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Flight Simulation Operational Plan 2012-14

Version 1.0

C I V I L A V I A T I O N S A F E T Y A U T H O R I T Y

safe skies for all

Executive Summary

This Flight Simulation Operational Plan 2012-14 sets out CASA's goals for the use of flight simulation and details a number of initiatives which, when implemented, will enhance aviation safety by improving CASA's regulatory oversight of flying training and testing conducted in flight simulators.

CASA supports the use of simulators with appropriate fidelity at all levels of the aviation industry. Flight simulators provide more in-depth training, particularly in the practice of emergency and abnormal operations, than can be accomplished in aircraft.

One of CASA's six goals for flight simulation is to adopt the classification structure of fixed and rotary wing simulator devices contained within the International Civil Aviation Organization's Document 9625. This will assist achieve international harmonisation.

Opportunities exist for the aviation industry to take advantage of the training, testing and safety benefits derived from the use of simulators.

Abbreviations

AEB	Airworthiness Engineering Branch
CAAP	Civil Aviation Advisory Publication
CAO	<i>Civil Aviation Order</i>
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FOI	Flying Operations Inspector
FSB	Flying Standards Branch
FSD 2	Operational Standards and Requirements – Approved Synthetic Trainers (FSD-2) Manual
FSTD	Flight Simulation Training Device
ICAO	International Civil Aviation Organization
ICFQ	International Committee for Flight Simulation Qualification
JAA	Joint Aviation Authorities
MPL	Multi-crew Pilot Licence
NAA	National Aviation Authority
RAeS	Royal Aeronautical Society
SFTD	Synthetic Flight Training Device
STD	Synthetic Training Device

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1. Introduction

The purpose of this document is to detail the Civil Aviation Safety Authority's (CASA) operational plan for flight simulation in accordance with an initiative detailed in CASA's *Corporate Plan 2012-13 to 2014-15*.

CASA supports the use of simulators with appropriate fidelity at all levels of the aviation industry. Industry is encouraged to invest in devices with suitable technology to enhance aviation safety and improve flying training and testing outcomes.

The availability and advancement of modern technology has permitted the greater use of Flight Simulator Training Devices (FSTD) for training, testing and checking of flight crew members. The complexity, cost and operating environment of modern aircraft has also encouraged the broader use of advanced simulation.

Flight simulators can provide more in-depth training than can be accomplished in aircraft and provides a safe and suitable learning environment. Practice of emergency and abnormal operations can be conducted with reduced risk exposure and in greater depth in a simulator than is often possible in an aircraft.

Fidelity of modern FSTDs is sufficient to permit pilot assessment with assurance that the observed behaviour will transfer to the aircraft.

Fuel conservation and reduction in adverse environmental effects are important by-products of FSTD use.

This *Flight Simulation Operational Plan 2012-14* sets out CASA's goals for the use of flight simulation and details a number of initiatives which, when implemented, will enhance aviation safety by improving CASA's regulatory oversight of flying training and testing conducted in FSTDs.

2. CASA's Goals for Flight Simulation

The following are high-level goals CASA has in relation to flight simulation:

1. Adoption of the classification framework contained in International Civil Aviation Organization (ICAO) Document (Doc) 9625 for fixed wing and rotary wing simulators as a means of enhancing international harmonisation
2. Mandating the use of simulators for certain types of aircraft for the training and checking of certain high-risk emergency procedures

3. Amending Part 60 of the *Civil Aviation Safety Regulations 1998* (CASR) to provide coverage of all flight simulation devices
4. Improving oversight of organisations involved in flight simulator training via the introduction of CASR Part 142
5. Encouraging the aviation industry, including the flying training sector, to increase the use of flight simulation devices with appropriate fidelity
6. Encouraging extant simulator operators to invest in the adequate maintenance and upgrading of their devices to ensure the devices remain an appropriate platform for training and checking

3. The International Regulatory Situation

With rapidly emerging simulator technologies and new pilot training methodologies current regulations risk becoming out-dated.

