates computerized versions of card sorting and concept mapping, two frequently used knowledge structure assessment techniques. The KATS software computerizes the administration and scoring of these assessments, saving time and effort while reducing the potential for error. The tool's use to train pilots and evaluate their knowledge of automated systems in the airline environment is currently being investigated by UCF. (E. Edens, AFS-230; F. Jentsch, UCF)

JANUS:

- A CAMI investigator traveled to Milan, Italy to participate with accident investigators from the FAA Office of Accident Investigation (AAI-100), Cessna, and Boeing in the preliminary inquiry by the Italian government's investigators into the accident on October 8, 2001 at Linate Airport in Milan which resulted in 118 fatalities. An MD-87 taking off from the airport in poor visibility conditions struck a Cessna Citation II. The Cessna entered the active runway by mistake. The MD-87 then swerved off the runway and collided with the airport's baggage handling building. Information about the event was organized using the JANUS human factors incident analysis technique, and the results were submitted to AAI for review. (J. Pounds, CAMI)

- The same CAMI investigator traveled to Nashua, NH to provide a briefing to New England Region's (ANE) air traffic regional and facility management and NATCA representatives regarding their participation in the JANUS beta test. She was accompanied by Ms. Christine Soucy (AAT-200), Mr. Jim Beadling (ATL NATCA), and Mr. Scott Keller (D10 NATCA). The briefing kicked off ANE's participation in the field test of the human factors technique for identification of causal factors in operational

errors. An overview of the technique was presented and everyone's roles and responsibilities were discussed. The beta test will run in parallel with, but separate from, the FAA's existing Quality Assurance (AAT-200) investigation process. Results of the beta test will be used to validate the new process. (J. Pounds, CAMI)

Line Operations Safety Audit (LOSA):

- Following the First ICAO/University of Texas (UT) LOSA Week in Hong Kong in June, the second LOSA Week sponsored by ICAO, COPA Airlines, and the UT Human Factors Research Group was held in Panama City, Panama November 27-29, 2001. More than 100 attendees from 31 airlines in Central America, Latin America and Spain participated in a workshop on LOSA and a demonstration of Threat and Error Management CRM derived from LOSA. (E. Edens, AFS-230; R. Helmreich, UT)
- A briefing on LOSA for the ICAO Air Navigation Commission and members of the ICAO Council was held in Montreal on December 5, 2001. It has been recommended that LOSA become a recommended practice for ICAO members by 2003 and an ICAO Standard by 2005. The role of the FAA in sponsoring the development of LOSA was recognized. (E. Edens, AFS-230; R. Helmreich, UT)
- Discussion of the role of the International Air Transport Association (IATA) in support of LOSA was held at IATA headquarters in Montreal on December 6, 2001. IATA has previously endorsed LOSA and is going to further announce its sponsorship as a 2002 safety initiative. (E. Edens, AFS-230; R. Helmreich, UT)
- Two members of the UT Project were part of a workshop sponsored by the Daimler-Benz Foundation on the use of behavioral markers to assess crew performance. The workshop evaluated and contrasted the Non-Technical Behaviors (NOTECHS) used for crew assessment in the European Union with the behavioral markers used in AQP. A booklet with recommendations for the use of markers was published by the Daimler-Benz Foundation and is available from the UT group. (E. Edens, AFS-230; R. Helmreich, UT)

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

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January 13-17, 2002 – Transportation Research Board Meeting, Washington, DC
http://www.trb.org/trb/meeting

February 26-March 3, 2002 – Air Freight Expo 2002, Shangri-La Hotel, Singapore http://www.eyefortransport.com/asia2001

March 2002 – European Transportation Leaders Conference, Landmark Hotel, London http://www.aviationnow.com/conferences

March 7-8, 2002 – Potomac Chapter Human Factors and Ergonomics Society Mid-Year Symposium, Ft. Belvoir Officer's Club, Virginia mailto:jerrykrueg@aol.com

March 10-12, 2002 – Air Freight Expo 2002, http://www.airfreightexpo.com/

March 11-15, 2002 – Global Cargo Week & Dangerous Goods by Air Conference & Exhibition, Sofitel Forum Rive Gauche, Paris, France http://www.iataonline.com/

April 9-11, 2002 – Maintenance, Repair and Overhaul Conference & Exhibition, Phoenix Convention Center, Phoenix, AZ http://www.aviationnow.com/conferences

May 5-9, 2002 – 73rd Annual Scientific Meeting of the Aerospace Medical Association, Queen Elizabeth's Hotel, Montreal, Canada http://www.asma.org/

May 6-12, 2002 – International Aerospace Exhibition and Conference, Berlin Brandenburg International Airport, Berlin, Germany http://www.ila-berlin.com/

May 20-22, 2002 – 11th Annual Phoenix International Aviation Symposium, The Phoenician Resort, Phoenix, AZ http://www.phxskyharbor.com/

August 27-30, 2002 – Measuring Behavior 2002, 4th International Conference on Methods and Techniques in Behavioral Research, University of Amsterdam, Amsterdam, The Netherlands http://www.noldus.com/events/mb2002/index.html

September 17-20, 2002 – International Air Cargo Forum, Hong Kong http://tiaca.org/

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

October 27-31, 2002 – 21st Digital Avionics Systems Conference, Hyatt Regency Hotel, Irvine, CA http://www.dasconline.org/

April 7-27, 2003 – Aviation World's Fair, Newport News/Williamsburg, VA http://www.worlds-fair.com/

May 4-9, 2003 – 74th Annual Scientific Meeting of the Aerospace Medical Association, Convention Center, San Antonio, TX http://www.asma.org/

October 13-17, 2003 – Human Factors and Ergonomics Society 47th Annual Meeting, Adams Mark Denver Hotel, Denver, CO http://www.hfes.org/

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

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

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

Comments or questions regarding this newsletter?
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