



**EU-Latin America and Caribbean
Aviation Partnership Project (EU-LAC APP)**

*Enhancing the aviation partnership between the EU and
Latin America and the Caribbean*

SC058 - Activity 2

OJT on FSTD certification processes

OJT Simulation On-site Evaluation FFS / Session 2

Project EU-LAC APP

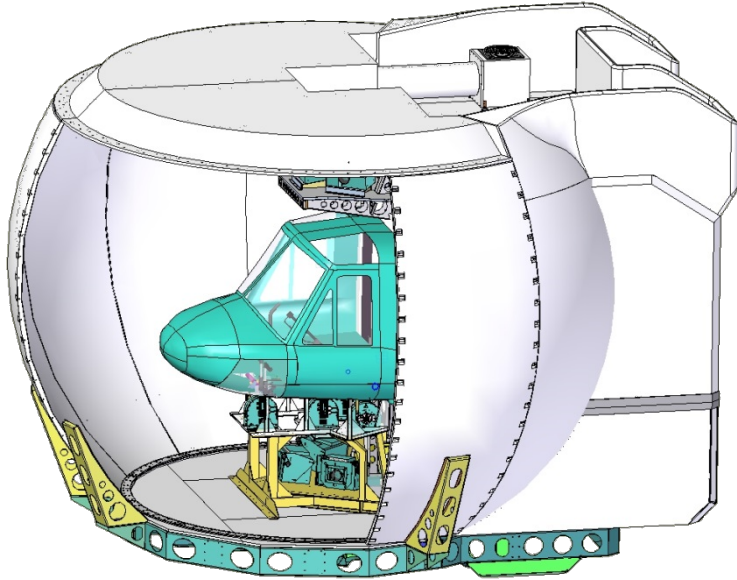
21/07/2020

Your safety is our mission.

OJT SIMULATION ON-SITE EVALUATION FFS

- MQTG RE-RUN AUTOMATIC TEST
- MQTG RE-RUN MANUAL TEST
- FACILITY REQUIREMENTS EVALUATION & FSTD SAFETY ITEMS
- SUBJECTIVE EVALUATION. FLIGHT PROFILE

MQTG RE-RUN AUTOMATIC TEST



MQTG RE-RUN AUTOMATIC TEST

→ OBJETIVE OF THE PROFF

- Check FSTD behaviour accordding to MQTG requeriments
- Obtain evidences that MQTG is representative of the FSTD
- Added to MQTG

