Flight Safety Notification
General

Flight Safety Notifications (FSNs) are not mandatory in nature, but provide means such as guidance, methods, procedures and practices acceptable to the Authority for complying with regulations and other requirements in a systematic manner. These are not necessarily the only means of compliance. FSNs may also contain explanations of regulations, other guidance material, best practices or information useful to the aviation community. Unless incorporated into a regulation by reference, FSNs are not regulatory and do not create or change a regulatory requirement. A change of a regulatory requirement may come in the form of a Directive. A Flight Safety Notification is not a Directive.

E2 Ratings for Avionics Licences

Purpose

This Flight Safety Notification (FSN) informs industry of the availability of examinations for Aircraft Maintenance Engineers (AME) seeking E2 qualifications.

Background

The E2 rating encompasses the following systems: Flight management, Autopilot and Flight Director. Previously the Authority would have issued AME licences in the E1 Avionics Category only. AMEs working on autopilot systems would have done so under the approval(s) issued to them by the Approved Maintenance Organization or the Commercial Operator and supported by aircraft type training.

References

The Civil Aviation Regulation 2102 as amended, Eighth "A" Schedule; subsection 8.036
The Civil Aviation Regulation 2102 as amended, Eighth "A" Schedule; subsection 8.038
The Civil Aviation Regulation 2102 as amended, Twenty Second Schedule
Appendix 1, the Jamaica Civil Aviation Authority E2 Syllabus

Applicability

E1 Licenced Aircraft Maintenance Engineers

Eligibility

To be eligible to apply for E2 privileges the candidate must be the holder of a current E1 AME Avionics licence, have successfully completed an approved training program covering topics

included in the syllabus (Appendix 1) attached to this notification, and have at least six months documented experience working on the related systems. If the candidate has met all the requirements, he will then be allowed to sit an examination administered by the Authority, for which a passing grade of 80% must be attained.

Examination

The duration of the examination is seventy five (75) minutes and consists of fifty (50) multi-choice questions. Currently no oral examination is required for this rating. Once the candidate is successful and all the applicable fees are paid, his licence will be endorsed with the E2 rating.

References Material

The following are the recommended texts which perspective candidates may use in preparing to sit the examination:

- Aircraft Instruments and Integrated Systems by E. H. J. Pallet.
- Automatic Flight Controls, Fourth Edition by E. H. J. Pallet.
- Jeppesen Avionics Fundamentals.

Applications

Persons wishing to apply or the E2 rating must first complete the AME Licence Application Form (FS013) and pay the applicable fee. Applicants will be required to provide proof of their valid E1 qualification, training and experience. Evidence of this must be submitted with the completed application form.

Approved by: _____ Date: (06/SEP/2018)

Mr. Noel Ellis
Director, Flight Safety
for Director-General of Civil Aviation
Jamaica Civil Aviation Authority

Appendix 1

APPROVED COURSE CRITERIA AND SYLLABUS FOR "E 2" LICENCES

(1) The topics listed in the following pages are those with which an applicant for an AME E2 rating must be fully conversant in order to be able to carry out the functions of the rating. The levels indicated (1, 2 or 3) represent the degree of familiarity needed with each topic and serve as a guide for student and instructor alike, on how much depth of knowledge is required. Where no number is shown, the number above is applicable. The Groups for which each Module was designed are indicated at the beginning of the Module.

- **Level 1**: An overview of the system or topic designed to give the student a general familiarity, including functioning, safety precautions, tooling, and maintenance practices peculiar to the systems involved.

- **Level 2**: A working knowledge of the system or topic, allowing the student to be able to understand and work with the relevant aircraft manuals, as well as to be able to apply troubleshooting techniques and suggest solutions to problems.

- **Level 3**: A detailed knowledge of the topic, enabling the student to progress immediately to carrying out function checks, troubleshooting and snag rectification or adjustment, using the relevant manuals.

(2) The examinations for the E2 AME rating is given in written format, consisting of a multi-choice paper.

