



## ATOP-R&D

### Human Factors Newsletter # 05-18

September 17, 2005 – September 30, 2005

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- *Language Barriers Result in Maintenance Deficiencies*
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**Technical Note:** *Simultaneous Analysis of Thebaine, 6-MAM and Six Abused Opiates in Postmortem Fluids and Tissues using Zymark<sup>®</sup> Automated Solid-Phase Extraction and Gas Chromatography-Mass Spectrometry.* Lewis, R.J., Johnson, R.D. and Hattrup, R.A. Civil Aerospace Medical Institute, Federal Aviation Administration, Forensic Toxicology Research Laboratory, AAM-610, Oklahoma City, OK

- Abstract: Opiates are some of the most widely prescribed drugs in America and are often abused. Demonstrating the presence or absence of opiate compounds in postmortem fluids and/or tissues derived from fatal civil aviation accidents can have serious legal consequences and may help determine the cause of impairment and/or death. However, the consumption of poppy seed products can result in a positive opiate drug test. We have developed a simple method for the simultaneous determination of eight opiate compounds from one extraction. These compounds are hydrocodone, dihydrocodeine, codeine, oxycodone, hydromorphone, 6-monoacetylmorphine, morphine, and thebaine. The inclusion of thebaine is notable as it is an indicator of poppy seed consumption and may help explain morphine/codeine positives in cases where no opiate use was indicated. This method incorporates a Zymark<sup>®</sup> RapidTrace™

automated solid-phase extraction system, gas chromatography/mass spectrometry, and trimethyl silane (TMS) and oxime-TMS derivatives. The limits of detection ranged from 0.78 – 12.5 ng/mL. The linear dynamic range for most analytes was 6.25 – 1600 ng/mL. The extraction efficiencies ranged from 70 – 103%. We applied this method to eight separate aviation fatalities where opiate compounds had previously been detected.

*This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1 and 2: Reduce the commercial fatal accident rate; Reduce the number of fatal accidents in general aviation.*

Point of Contact: J. Whinnery, CAMI

**Technical Note:** A report titled "Language Barriers Result in Maintenance Deficiencies" is available at [http://www.hf.faa.gov/docs/508/docs/maint\\_Language\\_final.pdf](http://www.hf.faa.gov/docs/508/docs/maint_Language_final.pdf). This document addresses an Aviation Maintenance Human Factors requirement "to determine whether the growing number of maintenance and inspection personnel who possess a wide range of non-native English reading, writing, and speaking abilities are more inclined to commit an error than personnel whose native language is English." *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1 and 2: Reduce the commercial fatal accident rate; Reduce the number of fatal accidents in general aviation.* (W. Krebs, ATO-P R&D)

**Line Operations Safety Audit (LOSA) Conference:** The Third International Civil Aviation Organization/International Air Transport Association LOSA Conference was held in Kuala Lumpur, Malaysia on September 13-14, 2005. The event was hosted by Malaysia Airlines. In addition to LOSA, the conference also included Threat and Error Management (TEM) and the Air Traffic Normal Operations Safety Survey Program. More than 250 delegates attended meetings, including regulators, aircraft manufacturers, airline operational and safety personnel, and air traffic managers, making it the most well attended conference to date. Presentations focused on LOSA implementation and the use of LOSA data in the safety change process, TEM training, and the application of LOSA methodology to the Air Traffic Control environment. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1 and 7: Reduce the commercial fatal accident rate; Enhance the safety of FAA's air traffic systems.* (E. Edens, ATO-P R&D)

**Human Performance:** From September 20 to 22, 2005 Alfretria Scarborough and Nelda Milburn attended the Second Safety Across High-Consequence Industries Conference held at the Saint Louis University. Ms. Scarborough presented "JANUS-GRO: A Human Factors Taxonomy for Ground Operations." This presentation described a human performance taxonomy developed to classify vehicle incidents. The process has been used to examine a sample of incidents from the vehicle and pedestrian deviations database. The results revealed that JANUS-GRO could be used to provide additional information for the current accident reporting system. Dr. Milburn presented "Mining for Information in Accident Data," a paper that evaluated the usefulness of the WinMine software program for data mining. The interactive graphs produced by the software tool kit are especially useful for visualizing relationships between variables, and exploring, interpreting, and even making predictions from categorical data. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety,*

