

Flight Simulator Engineering & Maintenance Conference



2022 FSEMC Program

September 26-29
Las Colinas, Texas, USA

AN ARINC DOCUMENT

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August 16, 2022

***Please Print and Bring a Copy of this Program to the Meeting!
The Program will No Longer be Available at Registration.***

FSEMC Program

2022 FSEMC Sponsors

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FSEMC Program

To be recognized as the international authority on the Aviation Training Device industry. To enhance the safety and operational efficiency of aviation worldwide through the dissemination of engineering, maintenance, and associated technical information, including the development of consensus standards. To promote and advance the state of the art of the Aviation Training Device industry.

FSEMC Mission Statement



ARINC
INDUSTRY ACTIVITIES SM
A Program of SAE ITC

2022 FSEMC Program

Welcome to the 2022 FSEMC in Las Colinas, Texas, USA. This year's FSEMC is organized by ARINC Industry Activities, and we are certain that your attendance at the FSEMC will prove enlightening and beneficial.

The FSEMC Program is organized into two major sections. The general section contains the information that you need to get the most benefit from this unique aviation meeting. The FSEMC Discussion Items by Topic – the most important part of the program – presents 74 Discussion Items submitted by the simulator users and suppliers that will be discussed at the FSEMC.

FSEMC Reminders

The FSEMC Technology Workshop starts Monday September 26, 2022, at 1300, with a Welcome Reception starting at 1700.

The official Opening Session to the FSEMC is 0830 on Tuesday, September 27, 2022.

Please bring an up-to-date business card when you register. This information will be used in the attendance list in the FSEMC Report.

The FSEMC Program, including an updated list of attendees, is available at:

<https://www.aviation-ia.com/conferences/fsemc>

The FSEMC Steering Committee has decided that Business Casual is the appropriate dress for all FSEMC events.

FSEMC Program

Table of Contents

FSEMC SCHEDULE OF EVENTS	P-3
FSEMC TECHNOLOGY WORKSHOP	P-4
FSEMC OPENING SESSION	P-5
FSEMC INDUSTRY SESSION	P-6
FSEMC AWARDS	P-7
FSEMC KEYNOTE SPEAKER	P-11
FSEMC GUIDELINES	P-12
FSEMC HOSPITALITY AND SPONSORSHIP	P-16

2022 FSEMC Questions by Topic

	PAGE
DATA SIMULATION AND TRAINING	1
PRODUCT SUPPORT	5
VISUAL	12
STANDARDS OF TRAINING	14
INNOVATION IN SIMULATION	15
HOST COMPUTER	18
INSTRUCTOR STATION	20
SOFTWARE	21
MOTION	23
OTHER TRAINING	26
MISCELLANEOUS	27
AVIONICS	28
REGULATORY	30
OPERATOR CODES	36

2022 FSEMC Schedule of Events

Monday – September 26	
1100-1900	Early Registration
1300-1600	Technology Workshop
1700-1900	FSEMC Reception

Tuesday – September 27	
0730	Registration Opens
0830	Opening Session
0845	Keynote Presentation: <i>Lilium Presents: Innovative Air Mobility (IAM) – New Ways of Training</i>
0930	FSEMC Discussion
1000	Networking Break
1030	Presentation – <i>Weaving Digital Threads Through Courseware and Training Devices</i>
1110	FSEMC Discussion
1200	Lunch
1330	FSEMC Discussion
1410	Presentation – <i>Training Value of Extended Reality Systems</i>
1500	Break
1525	FSEMC Discussion
1600	Recess

Wednesday – September 28	
0730	Registration Opens
0830	Industry Session
1000	Networking Break
1030	Software Session
1120	Presentation – <i>PSCQ: Identifying the FSTD Configuration</i>
1200	Lunch
1330	FSEMC Discussion
1410	Presentation – <i>Evolution of Visual Systems and Solutions</i>
1500	Break
1525	FSEMC Discussion
1630	Recess

Thursday – September 29	
0730	Registration Opens
0830	Presentation – <i>Standardized FSTD Evaluations from the View of an Authority</i>
0900	Regulatory Session - FAA - EASA - Other NAAs
1000	Networking Break
1030	FSEMC Discussion
1120	Presentation – <i>Next Generation Approaches to Emergency Alternate Egress</i>
1200	Lunch
1330	FSEMC Discussion
1500	Break
1525	FSEMC Discussion
TBD	Open Q&A
1600	Adjourn

***Open Q&A Session** – Time permitting, on Thursday afternoon FSEMC will include an Open Q&A Session for 30 minutes prior to adjourning the meeting. This is intended to provide an open exchange of information. Since there is no question pre-notification, manufacturers may elect to simply accept an action to respond following the meeting.

Coffee Breaks

Coffee breaks will be provided daily at approximately 1000 and 1500.

2022 FSEMC Technology Workshop

Monday, September 26, 2022 – 1300-1600

The FSEMC Steering Committee will hold an open forum setting to discuss hot topics in the flight simulation industry.

Panel Participants (expected)	Topics	Place
CAE	FSTD Industry Resilience Through the Pandemic	Las Colinas Ballroom
Arnab Lahiri	Emerging Technology Issues Related to Training Devices that Need Addressing	
John Muller	Blockchain 101	

All participants are welcome to exchange a free flow of ideas and concerns, and to discuss implications of technology facing the industry today and in the near future.

2022 FSEMC Opening Session

Tuesday, September 27, 2022 – 0830

Welcome/Introductions

Eric Fuilla-Weishaupt
FSEMC Chairman
Airbus

Keynote Speaker

Andreas Pfisterer
Lilium

FSEMC Awards Introduction

Joshua Brooks
FSEMC Vice Chairman
FlightSafety International

Edwin A. Link Award

FSEMC Vice Chairman to present

Roger S. Goldberg Award

FSEMC Vice Chairman to present

Conference Announcements

FSEMC Chairman to present

2022 FSEMC Industry Session

Wednesday, September 28, 2022 – 0830

FSEMC Activities Update

Technology Workshop Review	Eric Fuilla-Weishaupt	Airbus
FSEMC Steering and Elections	Scott Smith	SAE ITC, ARINC IA
European FSTD Technical Group	Michael Schofield	Lufthansa Aviation Training
Emerging Technology	Marc Cronan	Collins Aerospace
	Shane Carroll	Airbus
Software Load Release WG	Derek Pratt	The Boeing Company

FSEMC Social Events

Conference Activities				
Date		Time	Event	Place
Monday	September 26	1700-1900	FSEMC Reception	Mandalay Ballroom
Tuesday	September 27	1730-2100 (Times are TBD)	RSi Visuals Reception	RSi Facilities

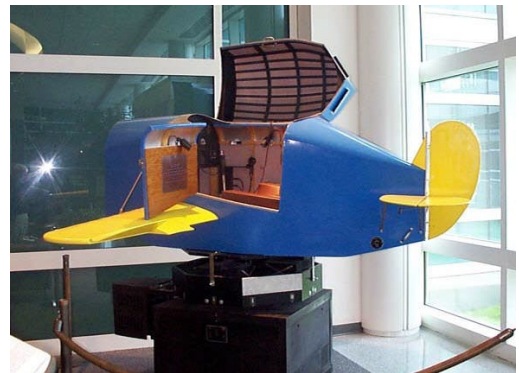
Edwin A. Link Award



"Ed" Link was born in 1904 in Huntington, Indiana, but moved in 1910 to Binghamton, New York, where his father purchased a bankrupt music firm. It was here Ed would begin and develop his career as (to quote his friend Harvey Roehl) a "backyard inventor in the finest American sense."

In his early twenties, at considerable expense and some risk, he obtained his pilot's license. While struggling to become a pilot, he began tinkering with parts of organs at his father's factory, trying to develop a training device so that pilots could start learning to fly safely and inexpensively without leaving the ground. Initially his trainer, although successful, was seen as a toy and relegated to the status of fairground ride.

In the mid-1930's, after a series of air accidents, the Army Air Corps ordered six of Link's instrument trainers to enhance its pilot training program. Once public attention had been drawn to this practical device, orders for more came from all over the world. Ultimately Link's invention led to the development of the whole field of flight simulation. With the help of his wife, Marion Clayton Link, whom he had married in 1931, Ed ran a highly successful enterprise, Link Aviation, Inc., throughout World War II and until he sold the company in 1954.



Thereafter Ed's skills and attention focused on underwater archaeology and exploration. In this, his wife Marion became his partner in research, and, with their two sons William Martin and Edwin Clayton, they undertook a number of voyages. During these years Ed worked constantly to improve diving equipment in order to allow divers to go deeper, stay longer underwater, explore more safely and efficiently, and return to the surface with less risk. On one of the sea voyages in 1973, during a routine dive in a submersible, the Links' younger son Clayton and his friend Albert Stover were killed. In a very moving statement to the press, Ed expressed his conviction that their death had not been in vain, but had identified problems that must be solved in order to meet the challenge of safer underwater exploration.