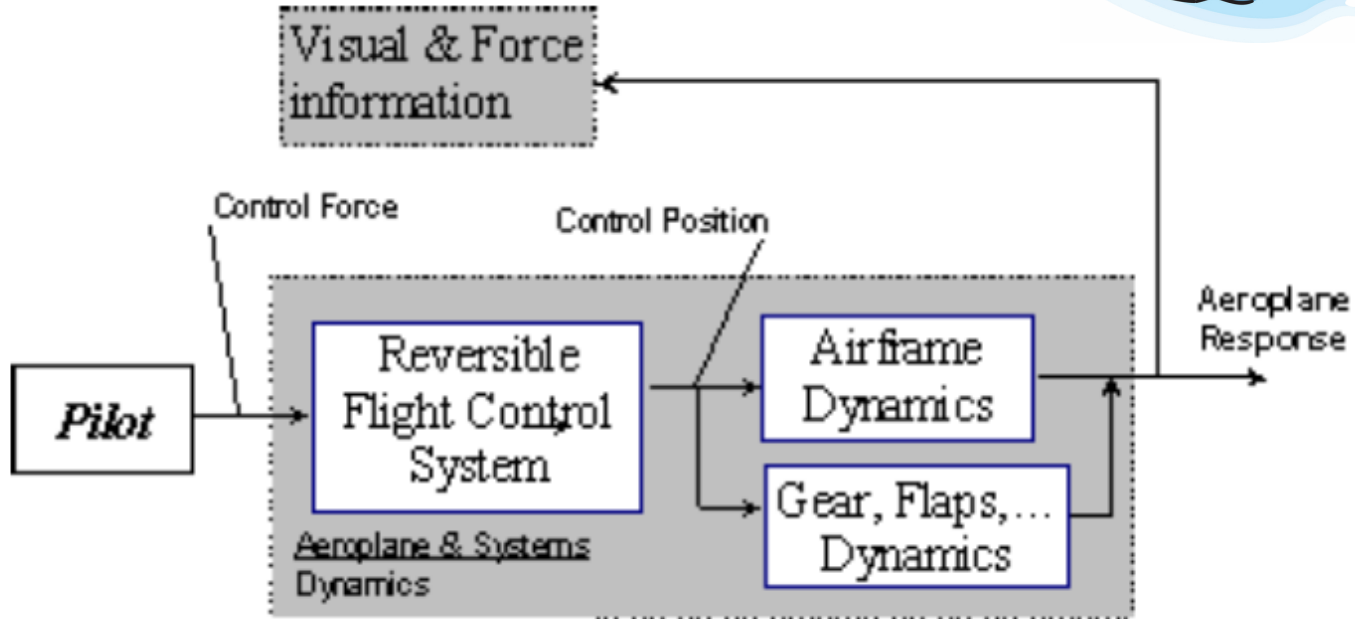
→ AUTOMATIC TEST

- Run directly for the device only with a specific SW tool or similar interface.
- No human interaction.

MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

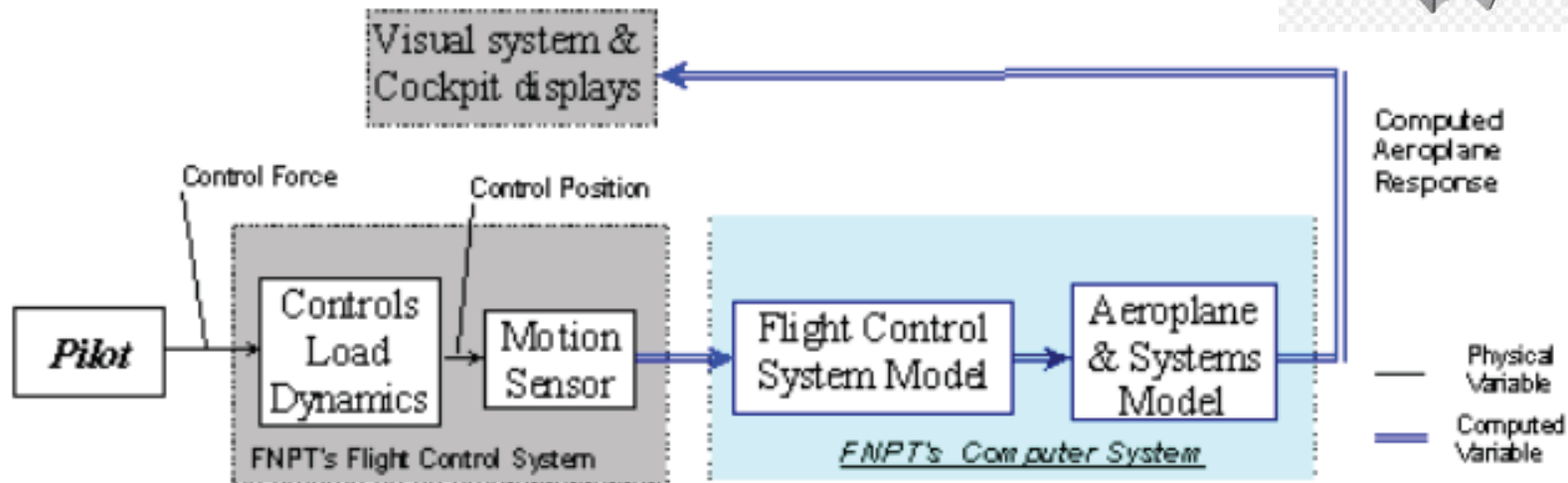
→ Airplane as a Dynamic System



MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

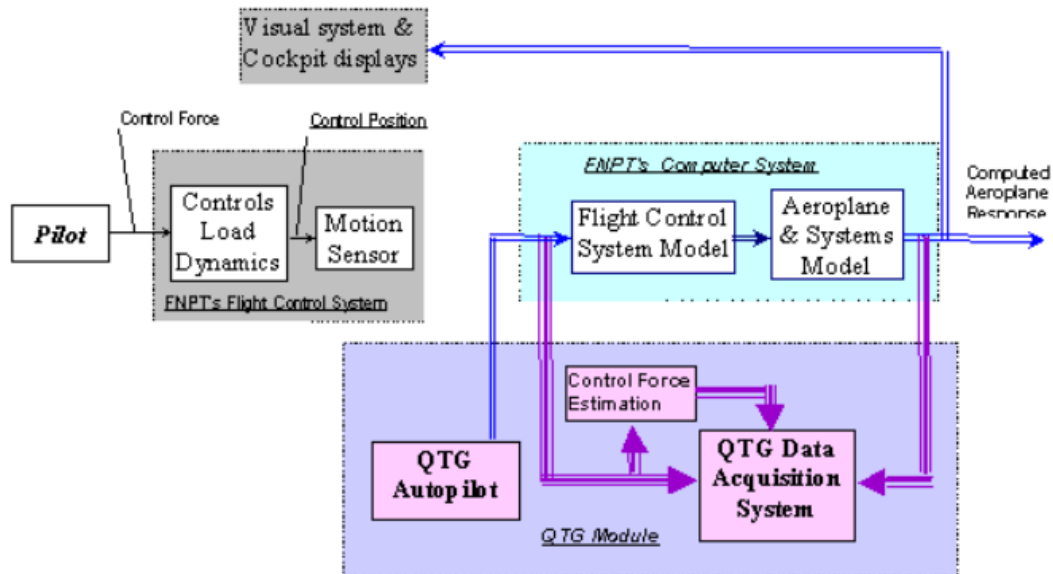
→ Control Signal Flow in an FSTD



MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

→ Automatic Test Signal Flow in FSTD



MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

→ QTG Autopilot SW Mode. Auto Test Modes



	AUTO_OFF	AUTO_MON E	AUTO_VZ	AUTO_SPE ED	AUTO_POW ER	AUTO_MAN	AUTO_HEA DING
IAS	Free	Free	Hold	Free	Hold	Free	Free
VZ	Free	Free	Free	Hold	Hold	Free	Hold
RPM	Free	Free	Hold	Hold	Hold	Free	Hold
Power	Free	Free	Hold	Hold	Auto	Free	Free
Heading	Free	Free	Free	Free	Free	Free	Hold
Sideslip	Free	Free	Free	Free	Free	Free	Hold
Power lever	Free	Free	Free	Auto	Auto	Fixed	Auto
Propeller lever	Free	Free	Free	Auto	Auto	Fixed	Auto
Pitch angle	Free	Free	Free	Hold	Hold	Free	Hold
Roll angle	Free	Free	Hold	Hold	Hold	Free	Hold
Sideslip angle	Free	Free	Free	Free	Free	Free	Free
Pitch control	Free	Free	Auto	Auto	Auto	Free	Auto
Roll control	Free	Free	Auto	Auto	Auto	Free	Auto
Rudder control	Free	Free	Auto	Auto	Auto	Free	Auto
Record of the Data	No	yes	yes	yes	yes	yes	yes

Free	The parameter is completely free and may change naturally during the flight.
Hold	The parameter is kept at a natural constant by changing the controls marked Auto.
Fixed	The control is set at a fixed value so that it can not be moved by any external forces.
Auto	The control is moved automatically in order to keep the parameters set to Hold at a constant value.

MQTG RE-RUN AUTOMATIC TEST



→ QTG SW MODULE

→ QTG Autopilot SW Mode. Command Sequence set Altitude 2000 ft 5''

Name	Comments
auto_OFF	Release QTG Auto_Test mode
power_FLIGHT_IDLE	Set engine parameters to flight idle power
power_GROUND_IDLE	Set engine parameters to ground idle power
power_TKOFF_MAX	Set engine parameters to maximum take-off power
power_GOAROUND_MAX	Set engine parameters to go-around power
wait	Suspend the test
Gear	Move the gear lever to the desired position, (0 for Up and 1 for Down)
Flaps	Move the flaps lever to the desired position
Spoiler	Unused
set_bank_angle	Ask the QTG Auto_Test to maintain the desired bank angle
set_attitude_angle	Ask the QTG Auto_Test to maintain the desired attitude angle
SQtgSetPaMode	Ask the QTG Auto_Test to maintain the desired rudder angle
Stop_Test	Stop the test procedure
Start_Test	Start the results recording
SetPAMode	Set the QTG Auto_Test to the desired mode
SetSpeed	Ask the QTG Auto_Test to maintain the desired speed
SetAttCmd	Send an impulse to the elevator
SetBankCmd	Send an impulse to the aileron
SetRudderCmd	Send an impulse to the rudder

