



AN UNECESSARY SAFETY HAZARD ?

The Royal Aeronautical Society
International Working Group
Steering Committee.



Royal Aeronautical Society

Flight Simulation Group www.raes-fsg.org.uk



The Flight Simulation Group (FSG) is the specialist group of the Society which deals with the design, manufacture, installation and operation of simulation equipment and synthetic environments, and the economic and human factors which bear on the use of simulators for research and development and for civil and military flight crew training.

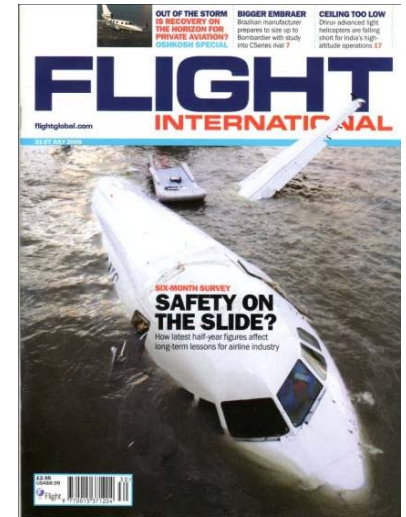
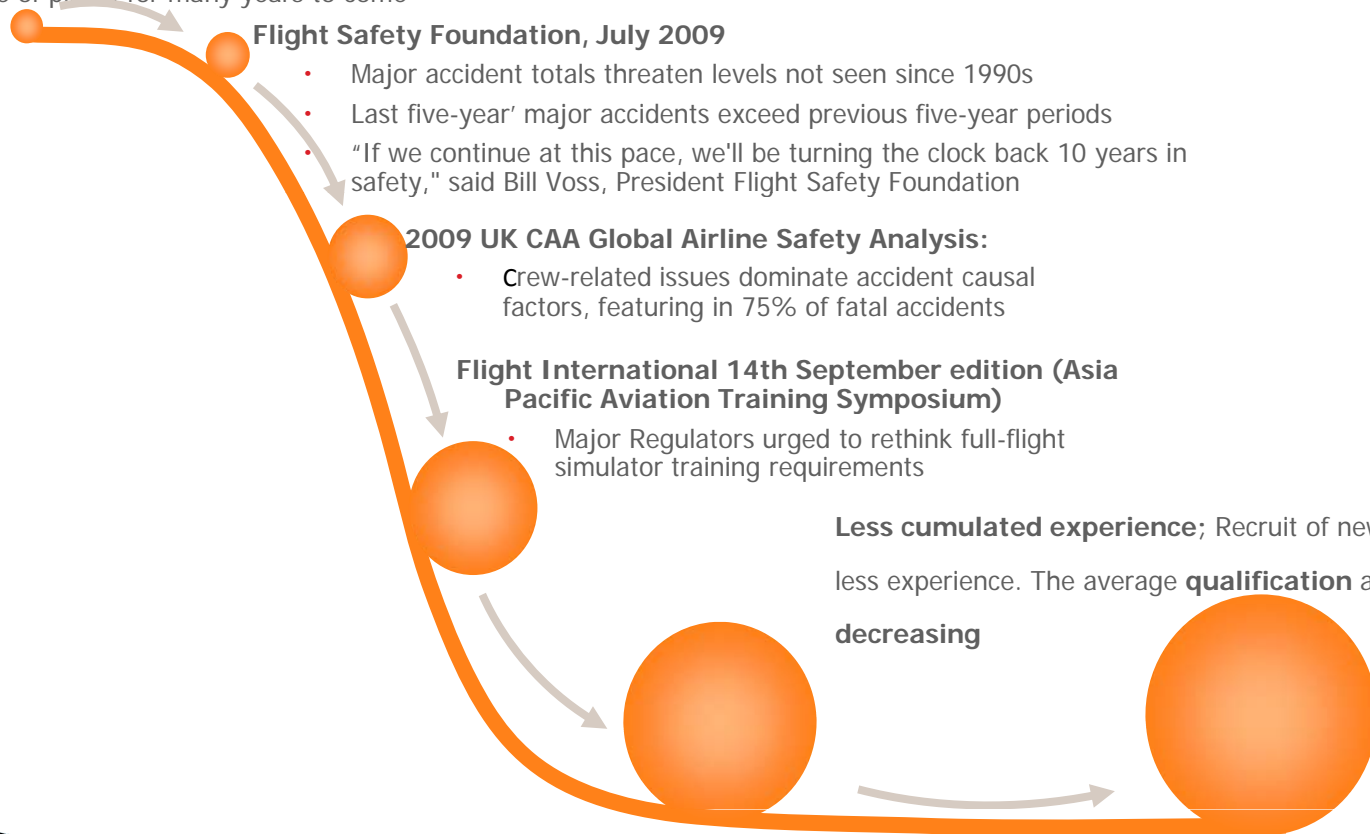
The Group maintains a significant international footprint and keeps abreast of flight simulation requirements in both civil and military areas worldwide, including the requirements of national and multinational civil regulatory authorities.