Mr. Link continued actively exploring, tinkering, writing, and generally enjoying his many interests until very shortly before his death in 1981. His was an unusually generous spirit: not only did he give tirelessly of his time and energy; he also donated financially too many foundations, scholarships, and charitable causes.

FSEMC is pleased to honor **Edwin A. Link** by selecting one individual each year for significant contribution in flight simulator support. On behalf of ARINC and FSEMC, we gratefully acknowledge and offer our thanks to the following individuals and organizations for their support of this award:

- Marilyn Link, Special Advisor, The Link Foundation
- The Link Foundation Board of Trustees
- L3 Communications' Link Simulation & Training
- Binghamton University
- Roberson Museum and Science Center

Edwin A. Link Award – Recipients



2019 – Utrecht, Netherlands
Mark Dransfield
Consultant



2018 – Dallas, Texas
Jim Takats
Takats Aerospace Group



2017 – Memphis, Tennessee
John Frasca, acc. Rudy



2016 – Hong Kong
Bernard Mattos
Airbus



2014 – Tulsa, Oklahoma
Itash Samani
CAE



2012 – Dallas, Texas
Jeff Everrett
RSI Visual Systems



2011 – Orlando, Florida
Joe Mays and Richard
Holmes
Barco



2010 – Brighton, England
Dr. David White
Thales



2009 – Cairo, Egypt
Craig Phillips
RSI Visual Systems



2008 – Salt Lake City, Utah
Andy Ramsden
Rockwell Collins



2007 – Montreal, Canada
Joe Biller
Link Simulation



2005 – Seattle, Washington
Jim Guvernator
Southwest Airlines



2004 – Tulsa, Oklahoma
Stuart N. Wilmott
CAE SimuFlite



2003 – Prague, Czech Rep
Dr. John Hunt
General Precision



2002 – Tampa, Florida
Kendall W. Neville
The Boeing Company



2001 – Atlanta, Georgia
Stuart Anderson
Evan and Sutherland



2000 – Toulouse, France
Joe Depaola
American Airlines



1999 – Denver, Colorado
Wolf Dieter-Hass
Lufthansa Flight Training

**Note: There was no Link Award recipient in 2006, 2013, 2015, 2020, or 2021.*

Roger S. Goldberg Award

The FSEMC Steering Committee gives an award each year to a special individual. It is an award for a person that has been extraordinary influence in the flight simulation industry, and has contributed significantly to the FSEMC. The award acknowledges these contributions with special recognition.

The first award was called the FSEMC Service Award. This first award was given to Roger S. Goldberg, posthumously, in recognition of the **Extraordinary ideas, Outstanding service, and Endless passion** he gave to our organization.

In his honor, the award is now named the



Roger S. Goldberg Award

Roger was a unique person in the way he had contact with other people. Always positive and happy, he made everyone feel good after being in his presence.

Roger was one of the cornerstones in the FSEMC Steering Committee. He was a founding member and an expert mediator, always searching for a better way or solution to move forward. He knew what he wanted and how he wanted the proceedings to go. Sometimes without the FSEMC Steering Committee even knowing, he was usually able to steer them positively in that direction. He was a great facilitator, fostering much discussion. He always stated, *It is your conference, and it is what you make of it.* He was an expert on encouraging people to work together, given their different backgrounds and experiences.

Roger S. Goldberg Award – Recipients



2019 – Utrecht, Netherlands
Mike Jackson
 FedEx, Retired



2018 – Irving, Texas
Nigel Sargent
 Alaska Airlines



2017 – Memphis, Tennessee
John Smith
 Asian ATR Training Center



2015 – Miami, Florida
Kip Caudrey
 The Boeing Company

**Note: There was no RSG recipient in 2016.*



2014 – Tulsa, Oklahoma
Shigeru Otomo
 All Nippon Airways



2013 – Tróia, Portugal
Alain Brault
 Airbus



2012 – Dallas, Texas
Sam Buckwalter
 ARINC Industry Activities



2010 – Brighton, England
Dieter Bunge
 Lufthansa Flight Training



2009 – Cairo, Egypt
Ted Weiss
 The Boeing Company



2008 – Salt Lake City, Utah
Lars Gran
 Oxford Aviation Academy



2007 – Montreal, Quebec
Bob Glenn
 The Boeing Company



2006 – Roger S. Goldberg
 ARINC Industry Activities
(Awarded Posthumously)

**Note: There was no RSG recipient in 2011, 2016, 2020, or 2021.*

FSEMC Program

2022 FSEMC Keynote

IAM – New Ways of Training

**By: Andreas Pfisterer, Lilium
Head of Operations and
Flight Crew Training, Test Pilot**



Andreas Pfisterer leads the development of Flight Operations and Crew Training at Lilium GmbH in Munich (Germany).

Currently he is also supporting the flight test campaign as base manager and test pilot for the Lilium prototype in Spain. His background is more than 30 years in commercial operation with Swissair and in Business Aviation, as Pilot, Instructor and in various Top Management functions, as well as Flight Inspector at Swiss FOCA, responsible for certification and oversight of commercial airline operation.

Abstract

Advanced Air Mobility (AAM) or Innovative Air Mobility (IAM) with all its various VTOL aircraft and with its worldwide footprint is launching a new era of aviation and with this new era comes a huge demand for VTOL pilots to safely fly passenger and cargo across global markets.

We are at a changing point in aviation. We must look at this new industry as a clean sheet approach and opportunity for pilot training and training systems. The amount of pilots to be trained will require the industry to push for new training tools, technologies, and methodologies to shift the training towards being more affordable and scalable while keeping safety at the highest priority for the unique challenges of Innovative Air Mobility.

Yes, there are plans in the market to have the VTOL aircraft transition to fully autonomous, but this might be a long term goal because of technology issues, regulatory concerns, and public acceptance.

Until autonomous operation of hundreds and thousands of vehicles above and between cities will become reality, the industry will create thousands of jobs. It is our challenge to crew these aircraft with suitably qualified pilots using the most efficient training system.

This presentation will give some insights into Lilium, to the type of operation and the relevant challenges that will need to be solved on our way to type certification, focusing on pilot training, including innovative training devices and qualification strategy.

FSEMC Program

2022 FSEMC Guidelines

Scope

FSEMC includes users of flight and cabin training devices (dynamic and static). Users include airlines, commuter airlines, training centers, military, and other simulation users. Participants include airframe manufacturers, aircraft equipment suppliers, Training Device Manufacturers (TDM), and simulator equipment suppliers.

Background

The FSEMC is organized by ARINC Industry Activities to assist aviation interests in cooperating to develop shared technical solutions and to establish technical standards.

FSEMC seeks to reduce life-cycle costs, as well as to improve the operation of flight simulators and training devices by promoting reliability, better maintenance; support techniques through the exchange of engineering, maintenance, and associated technical information; and the development of voluntary technical standards related to simulation and training. FSEMC also seeks to promote and advance the state of the art of the flight simulation and training industry to the mutual benefit of its members.

Attended by more than 300 flight simulator experts from around the world, the annual conference identifies technical solutions to engineering and maintenance issues and as a result of this synergy, the airline industry benefits immensely.

Agenda

This program is the main document for the FSEMC. It is published several weeks in advance of the meeting and disseminated to all interested parties. **The program is also incorporated into the FSEMC App, which can be download from your app store.**

Paper Copies – The program will no longer be available at registration.