*Objectives 1 and 4: Reduce the commercial fatal accident rate; Reduce the risk of runway incursions. (N. Milburn, CAMI)*

**National Traffic Management Log (NTML):** The NTML Work Group will schedule an October meeting at the William J. Hughes Technical Center. The NTML Work Group has identified a number of issues with how Flight Restriction Traffic Management Initiatives (TMIs) are processed using the current version of the NTML system. The primary purpose of this meeting will be to define system requirements for NTML Version 3.07, which will redesign how Flight Restriction TMIs are implemented using NTML. Human factors researchers will provide technical support to the NTML Work Group. Expected activities include assisting in the development of software requirements, designing and rapid prototyping candidate interface concepts, and reviewing candidate requirements against human factors principles and established design standards. *This research activity supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers. (T. Yuditsky, WJHTC)*

**Airspace Flow Systems (AFP):** Tanya Yuditsky will support a human-in-the-loop (HITL) test of AFPs. This is one in a series of HITL activities to plan and evaluate implementation of AFPs. During the test, representatives from the FAA and their customers will step through the process of identifying the constrained area, issuing an AFP, and observing its effect on traffic flow. A key focus will be the tools used throughout this process and their user interfaces. Some of the traffic management tools used in the field today, such as Flight Schedule Monitor and Traffic Situation Display, will be enhanced to provide unique capabilities for AFPs. Information requirements will be assessed to determine whether the existing tools adequately support operational tasks. *This research activity supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers. (T. Yuditsky, WJHTC)*

**Alarms and Alerts in Technical Operations (TO):** Personnel from the William J. Hughes Technical Center visited the Potomac Super-TRACON and interviewed TO specialists and administered questionnaires on alarms and alerts. The information was incorporated into the experimental design plan, formally named Optimal Design of Event Lists Study (ODELS). All conditions for the ODELS were finalized and the data presentation and collection software was also completed. To date, there have been 20 participants, including five pilots. Ten more participants are scheduled. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 7: Enhance the safety of FAA's air traffic systems. (V. Ahlstrom, WJHTC)*

**Future En Route Workstation (FEWS):** The Data Link Working Committee sees a direct application of FEWS results to data link evolution. Work being conducted at the William J. Hughes Technical Center on FEWS is specifically cited by the Performance-based Operations Aviation Rulemaking Committee Communications Working Group in its roadmap for the future of data link: "The FAA Human Factors Laboratory started work on a new controller interface, the FEWS, to seamlessly integrate these and other decision support tools. This work is proceeding, and will feed the ATC requirements for mid-term implementation of data link". The work group recommends increased priority and funding of FAA research into the FEWS human computer interface. A primary objective of this research is to seamlessly integrate data link with

other FAA decision support tools. *This research activity supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.* (B. Willems, WJHTC)

**En Route Information Display System (ERIDS):** William J. Hughes Technical Center personnel briefed managers and staff at the Jacksonville ARTCC concerning data gathering efforts on the ERIDS. The briefings were informative and concise, and generated a genuine interest in the study. Data gathering will be conducted in October 2005. The manager of the Traffic Management Unit wrote the following: "ZJX will make every effort to accommodate the needs of your group and endeavor to make your project a success. We realize the importance of this research and welcome your group to our facility". *This research activity supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers.* (R. Sollenberger, 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)



**October 6-9, 2005** – Aviation North Expo Conference, Fairbanks Princess Riverside Lodge, Fairbanks, AK [www.AviationNorth.org](http://www.AviationNorth.org)

**October 9-11, 2005** – Aviation Maintenance Star Symposium, Ritz-Carlton, Phoenix, AZ [www.STARSymposium.com](http://www.STARSymposium.com)

**October 10-13, 2005** - S-7 Flight Deck & Handling Qualities Standards for Transport Aircraft Toulouse, France [mlemank@sae.org](mailto:mlemank@sae.org)

