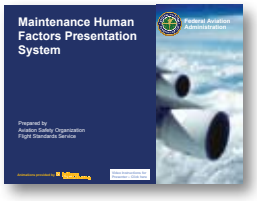
Maintenance Human Factors on DVD

Customizable presentation modules include videos, animations and a touch of humor to convey insights.



ELECTRONIC MEDIA

The FAA Maintenance Human Factors Presentation System (MHFPS)

Johnson, W.B.; Ciaccio, J.M. U.S. Federal Aviation Administration (FAA) Flight Standards Service and Chief Scientific and Technical Advisor Program. 2007. Available on DVD by e-mail request to several organizations.*

The Maintenance Human Factors Presentation System (MHFPS), distributed on DVD, serves as a teaching support tool for applied human factors training. While designed for maintenance, many of the messages are the generic and applicable to all aviation workers, from ramp personnel to flight crews.

The MHFPS comprises over 160 Microsoft PowerPoint slides. Embedded in the slides are 10 FAA video clips and 40 animations that were produced by Lufthansa Technical Training. The PowerPoint content can be organized and edited to meet user requirements. Most of the slides include additional presentation instructions in notes. The system is designed for users at all levels of human factors expertise.

Units of the MHFPS address topics including the history of human factors; human factors defined; the people-environment-actions-resources (PEAR) model for understanding and applying human factors principles; fatigue, error and event investigation; and sources of additional information. The MHFPS offers seven topical presentations or a blend of topics to meet short, medium and long time slots.

Examples of videos include "Counting Sleep" and "Human Factors Spectacles." The first video depicts a discussion about "how many hours did you sleep last night?" It uses light-hearted conversation to deliver the serious message that people typically overestimate sleep obtained and, too often, do not get enough. It suggests a 10-day program to count hours of sleep.

The "Spectacles" video suggests that all aviation workers must look at work and life situations with an eye to human factors. The message is delivered as the presenter views the audience and herself both with and without eyeglasses as a metaphor for human factors perspectives. In both videos, the messages are clear and memorable, designed with a bit of humor for easy consumption.

The MHFPS can be customized without restriction, permitting presenters to make the product a better fit for their own audiences. Additional slides can be added if the trainer chooses.

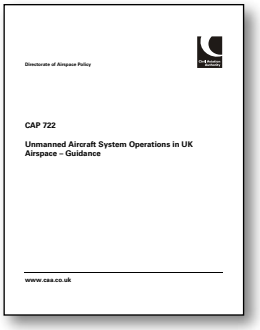
Also included on the MHFPS DVD are the FAA 2006 *Operator's Manual for Human Factors in Maintenance* and the FAA 2007 *Operator's Manual for Human Factors in Airport Services*.

The MHFPS is distributed at no cost by the Civil Aerospace Medical Institute in the United States, the Singapore Institute of Aerospace Engineers in the Asia-Pacific region and the International Federation of Airworthiness in the United Kingdom and Europe. Requests for the DVD should go to the organization that is closest geographically, as listed under "Sources."

REPORTS

Unmanned Aircraft System Operations in UK Airspace — Guidance

U.K. Civil Aviation Authority, Directorate of Airspace Policy. CAP 722. April 28, 2008. 92 pp. Figures, tables, references. Available via the Internet at <www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=415> or from The Stationery Office.**



This first revision of CAP 722 since November 2004 includes "major changes" on legal, certification, communication frequency spectrum and security issues. "With an ever-increasing number of manufacturers and operators, it is vital that the regulations keep pace with UAS [unmanned aircraft system] developments, without losing sight of the safety issues involved in the simultaneous operation of manned and unmanned aircraft," the document says.

The safety requirements that have to be met for UAS operation in the United Kingdom include both operational standards and airworthiness. CAP 722 intends "to assist those who are involved in the development of UAS to identify the route to certification."