FSEMC Report and Presentations

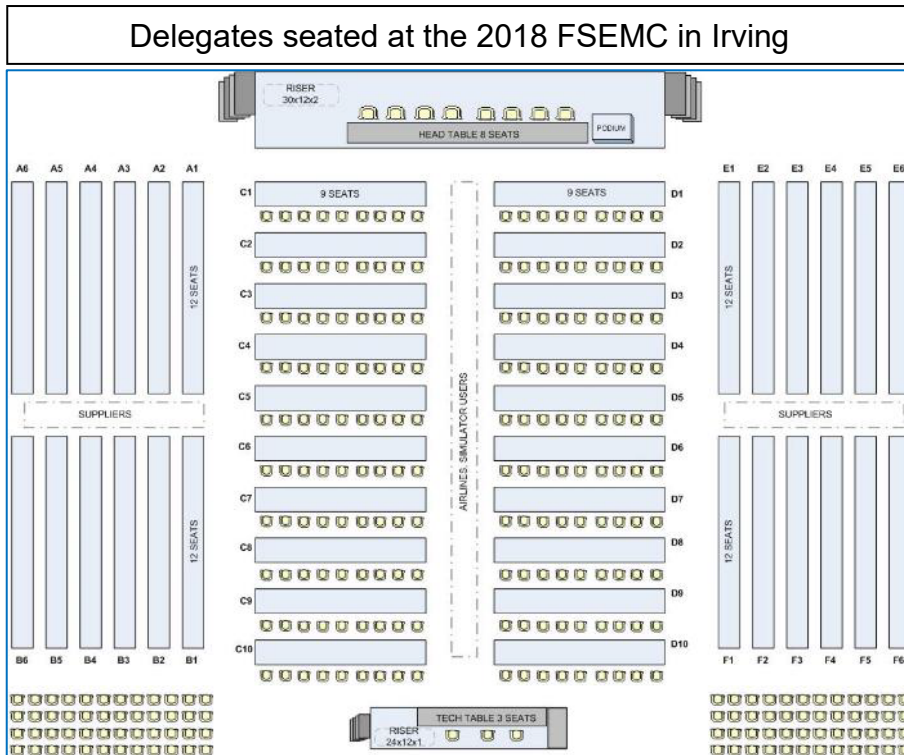
An FSEMC Report will be prepared following the meeting. The FSEMC Report and Presentations will be available at no cost to FSEMC Members and Associate Members. For all others, a nominal fee will be charged to download the report and presentations from the FSEMC web site at:

<https://www.aviation-ia.com/product-categories/fsemc-meeting-reports-and-presentations>

FSEMC Program

Seating

Airlines and other simulator users are seated in the center section of the meeting room. Manufacturers, suppliers, and others who are involved in responding to discussion items are seated in the wings of the meeting room.



The 2018 FSEMC, hosted by RSi Visual Systems, was held in Irving, Texas. The 24th annual meeting was attended by simulator user organizations, supplier companies, airframe manufacturers, simulator manufacturers, and Regulatory Authorities.

The total registered attendance was 316 attendees from 30 countries.



FSEMC Program

Promptness and Courtesy

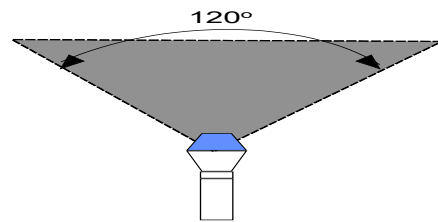
- Please be prompt for the start of each session. Pay careful attention to the start times published in the FSEMC Schedule of Events.
- Persons arriving late for the FSEMC Opening Session are asked to refrain from entering the ballroom during keynote remarks.
- Persons with mobile phones are requested to turn off the ringers for these devices during the meeting sessions. Use of these devices is not permitted in the conference meeting room. Please conduct phone calls outside the conference during the scheduled breaks.



Meeting Conduct

Anyone wishing to comment on a discussion item or raise a question during the discussions please observe the following procedure:

1. Hold up the place marker to obtain the microphone. Wait to be recognized by the moderator.
2. When recognized by the moderator, state your name and organization.
3. Speak clearly and distinctly into the microphone.



The Conference Microphone System is activated by pressing the button on the base of the microphone unit. The microphone will illuminate a red ring on the “stalk” when activated. The person speaking should be 8 to 20 inches away from the microphone stalk and within the shaded area in the diagram. When finished speaking, pressing the button on the base will deactivate the microphone, and the red ring light will extinguish. The microphones on the floor stands are similar, except the button is on the actual microphone. **Queue up in a line at the floor stands to expedite the discussion.**

If a microphone is left open (red light illuminated) without a person speaking into it, please press the button to turn off the microphone unit. This will prevent unwanted sounds in the audio system and allow other speakers to be heard clearly.

Manufacturers are requested to follow the agenda when a discussion item they are planning to answer is being introduced and to move to a microphone so as to be ready to respond. This will significantly help to keep the meeting flowing smoothly.

Language and Terminology – The FSEMC is conducted in the English language. Since English is not the native language for many FSEMC participants, please keep the use of slang, vernacular, or colloquial expressions to a minimum and speak slowly. If something

FSEMC Program

is said that you do not understand, please wave your hand and the moderator will ask the speaker to repeat the comment.

FSEMC discussions typically generate a large amount of technical jargon and acronyms. Please keep the use of acronyms to a minimum. Use only widely accepted acronyms. For example, INS is generally well known as the acronym for the Inertial Navigation System; however, GBL is probably not used to denote Gyro Bearing Lubricant in many organizations.

Since the FSEMC is all about communication and is an international meeting, the FSEMC Steering Committee encourages all attendees to participate.



The person sitting next to you at the FSEMC may have that one bit of magic information that will solve your problem or offer a new perspective. Take time to meet that person, listen to what they have to say, and thank them for participating.



The moderators take additional care to ensure the use of these guidelines. Participants are encouraged to inform the moderator if you do not understand the discussion due to a language barrier.

For cases where the moderator feels that the question or response is not clear, the moderator will ask the respondent to repeat the response more slowly. In addition, manufacturers should be willing to restate a question to ensure a clear understanding for everyone.

Discussion Item Procedure

- The moderator will direct your attention to each new item number. If the question is complex, a brief summary will be made.
- When it appears that a group of operators have similar problems, the moderator may ask for a show of hands to avoid redundant comments and to expedite discussion.
- Those making comments are urged to be brief.
- A copy of written responses should be given to the FSEMC Executive Secretary.
- If solutions must be worked out after the conference, please send a copy of the appropriate documentation to the FSEMC Executive Secretary.

NOTE: For delegates that are not native English speakers, a written response may be given to the moderator at the beginning of each day for entry into the record.

Information from Manufacturers

New information related to improvements to existing equipment or new designs may be of interest to users. Manufacturers who may wish to include such information in FSEMC discussions are asked to make prior arrangements with the Chairman. Manufacturers are also asked to concentrate on technical aspects of the information. Any tone of a *sales pitch* is highly discouraged during presentations or FSEMC discussions.

FSEMC Program

2022 FSEMC Hospitality and Sponsorship

FSEMC Shared Hosts

The 2022 FSEMC offers a unique opportunity for taking part in hosting the FSEMC. In recognition of the conference hosts, each company brand will be promoted on our website, the conference banner, in our mobile app, during the conference, and in the meeting report.

FSEMC Showcase and Welcome Reception

The FSEMC Showcase and Reception is planned for 1700 until 1900 Monday evening, leaving you plenty of time to enjoy the nightlife of the city. The Showcase and Reception will be held in the Mandalay Ballroom.

Networking Refreshment Breaks

Coffee breaks will be provided at 1000 and 1500. These networking breaks are meant to allow sufficient time for conference attendees to meet with other industry professionals.

Refreshments during the morning and afternoon breaks are provided by break sponsoring organizations. Morning and afternoon refreshments include regular coffee, decaffeinated coffee, tea, water, and a small snack.

Break sponsors receive recognition in our Mobile App and on our web site. Additionally, break sponsors may give a short presentation or provide a video just before the break release.

Lunch

As a convenience to the attendees and to avoid any unnecessary delays in returning to the conference, a buffet style lunch is possible through lunch sponsoring organizations.

Lunch sponsors receive recognition on our web site, during the event itself, in our mobile app, and during the conference. Lunch sponsors may also provide a video to be played during the lunch break.

Lunch will be provided at 1200 Tuesday and Wednesday.

FSEMC Evening Events

Evening Events will be planned based on the level of sponsorship funding available. Evening Event sponsors receive recognition on our web site, during the event itself, on the mobile app, and during the conference.

If you would like further information on joining the sponsors of the FSEMC, please contact Vanessa Mastros at vanessa.mastros@sae-itc.org.

FSEMC Program

2022 FSEMC Hospitality and Sponsorship

FSEMC Showcase

The FSEMC Showcase will be held on Monday, September 26, 2022, from 1700 to 1900.

FSEMC Daytime Exhibits

Daytime Exhibits will be located in Mandalay Ballroom throughout the conference. Exhibits will be open and operational during refreshment breaks, lunch, and the Monday Evening Showcase.

Organizations who wish to secure an exhibit space for the week, or an exhibit space for the FSEMC Showcase, should contact Vanessa Mastros at vanessa.mastros@sae-itc.org.

FSEMC Shipping

FSEMC has selected EAS Exhibition Services as the official freight carrier for the handling of ground and air shipments, as well as storage, delivery, pickup, and reshipment of materials.

For further information, please contact:

Paula Collaco
Account Manager
EAS Exhibition Services
647-203-8520
paulacollaco@rogers.com

DATA AND SIMULATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
01	Simulation Software Package	Alternative Data Sources	All	All	All	All	USAF

Our aircraft fleet is undergoing propulsion system modifications that significantly change performance and handling characteristics. We have determined a new aerodynamic model is required. Flight test data for flight certification has been gathered, but no data was collected for aero model development. It is our intent to develop a new model under the provision of "Alternative Data Sources" in part 60. This will combine a small amount of the data (20% or so) from the flight test effort with our current model which will then be refined with SME subjective tuning. Has anyone else done this? If so what are your lessons learned? What Level were you able to get your FSS qualified to? Are there any training limitations on your device(s)?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
02	Simulator Software Package	TCAS	All	All	2019	A330	FIJI

A330 STD 2.6 does not include any TCAS malfunctions, only available with T2CAS. We have had writes ups from Regulator during Initial and Recurrent Evaluations stating that there is a significant need for this type of malfunction. This was previously available in earlier Standards.