Name	Comments
SetAttCmdPalier	Send a step to the elevator
SetRollCmdPalier	Send a step to the aileron
SetRudderCmdPalier	Send a step to the rudder
SetUserPower	Send a step to the power lever
SetPAManettes	Set the power lever to the desired position
EngineBroken	Change the aircraft state: 0 for 'All engines operating', 1 for 'Left engine in-op', 2 for 'right engine in-op' and 3 for 'All engines in-op'
Visu_Instru_Qtg_msg	Ask the Instruments and visualization modules to send pitch, roll and yaw angle position
trim_prof	Set the pitch trim to the desired position
trim_dir	Set the yaw trim to the desired position
mem_pos_trim	Set the effort origin
deconnectionPA_att	Disable QTG Auto_Test in pitch axis
deconnectionPA_roll	Disable QTG Auto_Test in roll axis
deconnectionPA_rudder	Disable QTG Auto_Test in yaw axis
mode_stop	Set the aircraft to STOP or GO mode (0 for GO and 1 for STOP)
set_rudder_auto_heading	Set the QTG Auto_Test to AUTO_HEADING mode and ask it to maintain the desired rudder angle
incAltitude	Increase the altitude of the aircraft with the desired step
setAltitude	Set the altitude of the aircraft to the desired value

MQTG RE-RUN AUTOMATIC TEST



QTGPlayer

Conversion to Flight Model

St	Date	Otg Name
✓	12/09/17	DA42_QTG
✓	24/08/17	MPG10_A_FNPT2_AL250
✓	24/08/17	MPG3_A_FNPT2_AL250
✓	24/08/17	BPG9_A_FNPT2_AL250

The QTG file is now open.

The list of tests contained in the QTG file is displayed in the bottom left part of the software. You can select a test by clicking on it. For each test, the test protocol will be displayed as a pdf document and the test results will be show as charts.

The following functions are now available :

- Run a test of the QTG.
- Export in pdf or print a test of the QTG.
- Save the QTG file

Quarter dates : **up to date**
Quarter 1 : 25/07/17
Quarter 2 : 25/07/17
Quarter 3 : 25/07/17
Quarter 4 : 25/07/17

St	Date	Id	Test Descrip
✓	25/07/17	1 c 1	Normal clim
✓	25/07/17	1 f 1	Engine acce
✓	25/07/17	1 f 2	Engine dece
✓	25/07/17	2 a 1 2	Column pos
✓	25/07/17	2 a 2 2	Wheel posit
✓	25/07/17	2 a 3 2	Pedal positi
✓	25/07/17	2 c 1 1	Power chan
✓	25/07/17	2 c 1 2	Power chan
✓	25/07/17	2 c 2 1 a	Flaps chang
✓	25/07/17	2 c 2 1 b	Flaps chang
✓	25/07/17	2 c 2 2 a	Flaps chang
✓	25/07/17	2 c 2 2 b	Flaps chang
✓	25/07/17	2 c 5 a	Longitudinal
✓	25/07/17	2 c 5 b	Longitudinal
✓	25/07/17	2 c 6 a	Longitudinal
✓	25/07/17	2 c 6 b	Longitudinal
✓	25/07/17	2 c 7	Longitudinal
✓	25/07/17	2 c 8 a	Stall charac
✓	25/07/17	2 c 8 b	Stall charac
✓	25/07/17	2 c 9	Phugoid dyr
✓	25/07/17	2 c 10	Short perio

Force Manual

MQTG RE-RUN AUTOMATIC TEST



Description **Editor** Graphs

Current Revision

2.0

Revision Log

Number	Date	Log
1.0	05/27/16	Creation of the document
1.1	08/14/16	Initial conditions update
2.0	10/06/16	Tolerances update

Notes

Apply Restore

Test Report

Name : Normal climb all engines operating.
ID : 1 c i

EADI

Flight

Attitude 5.8°
Bank 0.0°
Heading 186.0°
IAS 105 kts
VS 735 ft/min
Altitude 2600 ft
Ground Temp 15.0 °C
Gear Up
Flaps 0
Weight 1724 kg

Controls

Pitch 15%
Roll 0%
Yaw 0%

Levers

Throttle Prop Mixture

Engine

Left	Power/NG	Right
25.0		25.0
2499.9	RPM	2499.9

Autopilot

Mode : AUTO_VZ

Target IAS 105	Target RPM 2500	Gear UP
Target VZ Free	Target Power 25	Flaps 0
Target Heading Free	Target Bank 0	

Progress

Initialisation...

