

Royal Aeronautical Society Flight Simulation Group



Newsletter

May 2010

New Readers – please register as FSG members on the FSG website (<http://www.raes-fsg.org.uk/>) to ensure that you receive this newsletter via the FSG mailing list.

Editorial

This year sees the 40th anniversary of the formation of the committee representing flight simulation in the Royal Aeronautical Society. There are a number of remarkable aspects of this bold initiative:

- Several of the protagonists (who encountered considerable resistance from Society) still participate in Flight Simulation Group (FSG) committee activities.
- Flight simulation has come a long way from being viewed with considerable scepticism to becoming a vital aspect of civil and military operations.
- As flight simulation has spread throughout the world, the FSG has provided an international forum for the flight simulation community.
- Many of the issues raised back in the 1970s are still relevant today. Although there have been major changes in the technology of simulation, the issue of the effectiveness of training remains paramount.

Our Spring Conference, 'Flight Simulation Technology – 40th Anniversary of the First RAeS International Symposium', celebrates this progress.

David Allerton

Conferences and Seminars

The FSG now has a well established schedule of conferences and seminars, and well honed organisational procedures for handling them. The principal conferences are those held in the spring (May/June) and autumn (November). To ensure that these meet the evolving needs of the simulation industry, the Group monitors trends to anticipate future issues, and thus conference topics, and incorporates into these the results of external studies, such as the ICAO 9625 International Working Groups for Aeroplanes and Helicopters.

Planning for the 2011 events is well underway. The Spring conference will be titled *Simulating the Real Operating Environment (The world outside the cockpit)* to be held on June 8th and 9th, 2011 and will have the theme of "*what challenges need addressing in the fidelity of the simulation of the real world environment, or what's missing, that would improve the overall*

performance of flight simulator based training and development"?

The theme and dates for the Autumn Conference will be finalised at the FSG committee meeting on 8th June. The outcomes of ICATEE, whose work is described elsewhere in the Newsletter, are sure to feature in the discussions.

Flight simulation is not a stand-alone discipline, and increasingly complements or interacts with other aspects of aerospace. The FSG therefore supports the Society's annual Flight Crew Training Conference, and participates in those of other specialist groups where appropriate. An emerging area of multi-disciplinary interest is that of unmanned aerial systems (UAS); Mike Southworth's paper on UAS has stimulated debate within the Society, and it looks likely that this will be taken forward by a joint conference with the newly forming unmanned aerial vehicles (UAV) Specialist Group.

Gordon Woolley

Spring 2010 Flight Simulation Conference: *Flight Simulation Technology – 40th Anniversary of the First RAeS International Symposium, 9-10 June 2010.*

This informative and wide-ranging two-day Conference will examine flight simulation technology – the art and the science – from the perspectives of fixed-wing and rotary wing aircraft manufacturers and operators, makers and users of training systems, training providers, airspace managers, researchers, and regulators. The Conference has a very broad agenda and seeks both to ensure that appropriate work is taken forward and also to determine how the Royal Aeronautical Society might best facilitate progress.

The papers, some of which will be novel and contentious, will be presented by leading experts in their fields and some 150 delegates are expected from Europe, North and South America, the Middle East and Indian sub-continent, China and the Far East. Regardless of whether you are involved with management, manufacturing, training, regulating, airspace, or any other aspect of operations, this Conference provides a unique opportunity to engage in discussing the issues and influence the work required to resolve them.

The International Committee for Aviation Training in Extended Envelopes (ICATEE)

The FSG-sponsored ICATEE, studying the issues around upset recovery with the aim of proposing training and technical measures to overcome them, has made significant progress since its formation a year or so ago. It has allocated its deliberations to two main study groups, handling training and regulations, and research and technology. The next meeting, to be held over two days in London 7th-8th June 2010, aims to complete the training requirements matrix, define technical solutions for near-term needs, evaluate requirements for the long-term and define the potential regulatory issues that need to be addressed. It will then look at how to achieve these deliverables, including future meetings and the milestones to be met.

A variety of agencies and groups are pursuing parallel studies involving upset recovery issues, including the FAA Stalls/Stick-Pusher Group, the EASA 60-second Working Group, and the IATA Training and Qualification Initiative (ITQI). A number of members of ICATEE are also involved in these, and working to ensure that evidence and best practice are shared across all.

ICATEE's work will continue well into next year, but it is intended that recommendations to ICAO will be formulated by late 2011. Further information on ICATEE can be found on the Upset Recovery Forum on the FSG website.