Are other operators facing this issue?

Is it possible to get TCAS malfunctions included into A330 STD 2.6 devices?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
03	Engines Degradation Effects in Icing Conditions	Engines	All	All	All	All	CAE

As part of the FAA FSTD Qualification Standards for Extended Envelope and Adverse Weather Event Training (EET), the corresponding engine and airframe ice accretion models are to be evaluated against the modeling and training requirements defined in NSP GB 11-04.

However, given that aircraft OEM engine icing models are not always readily available and/or simulates degradation effects which can differ from those expected by certain operators (particularly those involved in the design and/or tuning of engine icing models provided prior to the EET) can pose a challenge to Training Device Manufacturers (TDMs).

Points of discussions:

1. Guidance from aircraft OEMs on how to simulate/standardize engine degradation effects in all potential icing conditions

DATA AND SIMULATION

2. Guidelines on if and how TDMs should support subjective tuning of engine icing model degradation effects (e.g. permanent damage, stall, N1 fluctuations, etc.) without being substantiated with actual aircraft data

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
04	Simulation Software Package	Weather Modelling	All	All	All	All	FDX

FSTD Weather Modelling - Evolving Storm Models: Would it be possible to request a presentation, by TDMs and/or OEMs, regarding any weather model improvements under development? What features are being investigated? Do TDMs/OEMs need input from operators on prioritization of feature development?

An example would be the existing FSTD storm cells functionality when demonstrating current and future WxR functionality. FSTD storm cells are currently static models without any convective evolution.

- Is there any support/requirement/need, among operators, TDM's and regulatory authorities, on the development and implementation of evolving storms?
- Are OEMs or TDMs actively developing enhancements such as these?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
05	Aero Data Research	Flight Dynamics	All	All	All	All	MSC

Due to the large increase world-wide of forest fires, are training centers seeing an increase of training for fire-fighting aircraft specific training?

This requires often specific data and a past FSEMC had a presentation on the CL-415 simulator project. That simulator now has been in use for a number of years.

C-130, Dash 8-400, Boeing 757, and Airbus A400M are all new specific aircrafts that are being modified for this activity.

The shift in Center-of-Gravity (CG) during pick up and release of water are an area of simulation that require very specific data.



Sharing of data and experience will provide safe and reliable training.

Discussion - Operators, TDMs, OEMs, and others:

DATA AND SIMULATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
06	Roll Rate Issues		Std 3.0	Sim international Airbus	2020	A330-200	FIN

Finnair uses Sim International's fully rebuilt std 3.0 A330-200 FFS. This simulator has significant Roll handling problems which have yet to be resolved with the manufacturer and Airbus (Roll overshoot and delay).

When stopping the roll rate input from the sidestick, the roll continues longer than expected, resulting in pilot induced oscillations and unstable approaches.

Some background on the subject:

All MQTG tests pass.

Several scenarios run at Airbus platform and results close to Finnair Simulator results.

Analyses did not allow identifying any problem on SIM International simulator.

Airbus Data package 2.6 and 3.0 do not allow the simulator manufacturer's tuning roll parameters.

What is the experience of other A330-200 with Airbus Std 2.6 or 3.0 training device operators?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
07	SOQA						FSI

SOQA Toolsets are being integrated into training devices on a limited basis across the industry.

Are there any operators willing to discuss their experiences, and are they interested in expansion of such toolsets?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
08	SCQ Working Group		All	All	All	All	FSEMC

FSEMC sponsored the Simulator Continuing Qualifications (SCQ) Working Group. The group has made good progress and published Draft 1 of **ARINC Project Paper 449: Optimizing Simulator Continuing Qualification using Profile Testing** proving the value of Alternate Means of Compliance in lieu of conventional QTGs.

The draft document provides guidance for recurrent qualification of Flight Training Devices (FTD) using Optimal Combination Inputs (OCI). The guidance is intended to represent an Alternate Means of Compliance (AMC) for qualification to meet regulatory requirements.

There was a fair amount of industry backing in the 2016-2020 timeframe, but with world events the work has stagnated. Refinement, testing, and proof of concept are essential next steps to the project.

- What is the industry's interest in continuing this project?
- Who is interested in leading the working group?

DATA AND SIMULATION

- Are there any operators interesting in participating in the proof of concept?

Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
09	FSTD CAB	Experience using RollOn-RollOff Cockpits in Different Locations	All	All	All	All	LAT

Do other operators have experience in exchanging RollOn-RollOff (RoRo) cockpits between different locations, meaning in different training centers, maybe even in different countries?

Is there a proven strategy to overcome potential risks?

(e.g., transport damage & insurance, customs & export control, regulatory and qualification aspects)

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
10	Simulator Improvements and Implementation	Full Flight Simulator	All	CAE	2022	MAX9	ASA

During our installation of new simulators there have been a number of modifications that improve systems or help with maintenance. Often we are not made aware of these changes. Some were added in automatically and some we were told about that were not implemented.

For end users with older sims of the same generation how do the TDMs communicate that these new modifications are available?

Example, 599 heat extractor, 599 power supply rails extension, EMM Simulator EPO shunt trip breaker

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
11	Obsolescence Issues	USB IO	PS428466015842	CAE	2014-2016	737-900	ASA

The USB_IOs went obsolete with no “last-time-buy” option from the TDM. There was only one End-Of-Life (EOL) bulletin. What are the TDMs going to do in the future to mitigate this situation?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
12	Obsolescence Issues	USB IO SBC	PS428466015842	CAE	2014-2016	737-900	ASA

The USB_IO SBCs are obsolete and have no suitable sub at the moment from the TDM. Is there a plan to find a suitable sub? The original manufacturer was KONTRON.

PRODUCT SUPPORT

Have any other end users found either a suitable sub or repair center for these?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
13	MPIC Temperature Monitoring	MPICs and OneUI	All	CAE	2022	MAX9	ASA

In the past, OneUI would display the temperature of the MPICs. On our latest sims this is no longer the case. Can the TDM explain why this important info is no longer displayed?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
14	A220 Parts Supply		All	All	All	A220	LAT

For A220 simulators, there is no possibility of a pooling / exchange in advance / loan agreement with Airbus as they do not allow the installation of an A/C part after repair into an aircraft when it has been used in a simulator before. Lufthansa Technik and Spairliners for example in general do not offer pooling of A220 parts.

How do other operators handle the supply of original aircraft parts for their A220 simulators?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
15	Additive Manufacturing	Central Knowledge Base	All	All	All	All	LAT

Additive manufacturing (or 3D printing) is a great way of producing all sorts of components, for the flight deck but even more so outside the flight deck for example in the NSA and other areas of an FSTD.

Apart from initial production by the TDM, it can be used to re-manufacture components for legacy simulators that would otherwise not be available anymore, from pushbuttons to linings, in plastics or even metal alloys.

It can also be used to produce modification parts that improve the maintainability and operability of any FSTD.

Is there an interest in the industry to create a common shared knowledge base to share the designs and CAD files available in the community?

The TDMs could share data for current or legacy simulators, while FSTD operators could do the same with what they have created themselves to solve issues or improve their FSTDs locally.

Open source software under GPL can be seen as a positive example for such a setup of shared knowledge. Export control topics must be managed actively.

Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
16	Third Party Component Obsolescence	Technical Documentation	All	All	All	All	LAT

We are experiencing increasing numbers of cases in which a certain component is obsolete, or only a few are left on stock, where these components are neither manufactured by the TDMs themselves nor are they COTS parts that could be replaced by a more modern equivalent.

In these cases, the parts (e.g., electronic boards) are to interface certain avionics components, specifically manufactured by a 3rd party supplier. The TDMs seem to struggle with requests about remanufacturing those parts, because they did not receive or secure technical documentation about the components (electrical drawings, chipset/IC programming, CAD drawings, etc.) that could be used to outsource their production once again to restock, or even provide them to a simulator operator for a local restock activity with their preferred production partner.

Are the TDMs willing to secure pro-actively the required information about critical components from their suppliers of older FSTD products as well as current ones?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
17	Proactive Obsolescence Management		All	All	All	All	LAT

It happens more and more often that when we send parts for repair, they are no longer repairable and also no corresponding spare part is available anymore. There was also no FSB or last buy notification.