Level	Subject:
2	Theory of Flight (Fixed Wing)
2	Forces on the aircraft
2	Stability-dihedral, sweepback, etc.
2	Control axis.
2	Primary control surfaces-operation and effect on the aircraft.
2	Secondary controls.
2	Forces during turns.
2	Functions of trim tabs, balance tabs and servo tabs.
2	High speed buffet and stall conditions.
2	Auto-pilot control axis.
2	Auto-stabilizers-wing levellers.
2	Coordinated turns, aileron/rudder cross feed.
2	Versine generation and application.

Level	Subject:
2	Sideslip monitors-slip and skid in a turn.
2	Turbulence penetration and the effect on autopilot control.

Yaw Dampers

Level	Subject:
2	Dutch Roll phenomenon.
2	Yaw sensing.
2	Yaw signal processing.
2	Synchronization.
2	Series and parallel systems.
2	Cockpit indication.
2	Aileron/rudder control interaction in turns.
2	Rudder PCU, LRUs.
2	Interlocks with autopilot systems.

Pitch Trim Systems

Level	Subject:
2	Longitudinal axis stability.
2	High speed tuck.
2	Mach No. inputs.

Mach Trim

Level	Subject:
2	Mach trim actuators computation.
2	Connections with aircraft controls.
2	Warnings.

Alpha Trim

Level	Subject:
2	Angle of attack sensing.
2	Computation.
2	Interface with other aircraft systems: e.g. N1 computers-stall warning systems.
2	Flight directors.

Auto-Stabilizers

Level	Subject
2	Trim actuators-control and safety interlock.
2	Speed change systems for trim actuators.
2	Elevator/stabilizer interaction.
2	Interlocks.

C of G Trimmers

Level	Subject
2	Computation.
2	Indication.

Demand Signals

Level	Subject
2	Control wheel steering systems.
2	Touch wheel steering systems.

Auto Throttle

Level	Subject
2	Signal sources, inputs.
2	Modes, computation.
2	Indications

Automatic Landing Systems

Level	Subject
2	Signal sources, equipment
2	Categories, computation.
2	Indications and warnings

Fly By Wire

Level	Subject
1	Principle
1	System architecture

MODULE 2: AUTOMATIC PILOTS – COMMON (Group E2)

Level	Subject:
2	Error Signals
2	Rate system-errors and control.
2	Displacement system-errors and control.
2	Heading and course error inputs.
2	Radio beam deviation inputs.
2	Attitude inputs.
2	CADC/autopilot interface - e.g. q or % adaptation.
2	Sideslip sensors and monitors.

Signal Processing

Level	Subject:
2	Typical channel signal flow path.
2	Buffer amps.
2	Input signal modulation.
2	Summing points.
2	Signal sensors and switching functions.
2	Integrators.
2	Limiters.
2	Gain programmers.
2	Dual channel monitors.
2	Voter systems.

Demand Signals

Level	Subject:
2	Mode selectors.
2	Control display units.
2	Turn controllers.
2	Control column transducers.
2	Command override systems.
2	Mode compatibility.
2	Mode annunciators.
2	Failure and disconnect lights and aural warnings.
2	Interlocks-pre-and post-engage
2	Pitch attitude trim.

MODULE 2: AUTOMATIC PILOTS – COMMON (Group E2)

Level	Subject:
2	Roll out/heading-hold, engage,
2	Synchronization.
2	Trim monitors and indicators.
2	Altitude hold inputs.
2	Vertical speed control.
2	Mach/IAS hold.
2	Altitude acquire or change systems.

Command Signal Outputs

Level	Subject
2	Power control units-line replaceable units.
2	Solenoid valves.
2	Transfer valves.
2	Position sensors.
2	Servomotors-construction, interconnection with control runs.
2	Clutches-torque settings.
2	Brakes.
2	Tachogenerators - feedback and damping.
2	Position feedback - indication.
2	Torque limiting.
2	Hardover sensing - disconnection.
2	Jam detection.
2	Runway conditions - disconnection
2	Pilot override - disconnection

Flight Management Systems

Level	Subject
1	System architecture, database and components
1	Controls, Displays and indications
1	System function
1	Interface with other systems.

Flight Director/Flight Path Computation

Level	Subject
2.	Signal sources, radio inputs.
2.	Modes, computation.
	Displays: HSI and ADI