The FSG Committee ... *maintains a list of challenges facing the flight simulation community and seeks actively by all appropriate means to facilitate their progression... including leading an International Working Group on standards for flight simulation training devices.*



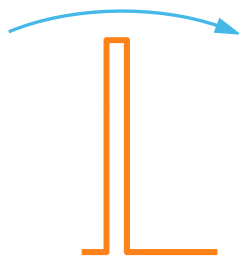
A Perfect Storm brewing?

Shortage; Short and Medium Haul airlines face a shortage of pilots, for many years to come



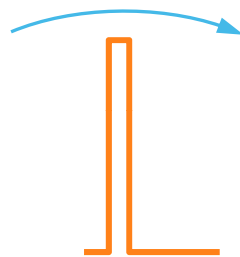
The costs and complexity of a classical FFS can represent major obstacles for airlines

Initial investment



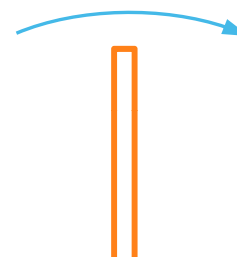
- Purchase cost of a FFS
- Difficulty to obtain a **financing** for simulators, which do not benefit from the same asset-backed solutions as aircraft
- **Large % of costs driven by aircraft OEM data package license fees and cost for instruments, parts and avionics**

Initial set-up



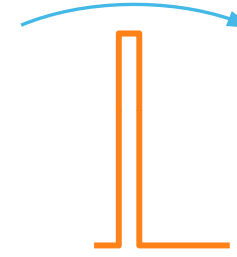
- **Long process:** manufacturing, shipping, set-up, certification = up to 2 years altogether
- **Expensive process:** need for a specific high ceiling building,.

Running costs



- **Maintenance cost:** Power and facility costs
- **Operating costs:** typically 3 full-time technicians are required (no economies of scale for airlines owning only one FFS)
- **Spares:** expensive aircraft parts