What are the plans and processes of TDM to improve this to make the customer proactively aware of this?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
18	Cabinet Overheating	MPIC	7000XR	CAE	2019	737MAX	FIJI

Cabinets A199 and A399 suffer from overheating. We believe this is a design issue.

Are other operators experiencing this?

Is there an FSB to address this issue?

Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
19	Trim System Checks	B737 MAX Stab Trim Force Check	All	All	2019	737MAX	FIJI

There is a new requirement to check Stab Trim forces annually to ensure they are maintained in accordance with EASA AD 2021-0039R2 / Boeing SDB-737-006.

Are other operators setting up these checks manually?

Is there an automated test set up that can be added?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
20	Supply Chain Issues Caused by the Pandemic	All	All	All	All	All	CAE

Question to OEMs.

What are the issues faced by operators with the lack/missing parts worldwide and increase in price of raw material on their operation?

1. How do you meet customer expectations with supply chain diversification?
2. Do you have enough stock or how do you manage stock when demand is increasing or when a part breaks?
3. How do you navigate with unexpected challenges?
4. How do you anticipate manufacturing and supplier delays?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
21	KPI Metrics		All	All	All	All	IFTC

How do FSTD Operators monitor their simulator performance Key Performance Indicators (KPI)?

Are ARINC 433 defined parameters enough or are there any other KPIs which helps for monitoring simulator performance

Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
22	Obsolescence Issues		Multiple	Multiple	All	All	FDX

Like many other organizations in the FSTD industry, FedEx has a need for components, piece parts, and interfaces that have become obsolete and are unavailable through the usual channels.

<u>Part Number</u>	<u>Description</u>	<u>Part Number</u>	<u>Description</u>
MA180132-01	WXR Interface Card	MA180080-01	ALS, Interfaces with Audio control panel
101102.02.269	Central Warning logic card (P1 Cabinet)	MA180080-02	ALS, Fuel Flow Indication
DV-27-021	IOS Visual Control Panel Button/Switch	Quadview QVXL 4/0/2	Quadview XL Video Mixer 4 Input-2 Outputs
MA180176-02 Rev A/1	Y-1 Card	Quadview QVXL 4/4/2	Quadview XL Mixer RGB, Composite, S-Video x 4, DVI x 2 Output
MA180176-02 Rev A/2	Y-1 Card	Omron NT31C-ST143B-EV3	P1 interactive touch display screen
MA180176-02 Rev A/4	Y-1 Card	P47009A01	Combo
MA110443-01	EICAS N2/N3 Driver	P47007A01	Fiber Optic Datalink; FODL
MA110440-01	EICAS N1 Driver		

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
23	Inadvertent Input	DCP-2120	822-3252-101	CAE	2019	737-8 MAX	CATC

We have had a problem with MINS switches on both Display Control Panels DCP-2120 (BSP Boeing/Rockwell Collins).

The switches had an unnormal movement of inner (smaller) knob. It was probably a mechanical issue. The switch was not going to the middle/neutral position itself (when it was released) and the MINS changing never stopped until the switch was placed manually perfectly to the center. It was not possible to properly tune in BARO or RADIO minimums during the training.



Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
24	Turn Around Time	Any Rotable Parts	All	CAE	All	All	CAL

The standard repair parts turn-around time is 3 months, some complicated cases will take more than 3 months.

Would it be possible takes the “in advance exchange (but no more in advance exchanged fees)” method instead of repairing the original parts to meet the deadline of turn- around time?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
25	QTG Script Editor	Application	All	CAE L3 Harris	All	All	CAL

Could TDMs can offer the QTG scripts editor application for simple adding some comments (like the local authorization suggested comments during the re-current authorized) by the customer?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
26	Supply Chain and Obsolescence						LAT

In which ways have TDMs and Hardware Equipment suppliers adapted their strategies to deal with the supply chain issues of the last years for new FSTD parts and sustainment parts?

Have these supply chain issues been an obsolescence and, possibly, a longer duration AOG catalyst?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
27	Obsolescence						FSI

Obsolescence has been a hot topic over the past few years. The Pandemic has aggravated the situation through supply chain delays, and 3rd parties not being able to deliver goods in a timely manner.

TDM's are left scrambling around in an effort to expedite procurement, while operators bear the cost of lost time in many cases.

Can operators comment on what they are doing at the local levels to combat obsolescence and general supply unavailability?

Discussion - Operators, TDMs, OEMs, and others:

PRODUCT SUPPORT

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
28	737NG Control Wheel	Aileron Gear Box Assy	MA164755102264	CAE	1998	737-700 737-800	Boeing

Boeing has two CAE 737NG simulators of similar vintage that are exhibiting play in the control wheel.

Attempts to adjust have been futile. CAE has indicated that all upper and lower (CAE manufactured) gears need replacement.

Have other operators of CAE simulators experienced similar control wheel gear wear?

Discussion - Operators, TDMs, OEMs, and others:

VISUAL

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
29	Visual Mylar Mirror Reskin	Visual Mylar Mirror	All	Collins Aerospace	2019	All	ANA

ANA has encountered Mylar Mirror broken issue, and it spent 7 times mirror reskinning. (reskin failed 6 times.).

- Q1. Are there any operators who had similar issue which is reskinning attempt so many times?
- Q2. TDM recommends mirror vacuum pump must be powered all time, are there any operators who cannot obey that due to local electrical law? (i.e., periodical electric plant maintenance requirement with all power off in Japan)
- Q3. If there are some customers who correspond above Q2, how do they treat mirror maintenance at that time?
- Q4. Do you have any special operation to maintain Mylar Mirror?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
30	Visual Mylar Mirror Reskin	Visual Mylar Mirror	All	Collins Aerospace	2019	All	ANA

ANA would like to know any experience when you encounter Mylar Mirror broken & reskinning is required.

Mylar mirror can't be repaired & needs to reskin to fully recover, but mirror cell must be removed in order to reskin the Mylar.

And Mirror cell should be placed on the floor in order to reskin. ANA doesn't have required space (9m x 7.5m) around FFS bay.

So we have taken the mirror cell to another warehouse with wall door removing, that means huge cost.

- For customer: Are there any customers who cannot prepare required floor space (9m x 7.5m) around FFS bay?
- For customer: Are there any customers who has similar experience and/or problem? Do you have any solution to avoid these difficulties?
- For TDM: Do you have any solution to reskinning without removing mirror cell or required floor space?
- For TDM: Mirror should be more durable, do you have any solution and/or new products?

Other operator and supplier comments, please.

Discussion - Operators, TDMs, OEMs, and others:

VISUAL

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
31	Visual Systems	Projectors	All	Sony Barco	All	All	CSTPL

Can we discuss projectors not giving six foot-lamberts (06 FL) after refurbishment which is regulatory requirement?

For example, a recently refurbished Sony GH10 and also a Barco FL-35 failed this requirement after approximately 10K hours during FSTD operation. This does not meet manufacturer’s specification of 50K hours.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
32	Aerobridge Lighting	Cabin Traffic Light	ACE	CAE	All	All	FIJI

The CAE Airport Clutter Editor (ACE) does not allow the changing of the bridge cabin traffic light. Whenever we add a new gate, light is red and cannot be changed locally.

It is required to be referred back to CAE for change.

We receive calls from users during training asking for light to be changed.

It would be more efficient for all if this change could be included in ACE and done locally.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
33	Visual	Projector	Sony VPL GH10	Sony	2000		MSC

The Sony VPL GH10 projectors went obsolete about 10 years ago.

They are still being used on some simulators and is anyone capable of repairing these projectors?

Any feedback would be appreciated!

Discussion - Operators, TDMs, OEMs, and others:

STANDARDS/TRAINING

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
34	FFS FTD Preflight Check	FFS/FTD	All	All	All	B6/B7/B8 /A32/A38 /Q4	ANA

ANA’s FFS & FTDs are currently implementing following pre-flight (PF) checks to prevent flight training interruptions,

PF1 : Electrical power cycling, data re-loading and actual full flight check (T/O ~ CRZ ~ LDG), which is done with every 72 hour intervals.

PF2 : Cockpit switch position check, light check, and visual condition check and cleaning, which is done with every 24 hour intervals.

PF3 : Electrical power cycling, data re-loading, which is done only for B787 FFS/FTDs with every 24 hour intervals.

ANA would like to know if other airlines FFS/FTDs carry out effective PF check before flight. If so, please let us know the details and its intervals.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
35	SATCE		All	All	All	All	FSEMC

SATCE is settling into the industry and training environment now. Have we hit the mark?

We would like to hear operator comments regarding utilization of SATCE and its success and/or shortcomings. Do we have more work to do in this arena?

The FSEMC prepared, adopted, and published **ARINC Specification 439B: Simulated Air Traffic Control Environments in Flight Simulation Training Devices** in 2020. Has this standard met the needs of the FSTD industry?