Command

Name	Explain	Parameter	Time
Start_Test	Start the results recording	0.0	0
Stop_Test	Stop the test procedure	0.0	90

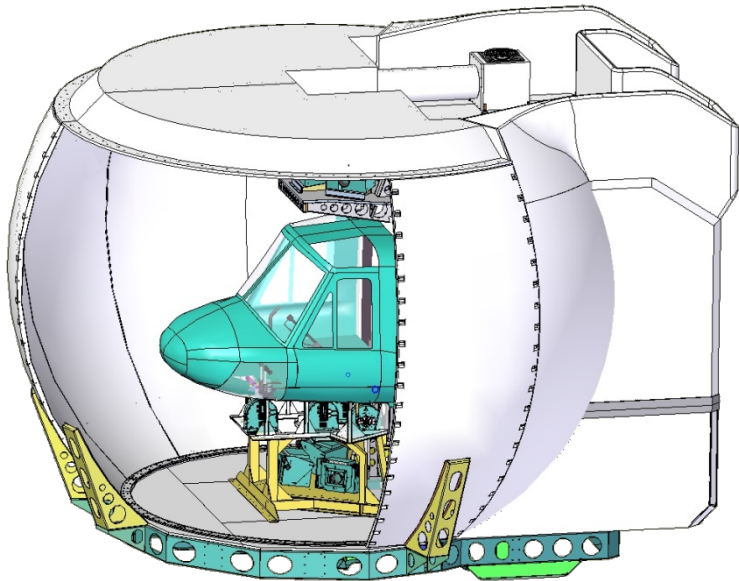
MQTG RE-RUN AUTOMATIC TEST



REVIEW AESA DOCUMENTATION



MQTG RE-RUN MANUAL TEST



MQTG RE-RUN MANUAL TEST

→ OBJETIVE OF THE PROFF

- Check FSTD behaviour accordding to MQTG requeriments
- Obtain evidences that MQTG is representative of the FSTD
- Only for checking purpose (Except visual...)

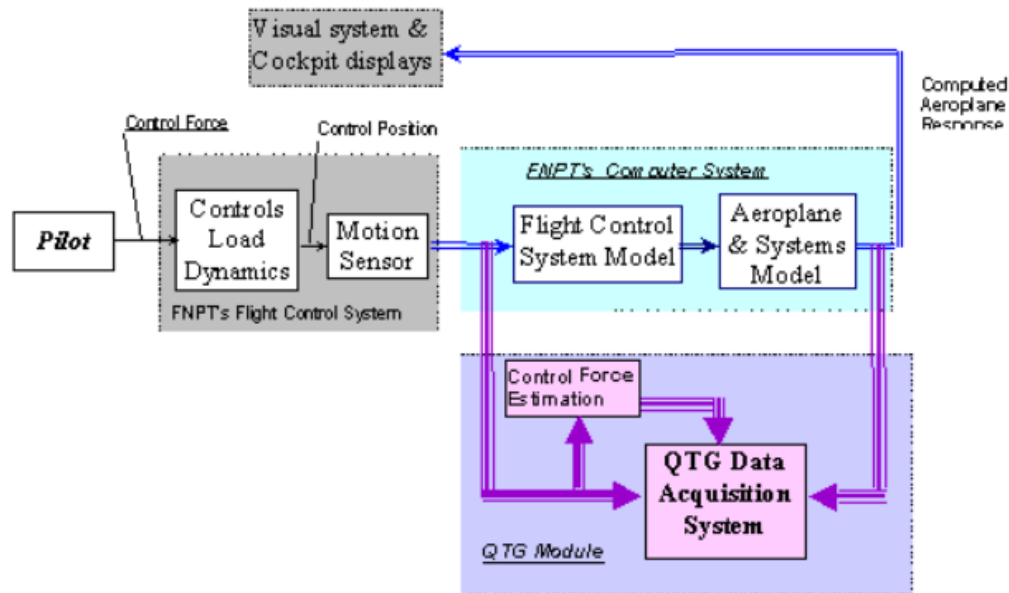
→ MANUAL TEST

- Run without a specific SW tool or similar interface.
- Human interaction.

MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

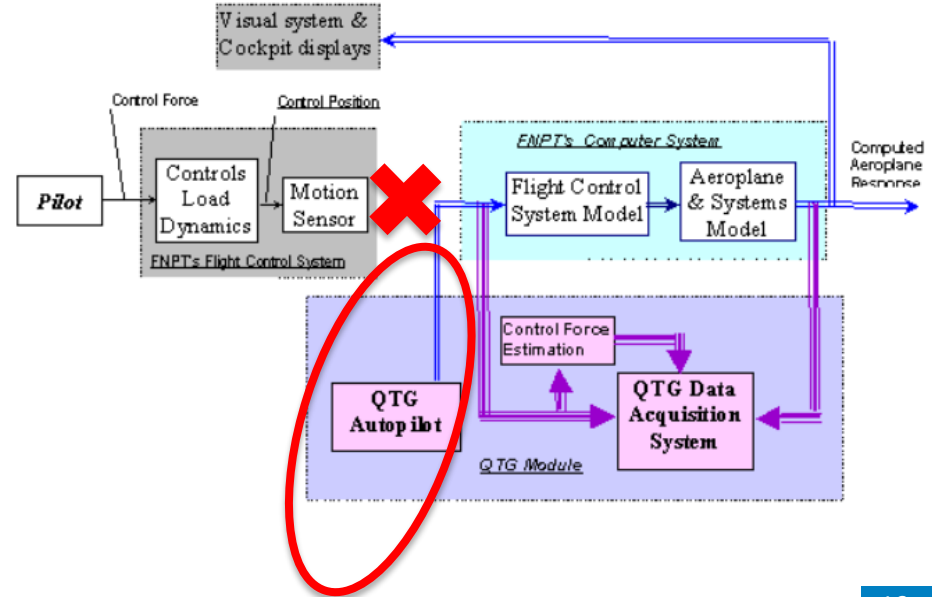
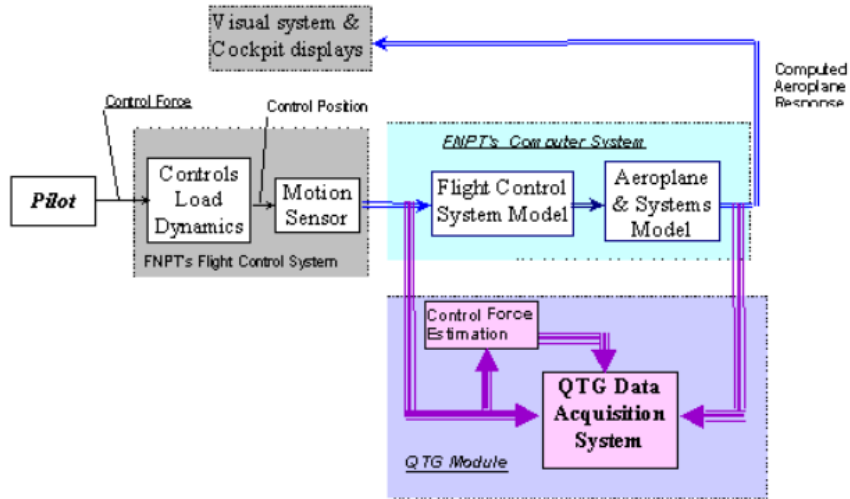
→ Manual Test Signal Flow in FSTD