Gordon Woolley

Edwin A Link Lecture, 10 June 2010

This year, the Ed Link lecture is scheduled to follow the Spring Conference. The lecture is open to everyone and is free to attend.

Steve Grinham, VP Training and Simulation from Thales will be presenting 'Why the Downturn is an Opportunity'. The Edwin A Link Lecture was established in 2007 to honour Edwin A Link, the distinguished pioneer of synthetic training. His remarkable foresight led to the creation of the Link Trainer, or 'Blue Box' as it came to be known, the precursor of today's powerful synthetic training devices, most notably full flight simulators.

Future Events

Merlin Flight Simulation Competition will be held at Coventry University on the 11th June 2010.

Captain Ray Jones Memorial Lecture

This lecture will be held on the 15th July 2010.

2010 International Flight Crew Training Conference: The Global Market Place: The Challenges of Flight Crew Training, will be held in London 22-23 September 2010.

RAeS 2010 Aerospace and Aviation Careers Fair will be held at the Society's headquarters on the 29th October 2010.

Autumn 2010 Flight Simulation Conference: The Challenges of Flight Simulation – The Next Steps, will be held on 17-18 November 2010.

Joint Cranfield/RAeS Flight Simulation Short Course

The annual short course *An Introduction to Flight Simulation*, jointly sponsored by the Flight Simulation Group and Cranfield University, will be held at Cranfield in the UK on 25-29 October 2010. Full details can be found at:

<http://www.cranfield.ac.uk/SOE/ShortCourses/ase/page3196.html>

The course aims to provide a structured and compact introduction to modern flight simulation technology and the application of flight simulators in civil and military training. It is international in scope.

Technology topics include flight and avionics systems modelling, motion systems and visual systems, database generation, rotary wing simulation and accident investigation using simulation. Human factors topics discussed include visual and motion perception and instructor and operator station design. Certification, regulation and standards in civil aviation, part-task trainers, the economics of simulator procurement and operation, financing methods and specific issues in military simulator procurement and defence simulation applications, including simulation interoperability, are also addressed.

Lectures are presented by academic staff of the School of Engineering at Cranfield University; members of the Flight Simulation Group, Royal Aeronautical Society; and practising specialists from organisations within the flight simulation industry.

The course is suitable for people from a range of backgrounds working (or planning to work) in the simulator industry, for members of national aviation authorities responsible for the effective use of simulators, for managers of simulation facilities and other operational staff, for those involved in simulator procurement in government agencies or in aviation organisations, and for anyone seeking an overview of modern flight simulation. While introducing the key technologies, the course does not deal in detail with the technical methods. It is relevant to military and civil aviation domains.

Barry Tomlinson

Universities Seminar

The second seminar for Universities was held at the Headquarters of the RAeS on the 20th May 2010. The meeting was attended by five members of the Flight Simulation Group committee and 9 delegates from the universities. The seminar includes talks on research activities by the universities of Liverpool, Sheffield and Cranfield. The meeting concluded with a lively discussion about the FSG Challenges.

David Allerton

Regulatory Affairs Update

National Qualification Requirements:

From 1st September 2009, JAR-FSTD (A or H) has been the sole means for the UK CAA qualification of FSTDs. With the cessation of the JAA, the European NAAs have agreed to continue the principles of mutual recognition.

European Aviation Safety Agency:

EASA have appointed Mr Jens Kruger as a FSTD Expert / Rulemaking Officer in the Flight Standards Department of the Rule Making Directorate and Mr Anders Vestgard as the FSTD Section Manager in the Flight Standards Department of the Certification Directorate. In addition, Mr Guy Schell has joined the Approvals and Standardisation Directorate.

Regulation 216/2008 sets the framework for the extension of EASA's remit to cover Operations, Personnel Licensing and third country aircraft.

The implementing rules (IRs) for Operations & Licensing contain the relevant 'parts' for device qualification and Organisation approval; Part Authority Requirements (AR) and Part Organisation Requirements (OR). The acceptable means of compliance (AMC), guidance material (GM) and the certification specifications (CSs), which are based on JAR-FSTD A & H, are contained within PART-AR and PART-OR.

The draft document was published for review in the form of NPA 22-2008 ((a) to (e)). The NPA is closed for comment and the review of the comment response document (CRD) is due to be completed by the end of June 2010 prior to being published in August 2010. The presentation to the commission is scheduled for February 2011 with publication sometime after.