Discussion - Operators, TDMs, OEMs, and others:

INNOVATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
36	Artificial Intelligence		All	All	All	All	LAT

How to ensure resources and Know-How required for AI and machine-learning based training tools

Several products are currently in development that suggest to use Machine-Learning-algorithms and Artificial Intelligence to support the instructor, or even completely relieve the instructor of some tasks (e.g. grading of certain maneuvers and competencies).

Flying an aircraft is a complex system resulting in many parameters, factors and dependencies, thus instructor's tasks are not easy to be represented by algorithms and AI.

In order to get mature algorithms and an AI that can be trusted, a vast amount of training data is required. This must be combined with aircraft specific procedures and real-life instructor experience to apply successful reinforced learning of the algorithms.

The resources required for this process may be quite exponential, and specific know-how may not always be available to a TDM or 3rd party supplier producing such AI-based instructor product.

Also, the training data is not necessarily available in the required amount or quality.

Once the challenge is mastered to convince pilots and unions of collection of de-personalized data, a commonly used and open data format and (ideally) industry-wide database would be beneficial. Are the TDMs in the lead to create such common and open data format?

Do the aircraft OEMs have an interest in being heavily involved in "teaching" the algorithms, with aircraft specific procedures and their own data sets like flight test data or FDM? Is it beneficial to the industry to have OEMs in the lead instead of individual TDMs?

Of particular interest would be the regulator's opinions.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
37	Cross Reality – Virtual, Augmented, Mixed	XR Qualification via Regulatory	All	All	All	All	USAF

VR/AR or XR system as an FTD under Part 60.

Has anyone qualified or is attempting to qualify a VR/AR or XR system as an FTD under Part 60 (or other host nation standard). If so, could you describe your approach and methods?

Discussion - Operators, TDMs, OEMs, and others:

INNOVATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
38	Unmanned Training		All	All	All	All	MSC

Various airlines and FSTD operators are using drones in their operation.

FlightSafety International mentioned a few years ago that they are providing drone training (presentation at an FSEMC).

Are other users now providing drone training?

Is this a topic that the FSEMC steering committee should pursue?

Users please comment



Discussion - Operators, TDMs, OEMs, and others:

INNOVATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
39	Emerging Tech Applications		All	All	All	All	FSI

Industry is working diligently to figure out which of the emerging technologies will benefit pilot training most, and how to leverage those technologies in an effective and efficient manner.

Do the operators have a "Wish List" of items they would like to see the suppliers working toward? What is your desired future state of the art?

Discussion - Operators, TDMs, OEMs, and others:

HOST COMPUTER AND PERIPHERALS

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
40	Cold and Warm Start Time	Software	NIL	CAE	2015	A350	CAL

It takes too much time for cold or warm start (re-boot) and loading simulator after our simulator updated to the Airbus STD. 1.2, would it be possible to improve this situation?

If cold start will take about 55 minutes. (Especially waiting for the FSANG ready)

If warm start will take about 45 minutes. (Especially waiting for the FSANG ready)

If just ONLY loading simulator, it will take about 25 minutes.

Our system is 7000 R4 A350 Airbus Std1.2 and using the Drop Load A35x12_7_2_14_1.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
41	One UI Reliability	Software	NIL	CAE	2015	A350	CAL

The SBCs(Single Board Computers) shown the “abnormally loaded” message on the Launchpad after between the two configurations is changed every time. Could TDM explain the reasons or offer some suggestions to avoid this situation?

Our system is 7000 R4 A350 Airbus Std1.2 and using the Drop Load A35x12_7_2_14_1.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
42	One UI Reliability	Application	NIL	CAE	2015	A350	CAL

There are always too many errors messages (especially for software platform(platformmgr.exe)) shown on the One UI application but actually it does not affect to the training.

So it becomes unreliable and turns into an invaluable tool, would it be possible to improve this situation?

Our system is 7000 R4 A350 Airbus Std1.2 and using the Drop Load A35x12_7_2_14_1.

Discussion - Operators, TDMs, OEMs, and others:

HOST COMPUTER AND PERIPHERALS

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
43	CAE Re-Hosted FMS	XPMC Board	CAE/PM-150039	CAE	2008	747	Boeing

Boeing has a CAE 747-400/-8f/-8i convertible simulator with a re-hosted FMS. The re-host PC's PSU failed and took out its XPMC boards.

CAE has not been able to supply replacements. Do any operators at the conference know where any of these XPMC boards with Uboot operating system (Not VXworks) can be located?

Discussion - Operators, TDMs, OEMs, and others:

INSTRUCTOR STATION

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
44	R7 IOS Arm Vibration	IOS Station	L3 Harris		2020 2022	A350 787	LAT

The level of vibration at the Reality Seven IOS Screens (specially the upper one) and IOS Mount, given the geometry of the arm used to hold it, can be excessively large, especially in turbulence, buffeting and UPRT. LAT is concerned about fatigue cracks eventually leading to premature fractures at the structure.

LAT would like to ask other RealitySeven device operators about local modifications they have implemented to reduce the level of vibration at the IOS arm/ IOS mount.

Discussion - Operators, TDMs, OEMs, and others:

SOFTWARE

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
45	Simulation Software Package	Software Release Compatibility with Modified Hardware	All	All	All	All	CLX

Assuming a TDM has delivered several simulators of the same type that get supported by common software load release.

What will happen if on one simulator an obsolete hardware component needs to be replaced with new hardware that would render the simulator incompatible with the current and future software load release?

Will the TDM provide tailored software load release to that particular simulator?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
46	Simulation Software Package	Lifetime Support with Software Release	All	All	All	All	CLX

Can TDMs guarantee that they will provide software load releases until the end of the lifetime of a FSTD?

We regard 20 years as a typical lifetime of a full-flight simulator, but certain devices may be in operation for up to 30 years.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
47	QTG/VDR Changes		All	All	All	All	FSEMC

How do operators tackle frequent QTG changes after software load release and update in master QTG?

Discussion - Operators, TDMs, OEMs, Regulators, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
48	Simulator Software Package	QTG Changes	All	CAE	2019	737MAX	FIJI

QTG changes are not visible on the software load releases unless further changes are done with the Product and Project files by CAE.

Are other operators facing this issue when validating loads?

Discussion - Operators, TDMs, OEMs, and others:

SOFTWARE

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
49	Training Product Load			CAE	2019	737MAX 320NEO	CATC

CAE currently releases the new version of Training Product Load several times a year.

Does CAE plan or intend to deliver these updates for new simulators as a "difference" updates and not as a complete installation?

It is about the size of the downloaded and/or transferred data, where the complete installation is 8-10 GB in size, while the differential update could be possibly in the order of hundreds of MB.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
50	Software Load Release	Software	NIL	CAE	2015	A350	CAL

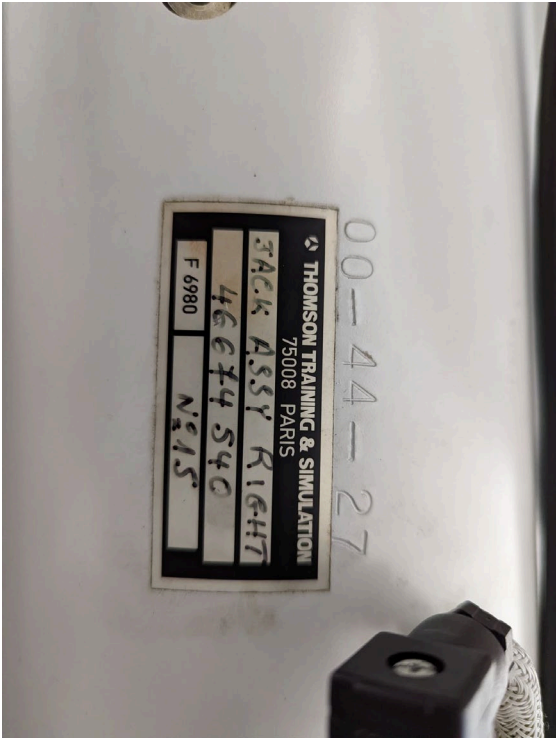
We notice every software load release version seems like it was not fully tested by the TDM. And also we believe each version is released too frequently, would it be possible to improve this situation?

Discussion - Operators, TDMs, OEMs, and others:

MOTION AND CONTROL LOADING

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
51	Used Motion Legs source	Motion Legs	46674540	Thomson/L3	2003	737-800	ASA

Our L3 simulator Motion legs are no longer made or available. PT# 46674540AA00. Are there any end users who have any extra legs or are replacing theirs with a different system that would be willing to sell ASA one to three legs?



Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
52	CAE Motion 600 System Noise Issue	Motion Jack Assembly	PS250956-17	CAE	All	All	LAT

The motion makes a startling noise during fast stroke and load changes of the motion jacks. The noise cannot be localized at a single point. There is also a perceptible jolt in the entire system of the return lines.