Most major National Aviation Authorities (NAA) have implemented regulatory changes. EASA has adopted the former Joint Aviation Authorities (JAA) rules, and the United States' Federal Aviation Administration (FAA) has a Part 60. Significantly, there is little or no harmonisation between NAA's.

The development of the Multi-crew Pilot Licence (MPL) by ICAO, designed to permit greater integrated use of flight simulation, highlighted the lack of consistency in the definition of simulator device levels between NAAs.

The International Committee for Flight Simulation Qualification (ICFQ) was formed under the auspices of the Royal Aeronautical Society (RAeS) to develop a new set of ICAO qualification criteria for the complete suite of FSTDs. The new criterion covers the full range of flight simulator devices, from basic instrument trainers to zero flight time full flight simulators.

This work by the ICFQ resulted in Edition 3 to the ICAO Doc 9625 Volume 1 (Fixed Wing) being published in July 2009, and Volume 2 (Rotorcraft) being published in May 2012.

To date, only two NAA's (Singapore and Russia) have fully adopted ICAO Doc 9625.

ICFQ hosted a meeting for regulators in London on 25 September 2012 in order to promote the adoption of ICAO Doc 9625 in order to achieve international harmonisation in the regulation of FSTDs. Ten regulatory agencies were present. EASA advised that the adoption of ICAO Doc 9625 is on the rule making schedule for 2014, as the priority for rule making has been assigned to EASA Parts FCL, MED and OPS. The FAA advised that an amendment to

Federal Aviation regulation (FAR) Part 60 is scheduled, however, the rule making priority is to achieve the requirements specified by Congress resulting from the Colgan accident in 2008. The FAA further advised that within the scope of the amendments scheduled for Part 60 it is likely that two (out of seven) ICAO FSTD classifications could be adopted.

4. Australia's Regulatory Situation

CASA legislation for flight simulation is contained in CASR Part 60 for full flight simulators and CAO 45.0 for synthetic training devices (STD).

As part of CASA's Regulatory Reform Program, CAOs will be progressively withdrawn. Accordingly, CASR Part 60 will need to be amended to include devices currently covered by CAO 45.0. CASA is currently reviewing Doc 9625 and CASR Part 60 to determine the scope of amendment action required.

It is possible that, with adoption of a harmonised approach to device classification in accordance with the ICAO approach, a number of current SFTDs operating in the flying training sector of the aviation industry may not retain the same flight time credits that are currently applicable.

When CASR Part 142 is introduced during 2013-14, simulator training organisations will be included. This will be the first time that CASA will provide oversight at an organisational level, rather than the current situation of oversight being effected through individuals (approved persons) and devices. This initiative will enhance aviation safety and align Australia with leading NAAs.

CASA has also notified industry of plans to mandate the use of simulators for certain types of aircraft and for the conduct of certain types of training and testing. This initiative will significantly reduce the risk of accidents occurring during emergency procedures training and testing and will enhance aviation safety.

5. Snapshot of Australian Flight Simulator Devices

Generally, full flight simulators and flight training devices are operated by the major airlines or by dedicated simulator training centres. STDs are usually operated by flying schools and smaller charter organisations.

The statistics below are for full flight simulators, flight training devices, STDs and foreign based synthetic flight trainers qualified by CASA:

- Domestic Full-Flight Simulators: **34**
- Domestic Flight Training Devices (no motion): **5**
- Domestic STD devices (instrument flight trainers): **91**
- International Qualified Flight Training Devices:
 - 1 x Full Flight Simulator (A330-200) in Malaysia
 - 1 x FSD-2 STD in Singapore

Rotorcraft Simulators

At this stage, due to the high cost of these devices, no full flight helicopter simulators have been commissioned in Australia. With expansion of the North West oil and natural gas platforms there has been an increase of large helicopters into Australia. Australian based operators currently use simulators located in Europe and the United States for training.

Operators are now looking at Asia for simulator training. Presently an EC225 simulator is being placed into a new helicopter training facility in Malaysia and a Dauphin AS365 simulator has become operational in Singapore.