The draft implementing rules for Air Operators and Community Operators has been published as NPA 2009-02 Part OPS. The closing date for comment has also passed and the CRD is due to be published in October 2010. The presentation to the commission is scheduled for April 2011 with publication sometime after.

Federal Aviation Administration:

As of May 30th 2008 14 CFR Part 60 became effective for FSTD initial (& continuing) qualification and use. The FAA is developing a process to initiate directives. Directive 1, which addresses visual airport model fidelity for training, testing and checking was published in change 1 to Part 60.

New Statements of Qualification (SOQ) are being issued for new FSTDs to meet Part 60 requirements. The SOQ includes a detailed configuration list and a list of qualified tasks.

Guidance bulletins published in 2009 include:

(09-01) - NSP Guidance on the Application of 'Non-Flight test' tolerances to Engineering Simulation Validation Data

(09-02) – draft – Visual Database Modelling Guidelines - Enhanced Taxiway Markings

(09-03) – Cockpit Ambient Lighting Requirements

(09-04) – Windshear Training and Simulator Requirements

(09-05) – FSTD Qualification for RNP/AR

Guidance bulletins published in 2010 include:

(10-01) – NVG Evaluation for Helicopter FSTDs

(10-02) – Request for Initial & Continuing Evaluation of a Level 4 or 5 FSTD

Peter Barrack

FSTD Standards

The Royal Aeronautical Society (RAeS) FSG has been leading an International Working Group (IWG) since early in 2006 aimed at providing technical standards for the whole range of Flight Simulation Training Devices (FSTD) for aeroplanes (IWG- A) and helicopters (IWG-H).

The IWG- A's output of their work, namely ICAO 9625 Rev 3, Manual of Criteria for qualification of FSTDs, Volume 1 fixed wing devices was published by ICAO in August 2009. The results were presented during the FSG November 2009 Conference, with representatives of ICAO and IATA present, in addition to IWG members.

The latest revision to the RAeS Flight Simulator Evaluation Handbooks, the 4th Edition of Volume 1, was also released at the FSG November Conference. This 4th Edition is a major expansion of the Handbook aligning the tests with the increased content of ICAO 9625 Revision 3. For the first time the Handbook also addresses Lower Order devices as well as the Full Flight Simulator evaluations

The activities of the IWG will continue past publication of the standards. Ongoing activities will include:

- (a) Completion of ICAO 9625 Volume 2 for rotary wing devices by the IWG-H Committee
- (b) Fixed Wing Volume 1 will have some studies and testing programmes to complete, e.g. Type 6 (and other) Device(s) definitions following MPL beta testing, the details of Frequency and Time criteria-based motion testing.
- (c) The Revision 3 Update to ICAO 9625 publication cycle has to be supported. It will receive post-publication and in-service comments that will need assessment and possible future recommendations to ICAO.
- (d) European and FAA regulations will need amendment to incorporate Revision 3 and a dialogue with these authorities will be needed past 2010.
- (e) The 'usual' advancement of technology will need to be kept under review e.g. ATC simulation.
- (f) Updating and maintaining the RAeS Flight Simulator Evaluation Handbook Volume 2, Functional and Subjective tests.

It was for these reasons that the 'International Committee on FSTD Qualification (ICFQ)' was formed to serve as an ongoing focus both nationally and internationally on behalf of the FSG for technical standards related to fixed and rotary wing training devices. The ICFQ is making progress in being recognised as a technical industry authority by EASA and several briefings have been given by ICFQ to EASA meetings in Cologne. The next ICFQ Meeting will be held at 4HP on Monday 7th June

The IWG-H activities are proving a more complex challenge than that for aeroplanes as the technical requirements and training methods are different and this will be the first document to formulate these standards. Completion of the results, the first draft document to describe rotary wing training standards, is estimated to take place at the end of 2010, with publication by ICAO occurring in 2011. Interim results will be presented at the Autumn 2010 Flight Simulation Conference.

The requirement to update the FSG Document "Data Package Requirements for Design and Performance Evaluation of Rotary Wing Synthetic Training Devices" following the IWG-H work is being reviewed.

Peter Tharp

Contact Us

We would welcome feedback on this newsletter and contributions for future editions. Please feel free to contact us via the FSG Forum <http://www.raes-fsg.org.uk/cgi-bin/yabb1/YaBB.pl>

The FSG Forum provides opportunities to contribute to discussions on the major challenges facing the simulation and training community. You will be welcome to contribute.

If you are aware of anyone who might like to receive a copy of this newsletter, can you please forward their email address?