There is no interference with the training and motion QTG results.

Oil temp and pressure are within the recommended range. No related warnings or failures are present.

So far the following parts have been changed without positive results:

MOTION AND CONTROL LOADING

- HPU cartridge insert check valve PS250956-17
- Hydraulic servo valves of jacks 1-6 PS24449201

Has anybody experienced similar issues?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
53	Obsolete Parts	Electrical Amplifier Unit	EAU 96052	Fokker	1999	All	ASA

The Fokker Electrical Load units used by Thales/Thompson/L3 in the early 2000s used a component called "Electrical Amplifier Unit", EAU 96052. This unit is obsolete, and not supported by L3 or Fokker.

- Does anyone know of a supply of these devices?
- Does anyone know who might still be using these Fokker Load units?



Discussion - Operators, TDMs, OEMs, and others:

MOTION AND CONTROL LOADING

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
54	Motion Actuator Removal Procedure	Motion System	All	All	All	All	MSC

In the last few years there have been a few instances of simulators slowly falling over during a maintenance session to repair an actuator.

Can all sim manufacturers and motion manufacturers provide the correct and recommended procedure for to remove an actuator for maintenance?

If possible, please provide for hydraulic and electrical motion systems. Written responses are preferred.

This to prevent simulator damage and potential INJURIES to maintenance personnel and therefore a safety issue.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
55	Motion Hydraulic Oil	FFS	Shell Naturelle HF-E68	L3H E-M2K	All	787	ANA

L3H E-M2K Motion System requires using the Shell NATURELLE HF-E68 hydraulic oil.

We experienced that the total acid value increases very quickly and exceeds the controlled value (4.25 mgKOH/g) in about two years after the replacement with the new oil.

- Q1, What are the possible causes of such a rapid deterioration in total acid?
- Q2, Have other customers reported similar problems?
- Q3, How often do you replace HF-E68 with the new oil?
- Q4, If there are any measures that have been effective in preventing the progression of deterioration, we would like to know. (Annual operating hours of the device would also be very helpful information.)

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
56	Motion Hydraulic Oil	FFS	Shell Naturelle HF-E68	L3H E-M2K	All	787	ANA

We have received an information from oil supplier in Japan that Shell NATURELLE HF-E68 was being discontinued on the market. So, we contacted to L3H and they advised us that the NATURELLE S2 HF-68 could be used as an alternative. Unfortunately, this oil has almost no demand in Japan and the supplier does not have it in stock, ANA has considerable difficulty in obtaining.

- Is it possible to select a more readily available mineral oil alternative to S2 HF-68 oil?
- Does any Operator have an experience in selecting alternative oil to replace Shell NATURELLE HF-E68 on your own?

Discussion - Operators, TDMs, OEMs, and others:

OTHER TRAINING DEVICES

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
57	Lower Level Device Application		All	All	All	All	FSI

Requests for FTD level equipment has seen a significant increase over the past few years. Do the operators expect this trend to continue into the future?

Using FAA referenced levels, are you finding the Level 4-5 devices to be more beneficial, or would you see Level 6-7 devices taking the advantage in your training programs? (Similarly, EASA designated levels will have the same question).

What training tasks have been successfully offloaded from the FFS into these lower-level device types?

Are there tasks that have been offloaded, but found to be more effective training in the FFS?

How can TDMs make these devices more valuable to the training operation moving forward, while keeping them in the cost-effective solution space?

Discussion - Operators, TDMs, OEMs, and others:

MISCELLANEOUS - FLIGHT SIMULATOR SYSTEMS

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
58	Simulator Support		All	All	All	All	Boeing

What programs other than traditional summer internship programs have simulator operators and TDM's used for developing a pipeline of simulator technicians and engineers for their organizations?

Discussion - Operators, TDMs, OEMs, and others:

AVIONICS

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
59	5G Training	Avionics	All	All	All	All	MSC

A lot of time and energy has been spent reporting 5G issues in the media.

Have users had to implement a 5G malfunction to help pilots identify and cope with the potential 5G interference and the radio altitude effects?

If yes have aircraft OEMs been able to support users in creating these malfunctions?

How has it affected safety and training?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
60	ATR NPU	Avionics	82425-00-SM60	Honeywell	1990s	ATR42 ATR72	MSC

We have seen 2 clients in the last 2 years have encountered issues with their Navigation Processor Unit (NPU) and could not have a spare NPU ready for to keep training running smoothly.

The ATR NPU required re-programming with a simulator software setup. The NPU is needed for repositioning and keep flight performance data operational for navigational purposes. Honeywell had no quoted repairing older NPUs and the clients were left no other option than potentially updating their simulator.

Honeywell response required.

Sharing of experience will provide reliable training and hopefully prevent unintended extended downtime.

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
61	UPRT Training	Stick Shaker	All	All	All	All	MSC

Are training centers seeing an increase of stick shakers being broken?

On various types of simulators, we are seeing a more than normal amount of broken stick shakers and this can cause downtime and influence training.

Discussion - Operators, TDMs, OEMs, and others:

AVIONICS

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
62	787 TAWS Database	TAWS Database	Collins Aerospace	Boeing	2022	787	LAT

LAT has until now mostly been dealing with Terrain Databases for Honeywell EGPWS, with a known release rhythm of every 2 AIRAC Cycles. The way Collins Aerospace deals with 787 TAWS Databases, in particular for Simulators, is new territory for LAT; there is no published release schedule; the update frequency seems to be of “about a year” but may be less or more; operators could profit from an online and speedier purchasing and delivery process.

A bit of research shows Collins has been asked at the Aviation Maintenance Conference (AMC) by 787 airplane operators concerning the 787 TAWS Databases topic in years 2019, 2020, 2021, 2022. From AMC 2022 Q49, it seems Collins and Boeing agreed to release 3 TAWS databases per year (one yearly and two off-cycle versions) for the 787 aircraft.

- Can Collins publish a schedule release for 787 TAWS Databases for Simulators?
- Is Collins considering multiple yearly releases of TAWS Databases for Simulators?
- Is Collins considering any changes to the purchasing process and delivery process for 787 TAWS Databases?

Reference <https://www.aviation-ia.com/product-categories/amc-meeting-reports-and-presentations> :

- 2019 AMC Discussion Item 173 from UAL
- 2020 AMC Discussion Item 099 from UAL
- 2021 AMC Discussion Item 035 from UAL
- 2022 AMC Discussion Item 049 from KLM

Discussion - Operators, TDMs, OEMs, and others:

REGULATORY

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
63	Regulatory Retrospective		All	All	All	All	Boeing

Retrospective on implementation of UPRT/EET, qualifications, training, etc.

As a broad industry retrospective, can operators, TDMs, OEMs, and regulators comment on how the implementation of UPRT/EET, qualification, and training/use has gone. What has worked well, what could have been improved, lessons learned, any outstanding issues or struggles? If it was to be done again, what would you change?

Discussion - Operators, TDMs, OEMs, and others:

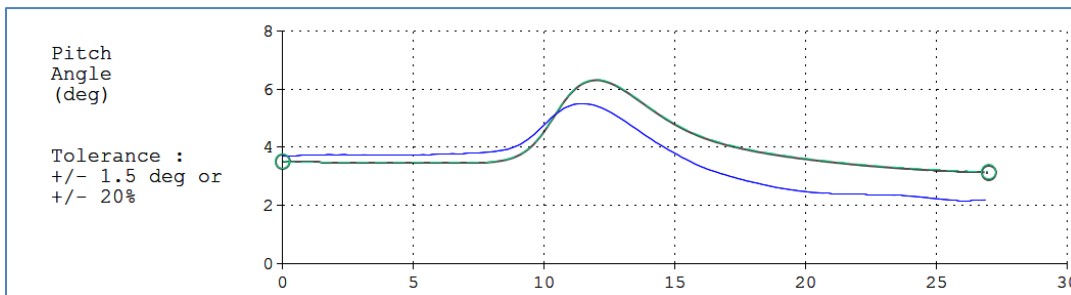
<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
64	FFS QTG - MQTG		All	All	All	All	LAT

Our Authority knows that on our FFSs, when we are checking the QTG, we are using a comparison between Simulator (green curve) vs Flight Test Data (blue curve) and also vs MQTG (grey/black curve) (and even vs previous years if necessary). This is helping us to concentrate on the changes since the initial qualification and our QTG tool is able to show these curves. This additional curve is not a reference but a big help to detect any changes. We agreed that for our recurrent qualifications, we provide also to the Authority the QTG with the 3 curves, even if this is not a mandatory requirement from the regulation.

We are doing this since more that 5 years and we only see positive aspects about it.