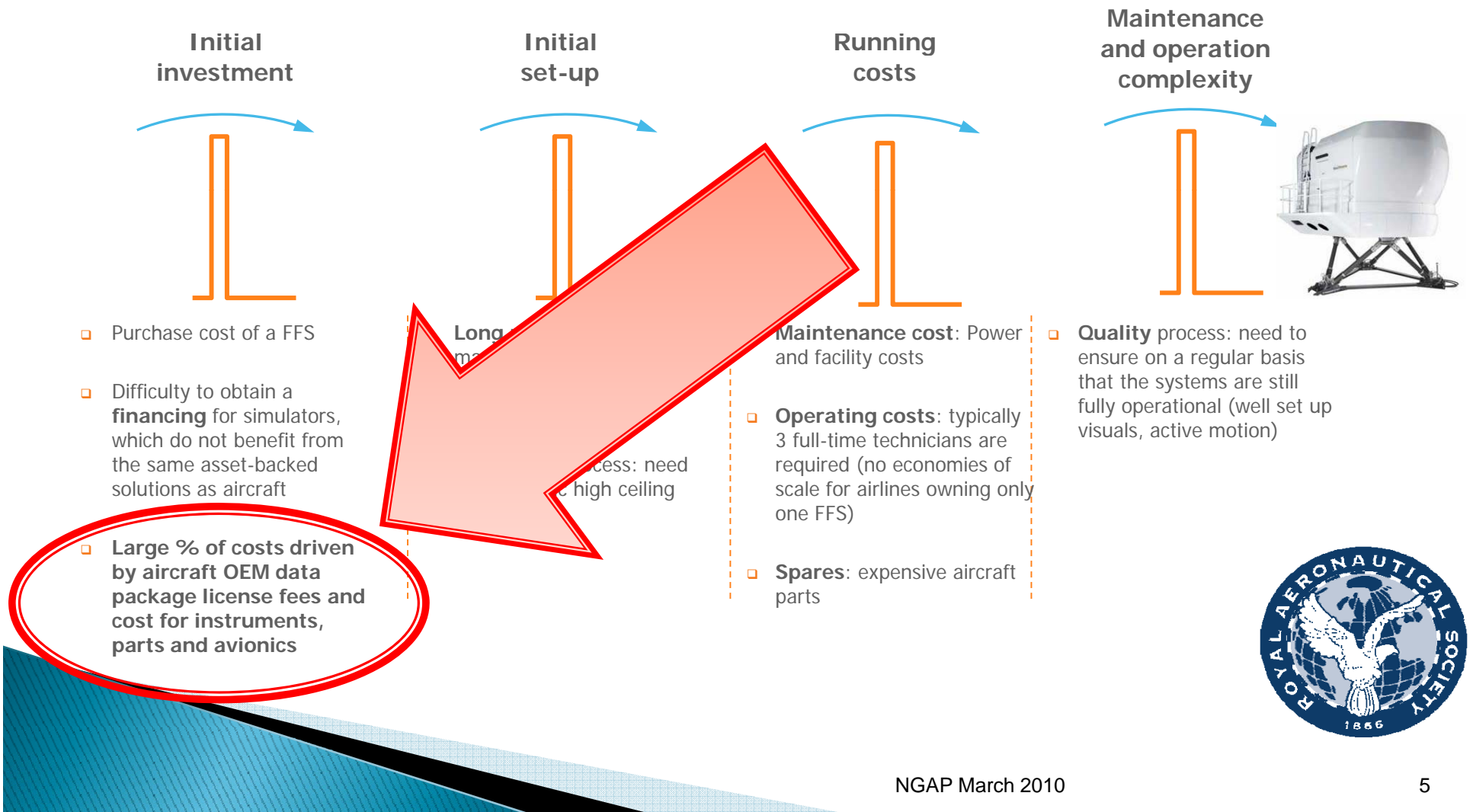
Maintenance and operation complexity



- **Quality process:** need to ensure on a regular basis that the systems are still fully operational (well set up visuals, active motion)



The costs and complexity of a classical FFS can represent major obstacles for airlines



Data Requirements



- ▶ Modern Aircrew Training relies on...
 - Use of Flight Simulation Training Devices (FSTDs)
 - Qualified and approved for training credits by National Aviation Authority (NAA) where FSTD is used as the alternative to training in the actual aircraft

- ▶ FSTDs thus require accurate design/check-out data
 - Mandated by the Regulatory Authorities,
 - Based upon
 - ICAO Document 9625 – Manual of Criteria for the Qualification of FSTD
 - Supported by
 - IATA Document Data for the Design & checkout of FSTD (Aeroplanes)



Data Provision



- ▶ Usually obtained from aircraft, avionics and other OEMs
 - Same data as used in
 - design of the aircraft
 - aircraft flight test program
 - Sold under license per FSTD
 - to Training Device Manufacturer (TDM)
 - to Operator with certain conditions & restrictions



Recent Changes



- ▶ 4th Generation commercial aircraft (B787,A350,...)
 - With more complex aircraft systems software being outsourced or produced by third party aircraft systems and avionics OEMs, the proportion of data needed, originating only from the aircraft manufacturer has decreased
- ▶ Sub-contracted airplane systems suppliers to the aircraft OEM sometimes lack understanding of simulation requirements **MAJOR ISSUE**
 - Understandable reluctance of OEMs to release data to potential competitors in avionics market
 - IPR (Intellectual Proprietary Rights)