These devices will require some oversight by CASA to ensure training and suitability requirements meet CASAs regulatory requirements.

6. CASA's Oversight of Flight Simulators

There are four main areas within CASA with responsibility for flight simulation devices:

Airworthiness and Engineering Branch – Standards Division

CASA's Flight Simulator Engineer in the Airworthiness and Engineering Branch (AEB) is involved in technical standards of devices and participates in the initial evaluation and qualification of all new CASR Part 60 devices.

Flying Standards Branch – Operations Division

CASA's Flying Standards Branch (FSB) has responsibility for the operational aspects of flight simulation devices.

CASA's Flight Simulator Specialist is a member of the FSB and has the following duties:

- manage and approve all Flight Simulators and Flight Training Devices in Australia and overseas
- assess and recommend CASR Part 60.055 approvals for users of both domestic and foreign simulators within training and checking organisations
- evaluate and qualify new simulators and flight training devices coming into Australia in conjunction with the Flight Simulator Engineer in AEB
- provide technical advice and input into the development of education, advisory information and other guidance material for synthetic flight training devices
- manage, appoint and oversee industry Simulator Evaluation Team Leaders in accordance with CASR 60.090

Flight Operations and Licencing Branch - Standards Division

The Flight Operations and Licencing Branch of the Standards Division is responsible for the development of appropriate legislative standards and for CASR Part 60. FSB and AEB work collaboratively with Standards Division on flight simulation regulatory development projects.

Regional Offices – Operations Division

Flying Operations Inspectors (FOI) within Regional Offices are responsible for the approval and ongoing fidelity assessments of CAO 45.0 devices. Regional Offices are also responsible for assessing training and checking programs which use flight simulation devices.

CASA oversees flight simulator devices in the following manner:

CASR Part 60 Devices

CASA's FSB has responsibility for the oversight of domestically and internationally located flight simulators and flight training devices approved under CASR Part 60. Initial evaluation and qualification of new CASR Part 60 devices is achieved in collaboration with CASA's Flight Simulator Engineer in AEB, and the Flight Simulator Specialist in FSB.

CAO 45.0 FSD-2 Devices

CASA's Regional Offices have responsibility for the oversight of domestically located STD's approved under CAO 45.0. FSB will provide technical advice to Regional Offices. FSB, in collaboration with the appropriate Regional Office, has responsibility for conducting initial evaluation and qualification of any new

FSD-2 STD wishing to meet Category C approval. FSB also has responsibility for internationally located STDs approved under CAO 45.0.

7. CASA's Flight Simulator Initiatives

In addition to the goals set out in section 2 the following initiatives are either underway or planned to be commenced:

- FSB technical input to the flight simulator content of the regulatory and technical training for FOI's
- Amendment to the Operational Standards and Requirements – Approved Synthetic Trainers (FSD-2) Manual
- Project to amend CAAP 5.14(0) to improve guidance to industry in order to prevent misinterpretations and non-compliance of CAAP in allowing for the use of overseas simulators and providers to renew instrument ratings
- Ongoing engagement with the ICFQ, ICAO, RAeS and other regulatory authorities on flight simulation matters
- Development of standardised, efficient and consistent process to support improved oversight of FSD-2 type devices
- Development and conduct of education and provision of advice for CASA FOI's to better understand FSD-2 approval and annual fidelity check processes
- Improving industry advice and communication on flight simulation matters

8. Updating this Plan

This is Version 1.0 of the *Flight Simulation Operational Plan 2012-14*. This plan will be subject to regular review and will be updated when any matter of significant change is planned to be adopted by CASA.

9. Conclusion

Technological advances have seen significant improvement in the fidelity of flight simulation devices at all levels. Opportunities exist for the aviation industry to take advantage of the training, testing and safety benefits derived from the use of simulators. CASA encourages, and in some cases mandates, the use of simulators.

In order to provide the Australian aviation industry with the advantages that can be gained from a legislative framework that is as internationally harmonised as possible, this strategic and operational plan sets out six key goals and a number of other initiatives CASA has underway, or planned, for flight simulators.

[Signed]

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