MQTG RE-RUN AUTOMATIC TEST

→ QTG SW MODULE

→ Manual Test VS Automatic Test Signal Flow in FSTD



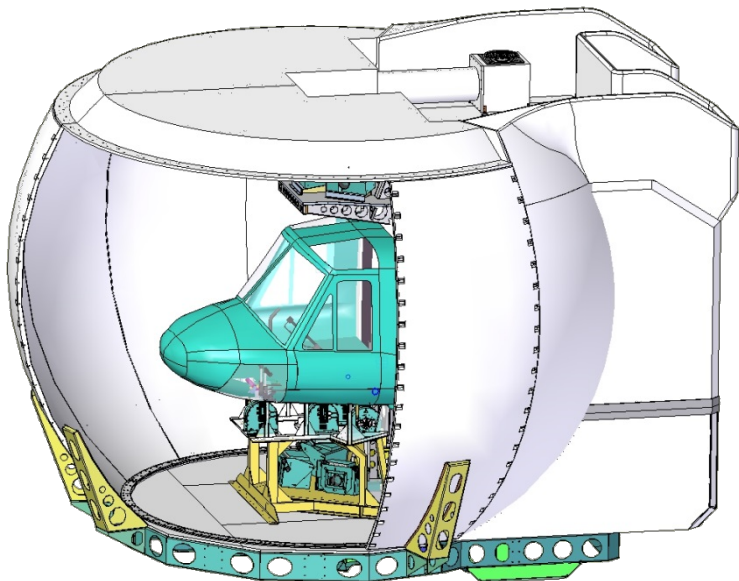
MQTG RE-RUN AUTOMATIC TEST



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FACILITY REQUIREMENTS EVALUATION & FSTD SAFETY ITEMS



FACILITY REQUIREMENTS EVALUATION & FSTD SAFETY ITEMS

→ FACILITIES

- Comply with Spanish Administrative Regulation of Health & Safety

→ FSTD

- Installed according to manufacturer specifications
- Safety items & procedures

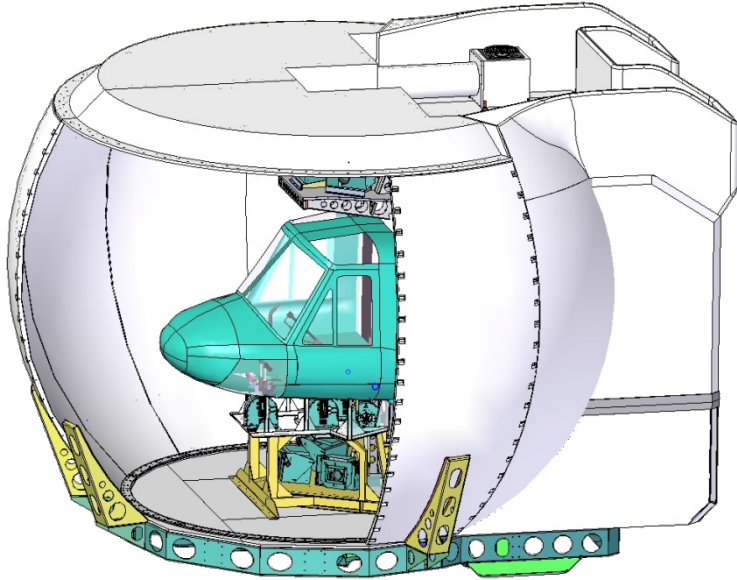
FACILITY REQUIREMENTS EVALUATION & FSTD SAFETY ITEMS



REVIEW AESA DOCUMENTATION



SUBJECTIVE EVALUATION. FLIGHT PROFILE



SUBJECTIVE EVALUATION. FLIGHT PROFILE

→ OBJECTIVE OF THE PROOF

- Check Real FSTD Behaviour. Most Important Check of the Audit (Suitable for Training or not)
- TEST in AMC1 FSTD(A/H).300 Qualification basis (c) (c) Functions and subjective tests

→ SUPPORT DOC

- Evaluation of the Operator SUBJ FLIGHT & Manufacturer ATM
- AFM, FCOM, POH (FSTD/Aircraft)
- RAES Handbook Vol II

SUBJECTIVE EVALUATION. FLIGHT PROFILE



REVIEW AESA DOCUMENTATION





EU-Latin America and Caribbean Aviation Partnership Project (EU-LAC APP)

*Enhancing the aviation partnership between the EU and
Latin America and the Caribbean*

Muchas gracias

www.eu-lac-app.org

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implemented by the European Aviation Safety Agency*

easa.europa.eu/connect



Your safety is our mission.

An Agency of the European Union 