Recent changes



▶ Cost of data

- Aircraft systems and avionics OEMs have started to charge for their data at much higher prices than previously.
- Between 1991 and 2006 data costs increased by 260%.
- Until recently data typically only represented 10% of FSTD price.
- Today this can be as much as 50% of the FSTD price and a new commercial aircraft data package can cost up to \$8 million



Commercial Issues

- ▶ Licensing of data and IPR is now seen as a key revenue earner
- ▶ Government Export Control restrictions
 - Transfer of technical data is often restricted if the receiving country is considered to be a security risk
- ▶ Alternative is to install actual aircraft boxes
 - Adds cost & compromises TDM's ability to integrate it effectively into simulated training environment

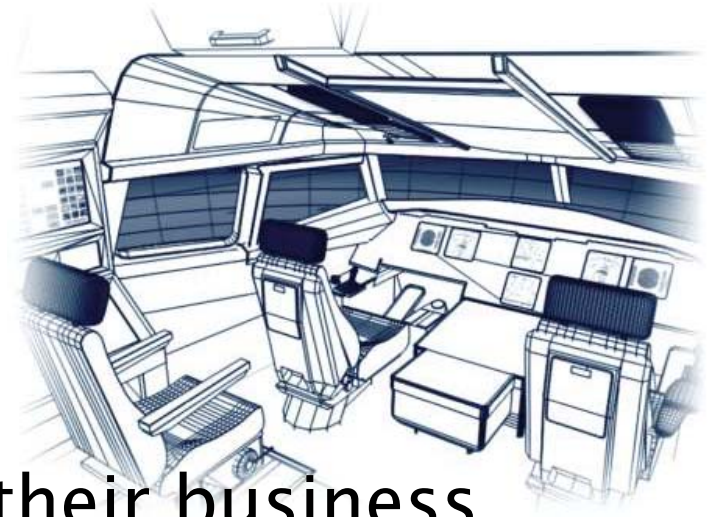


Commercial Issues – a recent example

- ▶ One OEM recently announced its new business model in supply of data for use in FSTDs
 - Operator/TDM sill purchases a data license
 - Any 3rd party benefiting by the use of that data should now pay an additional fee
 - e.g. FSTD updates may need an additional license from OEM if done by a 3rd party
 - e.g. Excess training capacity sold to 3rd party training organisations will attract a separate fee



A worrying trend?



- ▶ In the future will all OEMs base their business model on a principle that anyone using their intellectual property should be an income generator?
- ▶ Doesn't this ignore the fact that aircraft sales would be reduced if the training could not be carried out on FSTDs?



Why Are These Issues Important?

- ▶ Changes in pilot training
 - ▶ Additional costs come at a time when more training is seeking to be done on FSTDs as a result of recent tragic accidents highlighting the need for more recurrent pilot training
 - ▶ New training regimes such as MPL, ITQI
- ▶ Training needs to be affordable and accessible.
 - As crew “hands on” flying experience reduces, any actions that threaten that premise have to be strongly resisted.



Proposed Solutions

- ▶ International Agreement (through ICAO?)
 - Mandates aircraft OEMs to require all their avionic & engine OEM suppliers to commit to providing the required data as part of their contract with the aircraft OEM to incorporate their equipment in the aircraft
 - EASA NPA 2009–01 already provides for the provision of an “Operational Suitability Certificate” (OSC)



Summary



- ▶ As an industry we cannot ...
 - Let commercial business considerations adversely affect the availability and affordability of providing training to produce a competent pilot workforce thereby introducing a safety issue
 - Allow a potential return to the days of training in the real aircraft with the economic, environmental, safety and limited training potential that we fought so hard to overcome through the use of Flight Simulation technology.



Recommendation

- ▶ The message to you is that as an industry we must take some action or initiative to address the issues raised...
- ▶ ...or we face the consequences of reduced training availability to the pilot workforce with implications on safety performance and culture.