**October 17-21, 2005** - American Association for Aerosol Research 2005 Annual Conference, Hilton Austin, Austin, TX <http://www.cdc.gov/niosh/exhibits.html>

**October 18-20, 2005** - S-9 Cabin Safety Technical Committee Meeting, Phoenix, AZ, [mlemank@sae.org](mailto:mlemank@sae.org)

**October 18-21, 2005** - [2005 SAE Control & Guidance Systems Committee Meeting No. 96](#) Harbor Town Resorts, Hilton Head, South Carolina, USA

**October 20-21, 2005** – 2<sup>nd</sup> Annual FAA International Safety Forum, Westfields Marriott, Chantilly, VA <http://www.faa.gov/news/conferences/safetyforum/index.cfm?topic=6>

**October 22-26, 2005** – American Medical Informatics Association Annual Symposium, Hilton Washington, Wash, DC <http://www.amia.org/meetings/annual/current/>

**October 23-26, 2005** - UIST 2005, Eighteenth Annual ACM Symposium on User Interface Software and Technology, Seattle, WA <http://www.acm.org/uist/index.html>

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

**October 24-26, 2005** – 43<sup>rd</sup> SAFE Symposium, Grand America Hotel, Salt Lake City, UT <http://www.safeassociation.org/symposium.htm>

**October 24-27, 2005** - [DoD Maintenance Symposium & Exhibition](#)  
Sheraton Birmingham Hotel and Birmingham-Jefferson Convention Complex, Birmingham, Alabama,

**October 25-26, 2005** - 2005 International Symposium: Beyond Regulatory Compliance, Making Safety Second Nature, Reed Arena, Texas A&M University, College Station, TX <http://www.cdc.gov/niosh/exhibits.html>

**October 26-28, 2005** – Air Cargo Americas, Radisson Centre, Miami, FL [www.aircargoamericas.com](http://www.aircargoamericas.com)

**October 26-28, 2005** - A-10 Aircraft Oxygen Equipment Committee Meeting, Salt Lake City, UT [mlemank@sae.org](mailto:mlemank@sae.org)

**October 27-28, 2005** - Second International Conference on Knowledge Management ICKM2005, Westin Charlotte, Charlotte, NC <http://www.asis.org/ICKMcall.htm>

**October 30-November 7, 2005** – ATCA 50<sup>th</sup> Annual Conference and Exposition, Dallas, TX [http://www.atca.org/event\\_items.asp](http://www.atca.org/event_items.asp).

**October 30—November 3, 2005** – 24<sup>th</sup> Digital Avionics Systems Conference, Hyatt Regency Crystal City, Wash., DC <http://www.dasconline.org>

**November, 2005** – DoD TAG (Human Factors Engineering Technical Advisory Group) Meeting, Baltimore, MD <http://hfetag.dtic.mil/meetschl.html>

**November 3-5, 2005** - AOPA Expo, Tampa, Florida [www.aopa.org](http://www.aopa.org)

**November 3-5, 2005** - Conference on Designing for User Experience, Fort Mason, San Francisco, CA <http://www.dux2005.org/>

**November 6-9, 2005** - ACI World / Pacific Conference and Exhibition, Auckland, New Zealand. [www.auckland-airport.co.nz](http://www.auckland-airport.co.nz)

**November 7-9, 2005** – DoD TAG, Baltimore, MD <http://hfetag.dtic.mil/meetschl.html>

**November 7-10, 2005** – Flight Safety Foundation 58<sup>th</sup> Annual International Air Safety Seminar, Moscow, Russia [http://www.flightsafety.org/iass05\\_cfp.html](http://www.flightsafety.org/iass05_cfp.html)

**November 7-10, 2005** - Ergonomics and Human Factors: Applications in Occupational Safety and Health, Harvard School of Public Health, Cambridge, MA  
<http://www.hsph.harvard.edu/ccpe/programs/EHF.shtml>

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

**November 8-10, 2005** – Maintenance, Repair & Overhaul Exhibition Asia, Suntec Convention Center, Singapore <http://www.aviationnow.com/conferences/masmain.htm>