Although UAS flights are currently limited to segregated airspace, "the ultimate aim is to develop a regulatory framework which will enable the full integration of UAS activities with manned aircraft operations throughout U.K. airspace," the publication says.

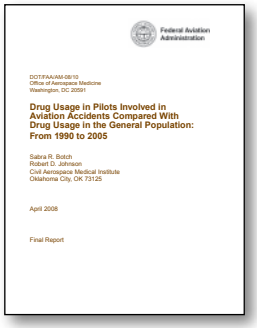
The traditional "see and avoid" principle for manned flight under visual flight rules is being adapted to "sense and avoid" for UAS. "Any proposed function must demonstrate at least equivalence with manned aircraft safety standards and, where these standards exist, the UAS must comply with the rules and obligations that apply to manned aircraft, including those applicable to separation and collision avoidance," the publication says.

The radar surveillance policy is that "UAS shall be able to interact with all other airspace users, regardless of the airspace or UAV [unmanned aerial vehicle] flight profile, in a manner that is transparent to all other airspace users and air navigation service providers, when compared to manned aircraft," the publication says. "UAVs shall be interoperable with all surveillance systems without any additional workload for aircraft controllers, surveillance systems, manned aircraft pilots or other UAV pilots. UAVs shall carry suitable equipment so as to be able to interact with aircraft equipped with mandated airborne collision avoidance systems such as TCAS [traffic-alert and collision avoidance system] II. Where a UAV employs a collision-avoidance system with reactive logic, any maneuver resulting from a perceived threat from another aircraft shall not reduce the effectiveness of a TCAS II resolution advisory maneuver from that aircraft."

For UASs with an aircraft component of greater than 150 kg (331 lb), airworthiness design and production standards will in general be the responsibility of the European Aviation Safety Agency. "Continuing airworthiness requirements, including maintenance, appropriate to each type of UAS issued with an airworthiness certificate will be in accordance with the requirements that currently apply to manned aircraft," the publication says.

Drug Usage in Pilots Involved in Aviation Accidents Compared With Drug Usage in the General Population: From 1990 to 2005

Botch, Sabra R.; Johnson, Robert D. U.S. Federal Aviation Administration (FAA) Office of Aerospace Medicine. DOT/FAA/AM-08/10. Final report. April 2008. 11 pp. Table, references. Available via the Internet at <www.faa.gov/library/reports/medical/oamtechreports/2000s/media/200810.pdf> or from the National Technical Information Service.***



Researchers at the FAA Civil Aerospace Medical Institute (CAMI) compared usage of illegal drugs and abuse-prone prescription medications among pilots involved in U.S. civil aviation accidents from 1990 to 2005 with that of the general population.

CAMI analyzes toxicological specimens collected from pilots involved in accidents. The study considered specimens from 5,321 pilots, 97 percent of whom were male. Of the total, 90 percent of specimens were from autopsies. The study examined accident pilot use of controlled substances such as marijuana, methamphetamine, cocaine and MDMA — known as "ecstasy." It also looked at use of anti-anxiety drugs, sedatives and painkillers.

Drug usage among the accident pilots was compared with data from the general population obtained from various federal agencies. The report did not differentiate between pilots in general aviation and commercial air transport.

"The occurrence of illicit and legal drugs in pilots involved in civil aviation accidents during the examined time period reflected that seen in the non-flying public," the report says. "There was a slight difference in the average age of the user, with pilots being slightly older on average than other drug users in the United States."

Among the pilots involved in aviation accidents, 467, or 9 percent, tested positive for either illicit drugs or commonly abused prescription drugs.

"As with the general population, the use of marijuana by pilots was far more prevalent than the use of all other illegal and prescription drugs," the report says. "In fact, marijuana was seen two times as often as the next most-used compound. Following marijuana use, the most often-used drugs were found to be opiates, benzodiazepines and cocaine."