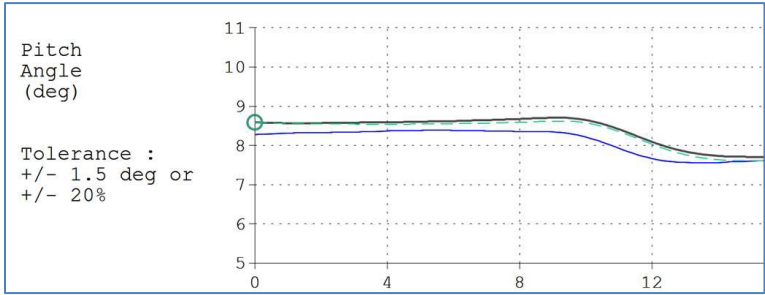
ARINC 436 is providing guideline for the colours but not more as in the regulation, only the Flight test data matter for the FFS .

Here an example where the pitch on the sim (green) is quite different from the A/C (blue), but as it matches exactly the Master (grey/black), we know immediately that there is no investigation to do for this parameter. Without the grey/black curve, I would have to spend some minutes to verify it.



Here another example where with the black/grey curve, I can see immediately that the pitch is good, better than the master. Without it, I also will have to spend time to validate it:

REGULATORY



How do other operators handle QTG assessment? Would regulators consider this as a recommendation for an industry best practice? Should ARINC 436 be updated with this type of guidance?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
65	Status of Manual Stabilizer Trim Forces for A/C other than B737-8/9	Engines	All	All	All	Civil	CAE

Background: Following the 737-8/9 accidents, FAA issued AD 2020-24-02 & EASA also issued AD No.: 2021-0039R2, which required certain modifications to full flight simulators used for pilot training, and one of the requirements specifically required FSTD operators to validate manual stabilizer trim wheel forces, to ensure these are adequate to meet the training objectives. In support of this requirement, Boeing issued SDB-737-006 to support operators to comply with the said requirements.

Question: We would like to understand the industry status with regard to the compliance to the above requirement for simulators other than the B737-8/9. Specifically, if A/C OEMs have provided data to support operators in meeting this requirement, and if the simulators have been validated to comply with the general requirement to establish the adequacy of the stabilizer trim force to meet training objectives.

Reference:

EASA AD 2021-0039R2

Evaluate the manual stabilizer trim system for proper control forces and travel as described in CS-FSTD(A) initial issue (and issue 2), Appendix 1 to CS FSTD(A).300 FSTD, points g.1 and i.1. As described in g.1, system operation should be predicated on and traceable to the system data provided by the aeroplane manufacturer, original equipment manufacturer, or alternative approved data. The instructions of Boeing SDB-737-006 provide an acceptable method for FSTD Operators to validate manual stabilizer trim wheel forces. Whenever the forces are not adequate to meet the training objectives, the FSTD Operator must declare the FFS unsuitable to conduct training on manual stabilizer trim wheel.

FAA AD 2020-24-02

This special training includes training on all of the areas identified by the commenters, including the use of manual stabilizer trim in an FFS. The FAA has taken steps to verify that, in accordance with 14 CFR 60.11(d), flight simulation training device (FSTD) sponsors have evaluated the manual stabilizer trim system for proper control forces and travel on each FAA-qualified Boeing 737 MAX FFS. If the forces do not meet the specified requirements of 14 CFR part 60, Appendix A, the FSTD sponsor must not allow use of the FFS to conduct training on the manual stabilizer trim wheel.

Discussion - Operators, TDMs, OEMs, and others:

REGULATORY

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
66	Ground Station Data		All	All	All	All	FSEMC

In some cases, depending on regulatory requirements, Ground Station Data (GSD) must be kept current to support training curriculums. The impact of this if not updated is unclear.

How do operators address this situation?

Can we have the regulatory panel comment?

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
67	Sound QTG		All	All	All	All	FSEMC

How do operators address sound QTGs, background noise, and repeatability issues that might arise?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
68	Lower Level Devices		All	All	All	All	IFTC

Can we discuss Lower Level Device (FTDs) usage and how credits could be granted for pilot training (Type/Re-current etc.) in the near future?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
69	Software Load Versions On FSTD SOQs		All	All	All	All	Boeing

Some regulators state the FSTD software load revision number on the FSTD qualification documentation. Any time a software change is made to the FSTD, no matter how minor, the regulator needs to be notified of the change in order to issue revised documentation which invariably leads to delays to the changes being placed into training. Given the software configuration control processes in place at most, if not all, FSTD operators, should the regulators rely on the FSTD operator tracking the changes to the software load via configuration control and remove the need to state the current software load revision number on the qualification documentation.

Discussion - Operators, TDMs, OEMs, and others:

REGULATORY

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
70	Training Product Load		All	CAE	2019	737MAX 320NEO	CATC

CAE currently releases the new version of software product load several times a year. Some of the new loads also come with changes to some of the QTG validation tests. These changes should be reflected in the Master QTG (MQTG) and be a pattern for further annual evaluation. The simulator operator performs validation tests in parts on a quarterly basis according to the EASA regulation.

Question:

- How often and in a what form other operators inform the Authority about any changes of the MQTG?
- Is it immediately after installing of the new load or cumulatively during the annual evaluation?

Discussion - Operators, TDMs, OEMs, and others:

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
71	Acceptance of Electronic MQTG						LAT

During a recent Initial Evaluation of a FFS, under EASA CS-FSTD(A) Issue 2 rules, the NAA requested a paper copy of the MQTG 30 days before RFT, for review and stamping. This is the usual practice and was expected by LAT. The TDM expressed surprise at the request, since the TDM had been able to just present an electronic copy of the MQTG 30 days before RFT (with paper copy at RFT-1 week) to several other European NAAs doing Initial Evaluation’s under EASA rules in previous projects.

To those NAA which accept electronic MQTG for review 30 days before RFT, and a paper copy 7 days before RFT: what motivated you to follow that path? How are changes to single pages/multiple QTG for remastering dealt with in the lifetime of the device –changes allowed by the electronic signature-?

To those NAA which do not accept electronic MQTG for review 30 days before RFT, requiring paper: which technological developments / changes to regulation do you think would be required for you to be in a position to accept electronic MQTG?

Non-EASA NAA please also comment

Discussion - Operators, TDMs, OEMs, and others:

REGULATORY

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
72	New ICAO Methodology For Assessing And Reporting Runway Surface Conditions (Global Reporting Format (GRF) not available in FSTD simulation (ATIS))		All	All			LAT

New ICAO Methodology For Assessing And Reporting Runway Surface Conditions
Global Reporting Format (GRF) not available in FSTD simulation (ATIS)

Authorities started to open reservations on various devices of our FSTD fleet, pointing to the fact, that the new format is not simulated via ATIS. LAT DE and representatives of our main customers cannot see the benefit for FSTD training, if this new format would be introduced, because pilots are informed via other training measures (Level B Training Item) and the training organizations would not train this new format in FSTDs.

How does EASA, FAA and other NAAs see this requirement? Is there any recommendation from EASA for the national competent authorities available?

Are there any other operators experiencing such authority reservations/requests?
How do the TDMs plan to cover this new format in the simulation for new devices and which solutions are already available for existing devices?

Is there a proposal from anyone, how a restriction can suitably show on the certificate, that the new GRF format cannot be provided?

Discussion - Operators, TDMs, OEMs, and others:

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73	Software Load Release info for MQTG						Boeing

Do operators who receive software load drops for device(s) receive sufficient information about the impact on the MQTG? – e.g. tests that might still remain in tolerance but where the match has changed, tests where additional rationales might have been added, tests where plots have been added etc. If sufficient information is not provided, what level of detail is deemed necessary?

Discussion - Operators, TDMs, OEMs, and others:

REGULATORY

<u>Item No.</u>	<u>Summary Title</u>	<u>Component</u>	<u>Part No. (Sim Mfr & Vendor)</u>	<u>Sim Mfr/Vendor Name</u>	<u>Year of Mfr</u>	<u>Aircraft Type</u>	<u>From User</u>
74	FAA Approved DPS						Boeing

Can the FAA outline what they consider to be the key process components they would expect to see detailed within an approved DPS (Discrepancy Prioritization System)?

Discussion - Operators, TDMs, OEMs, and others:

Operator Codes for Submitted Discussion Items

Airbus	Airbus
Alaska Airlines	ASA
All Nippon Airways	ANA
Boeing	Boeing
CAE	CAE
CAE Simulation Training Pvt. Ltd.	CSTPL
Cargolux	CLX
China Airlines	CAL
Czech Aviation Training Center	CATC
FedEx	FDX
Finnair	FIN
Fiji Airways	FIJI
FlightSafety International	FSI
FSEMC Steering Committee	FSEMC
International Flight Training Center	IFTC
KLM Royal Dutch Airlines	KLM
Lufthansa Aviation Training	LAT
L3 Harris	L3
Muller Simulation Consultancy bv	MSC