**November 10, 2005** - 34th Annual Meeting of the Society for Computers in Psychology, Toronto, Ontario, Canada <http://www.scip.ws>

**November 10 - 13, 2005** - 46th Psychonomic Society Annual Meeting, Toronto, Ontario, Canada <http://www.psychonomic.org/meet.htm>

**November 15-17, 2005** - National Business Aviation Association's 58th Annual Meeting & Convention, New Orleans, LA (TBD) [www.nbaa.org](http://www.nbaa.org)

**November 16-17, 2005** – IEE Human Factors Engineering Professional Network/MoD Human Factors Integration Defense Technology Center “People and Systems Symposium: Who Are We Designing For?”, Grange City Hotel London, UK <http://conferences.iee.org/pas2005>

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

*January 21-25, 2006 – ASHRAE Winter Meeting and Expo, Chicago, IL*  
<http://www.ashrae.org/template/AssetDetail/assetid/45794>

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

**January 23-27, 2005** - S-18 Safety Assessment for Airborne Systems & Equipment San Antonio, TX, [lemon@sae.org](mailto:lemon@sae.org)

**February 9-10, 2006** - Swinburne University Symposium on Safety Management and Human Factors Symposium, Melbourne, Australia [janca@groupwise.swin.edu.au](mailto:janca@groupwise.swin.edu.au)  
<http://www.swin.edu.au/aviation/forms/2006SwinburneSymposiumCallforPapers.pdf>

**February 21-26, 2006** – Asian Aerospace 2006, Changi Exhibition Centre, Singapore  
[www.asianaerospace.com](http://www.asianaerospace.com)

*February 26-28, 2006 – Heli-Expo, Dallas, TX <http://www.heliexpo.com>*

**March 13-15, 2006** – Flight Safety Foundation 18<sup>th</sup> Annual European Aviation Safety Seminar, Athens, Greece <http://www.flightsafety.org/seminars.html#eass>

**March 20-23, 2006** – 16<sup>th</sup> Annual AAMI/FDA International Conference on Medical Device Standards and Regulation, Hyatt Regency, Reston, VA  
<http://www.aami.org/meetings/isc/index.html>

**March 22 - 25, 2006** - Society for Behavioral Medicine Annual Meeting and Scientific Sessions, San Francisco, CA [www.sbm.org/annualmeeting/index.html](http://www.sbm.org/annualmeeting/index.html)

**March 23-25, 2006** - 17th Annual International Women in Aviation Conference, Opryland Hotel Nashville, TN <http://www.wai.org/>

**March 23-27, 2005** – IA Summit 2006, Hyatt Regency, Vancouver, BC, Canada  
<http://www.iasummit.org/>

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

**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](http://www.humancapitalinstitute.net/conference_national.html)

**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](mailto:lemon@sae.org)

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

**May 14-18, 2006** - 77<sup>th</sup> 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 17-19, 2006 – 17<sup>th</sup> 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 25-28, 2006** – American Psychological Society 18<sup>th</sup> Annual Convention, New York Marriott Marquis, New York City, NY <http://www.psychologicalscience.org/convention/>

**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 – 15<sup>th</sup> Annual Conference, Broomfield, CO  
[http://www.usabilityprofessionals.org/conferences\\_and\\_events/upa\\_conference/2006/](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](mailto:dgeorgas@dp.uoa.gr) ,  
[http://www.erasmus.gr/dynamic/conventions.asp?conv\\_id=21r/dynamic/conventions.asp?conv\\_id=21](http://www.erasmus.gr/dynamic/conventions.asp?conv_id=21r/dynamic/conventions.asp?conv_id=21)

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

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

**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>

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

**October 15-19-2006** – Digital Avionics Systems Conference, Hilton Portland, Portland, OR  
<http://www.dasconline.org/>

**September 25-27, 2006** - 6th AIAA Aviation Technology, Integration and Operations Forum, Hyatt Regency Wichita, Wichita, KS <http://www.aiaa.org/content.cfm?pageid=1>

**October 23-25, 2006** – 44<sup>th</sup> 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/>

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

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

*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](mailto:bill.ctr.berger@faa.gov)