Development of an Aeromedical Scientific Information System for Aviation Safety

Peterman, Connie L.; Rogers, Paul B.; Véronneau, Stephen J.H.; Whinnery, James E. U.S. Federal Aviation Administration (FAA) Office of Aerospace Medicine. DOT/FAA/AM-08/1. Final report. January 2008. 21 pp. Figures, tables, references, appendixes. Available via the Internet at <www.faa.gov/library/reports/medical/oamtechreports/2000s/media/200801.pdf > or from the National Technical Information Service.***

The Bioinformatics Research Team at the FAA Civil Aerospace Medical Institute (CAMI) created a scientific information system (SIS) to deal with the increasingly large government datasets on aviation incidents and accidents, as well as pilot medical certifications. "A knowledge discovery process was developed to consolidate different aviation data sources into a single dataset with a format more conducive to statistical analysis," the report says.

"One benefit of our SIS is that it will support epidemiological researchers in aviation safety studies who are not familiar with the underlying process of the dataflow, collection and storage. This system will support studies that examine the aviation safety and aeromedical aspects of certifying pilots with various pathological conditions. Finding patterns in the distribution of various pathologies in the mining of the electronic exam records of the U.S. pilot population is essential in any aviation epidemiological study."

The newly developed SIS synthesizes data from three major sources: the National Transportation Safety Board Aviation Accident Database, the FAA Accident/Incident Data System and the Airmen Registry pilot certificate component, plus several specialized aviation safety databases developed at CAMI.

The SIS turned up a surprise. The report says, "Examination of the counts of active airmen by year revealed an anomaly in the numbers of electronic medical certificates issued during the years 1994 through 1999. Roughly 50 percent of the electronic medical exam records in this time period omitted the medical class issued for the certificate. This caused a large dip in the count of active airmen for this time period."

Correcting the data resulted in the inclusion of an additional 1.4 million exam records of more than 425,000 pilots. "This inclusion of medical records, corrected solely by the determination of their correct historical medical class, had the effect of discovering additional accident records," the report says.

Analysis, Causality and Proof in Safety Investigations

Walker, Michael B. Australian Transport Safety Bureau (ATSB). AR-2007-053. March 11, 2008. 106 pp. Figures, tables, appendixes. Available via the Internet at <www.atsb.gov.au/publications/2008/AR2007053.aspx> or from ATSB.****

Determining, as far as possible, what happened in an accident or incident is only the first part of an investigation if it is to be useful in avoiding similar events. This report, an overview of the ATSB's newly developed investigation analysis framework, says that other aims are to

- "Determine the contributing safety factors (that is, how and why it happened);
- "Determine the safety issues that should be addressed; [and,]

- "Encourage or facilitate safety action by relevant organizations to address the identified safety issues."

The report's aims, it says, include providing "relevant background information concerning the purpose of safety investigations, the role of analysis, and an overview of the development and components of the ATSB analysis framework"; discussing "the new safety analysis terminology being used by the ATSB (such as 'contributing safety factor' and 'safety issue')"; providing "an overview of the ATSB analysis process" and "background information on concepts such as contribution (or causation) and 'standard of proof,' and how these concepts have been addressed in the ATSB analysis framework." Finally, the report "outlines concerns that have been expressed regarding the ATSB framework and similar approaches, and the ATSB consideration of these concerns."

The report explains why there had been a need for a new analysis framework: "Despite its importance, complexity and reliance on investigators' judgments, analysis has been a neglected area in terms of standards, guidance and training of investigators in most organizations that conduct safety investigations. Many investigators … seem to conduct analysis activities primarily using experience and intuition which is not based on, or guided by, a structured process. It also appears that much of the analysis is typically conducted while the investigation report is being written. As a result, the writing process can become inefficient, supporting arguments for findings may be weak or not clearly presented, and important factors can be missed."

To avoid such problems, the ATSB investigation analysis framework includes these elements:

- "Standardized terminology and definitions for analysis-related terms. This includes definitions for 'risk,' 'hazard' and 'safety,' as well as terms to describe events and conditions that increase safety risk ('safety factors'), the events and conditions that contributed to the development of an occurrence ('contributing safety factors') and the conditions that will have an influence on future safety unless addressed ('safety issues');
- "An accident development model. The ATSB 'investigation analysis model' incorporates an adaptation of the [James] Reason model of organizational accidents, and involves a set of functional questions to help identify potential safety factors";
- A defined process or workflow for conducting analysis activities. The process is divided into five main components: preliminary analysis, safety factors analysis, risk analysis, safety action development and analysis review"; [and,]
- "A set of tools in [the] Safety Investigation Information Management System [a new occurrence database] to guide and document analysis activities. These tools include a sequence of events list, safety factors list, risk analysis form and evidence tables."

WEB SITES

All Clear? <www.allclear.aero>

"All Clear? is part of the Air Ground Communication (AGC) Safety Improvement Initiative launched by the Eurocontrol Safety Team in 2004," the Web site says. "It builds on the recommendations and best practices presented in the AGC European Action Plan."

Communication problems are the most common cause of runway incursions and level busts — violations of altitude assignment — in Europe, according to the Web site. In response, Eurocontrol created a training tool kit for pilots, air traffic controllers and trainers to enhance radio communications skills.

The tool kit is the All Clear? Web site, comprising online training programs, downloadable documents and videos. All are free.

A 30-minute training module, consisting of a video with interactive exercises for controllers and pilots, addresses communications issues, risks of communication breakdown and possible solutions.

Videos about call sign confusion, blocked transmissions, radio discipline and loss of communication are accompanied by transcripts and self-study notes/reviews.

Some of the online documents are "European Action Plan for Air Ground Communications Safety"; "R/T [radiotelephony] Phraseology Manual," an ICAO standard phraseology reference guide for commercial air transport pilots operating in European airspace; and quick tips in the form of pocket guides for pilots and controllers.

A special section is devoted to helping airline and air traffic system trainers prepare and conduct training sessions using online resources, such as videos, handouts, presentations and other materials.

Flight Safety Foundation and four other industry organizations are listed as supporters of this AGC initiative.

"Hold Short for Runway Safety," <www.alpa.org/Default.aspx?tabid=3064>

The Air Line Pilots' Association, International (ALPA) says, "Through our new campaign, 'Hold Short for Runway Safety,' ALPA will focus its efforts on preventing runway incursions, excursions and confusion. We will provide you commonsense guidance that will help prevent operational breakdowns."

This runway safety Web site is not restricted to members. Posted materials, available free for online viewing, printing and downloading, include:

- *Online Runway Safety Education Program* — an interactive program "to help pilots avoid and prevent runway incursions by studying the various factors involved." The program uses graphics, sound and animation and takes 30–45 minutes to complete;
- *Runway Incursions: A Call for Action* — an ALPA White Paper (March 2007) containing statistics, tables, figures, appendixes and recommended readings;

- *Reducing Pilot Deviations* — a collection of educational FAA resources providing re-creations of air traffic control situations with embedded files of handouts, worksheets, presentations, fact sheets and other documents;
- *FAA Situational Awareness Through Airfield Signs & Air Traffic Control Instructions* — an animated, interactive quiz to help pilots assess their knowledge of airfield markings, signs and air traffic control instructions and maintain situational awareness while taxiing;
- Three runway incursion videos; and,
- Full text of ALPA's monthly "Runway Risks" newsletter. ●

Sources

* E-mail: Americas: <9-amc-aam-520-mmpi-2@faa.gov>; Asia: <exco@siae.org.sg> or <khso@cad.gov.hk>; Europe: <sec@ifairworthy.com>.

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**** Australian Transport Safety Bureau
P.O. Box 967
Civic Square ACT 2608 Australia
Internet: <www.atsb.gov.au>

— Rick Darby and Patricia Setze