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May 2008

JAR-FSTD H: HELICOPTER FLIGHT SIMULATION TRAINING DEVICES

Please find attached the initial issue of JAR-FSTD H dated 1 May 2008, with an effectivity date of 1 August 2008.

JAR-FSTD H is an amalgamation of JAR-STD 1H, 2H and 3H into one document. Please note that this process has not changed the actual requirements, however, the regulatory processes for qualifying each different type of device have been harmonized.
As a result of this process, JAR-STD 1H, 2H and 3H will be superseded by JAR-FSTD H as of 1 August 2008.

Instructions on how to incorporate the affected pages are available at the end of this letter.

Customers who have purchased copies of JAR-STD H/JAR-FSTD H and wish to receive future amendments, should ensure that they have made suitable arrangements with IHS, Inc., to whom any queries regarding the sale and distribution of JAA documents can be directed. Addresses of the worldwide IHS offices are listed on the JAA website (www.jaa.nl) and IHS's website (www.global.ihs.com).

Queries related to the technical contents of the code should be made to JAA via e-mail address: publications@jaat.eu.

Andre Auer
Chief Executive

JAR-FSTD H, Initial issue, 01 May 2008

Please replace and insert the following pages included in this package as follows:

Remove complete JAR-STD 1H, 2H and 3H (valid until 01 August 2008)
Insert complete JAR-FSTD H, initial issue of 01 May 2008 (effective 01 August 2008)

LIST OF JAR DOCUMENTS

[LIST OF JAR DOCUMENTS	Issue 99	May 2008**]**
JAR-1, DEFINITIONS AND ABBREVIATIONS (No Basic Code)	Amendment 6	1 November 2004
JAR 11, JAA REGULATORY AND RELATED PROCEDURES (No Basic Code)	Amendment 1	1November 2004
JAR-21, CERTIFICATION PROCEDURES FOR AIRCRAFT AND RELATED PRODUCTS AND PARTS (No Basic Code)	Amendment 7	1 February 2007
JAR-22, SAILPLANES AND POWERED SAILPLANES (Basic Code Luftüchtigkeitsforderungen für Segelflugzeuge und Motorsegler (LFSM))†	Amendment 9	1 February 2007
JAR-23, NORMAL, UTILITY, AEROBATIC, AND COMMUTER CATEGORY AEROPLANES (Basic Code FAR Part 23)	Amendment 3	1 February 2007
JAR-25, LARGE AEROPLANES (Basic Code FAR Part 25)	Amendment 20	1 December 2007
JAR-26, ADDITIONAL AIRWORTHINESS REQUIREMENTS FOR OPERATIONS (No Basic Code)	Amendment 3	1 December 2005
JAR-27, SMALL ROTORCRAFT (Basic Code FAR Part 27)	Amendment 6	1 December 2007
JAR-29, LARGE ROTORCRAFT (Basic Code FAR Part 29)	Amendment 6	1 December 2007
JAR-36, AIRCRAFT NOISE (Basic Code ICAO Annex 16, vol. I)	Amendment 2	1 February 2007
JAR-39, AIRWORTHINESS DIRECTIVES (No Basic Code)	Issued	1 January 2003
JAR-66, CERTIFYING STAFF MAINTENANCE (No Basic Code)	Amendment 2	1 February 2007
JAR-145, APPROVED MAINTENANCE ORGANISATIONS (No Basic Code)	Amendment 7	1 February 2007
JAR-147, APPROVED MAINTENANCE TRAINING/ EXAMINATIONS (No Basic Code)	Amendment 3	1 February 2007
JAR-APU, AUXILIARY POWER UNITS (Basic Code TSO c77A dated 20th July, 1981)	Amendment 5	1 February 2007
JAR-E, ENGINES (Basic Code BCAR Section C)†	Amendment 14	1 February 2007
JAR-M CONTINUING AIRWORTHINESS	Initial Issue	1 December 2007
JAR-P, PROPELLERS (Basic Code BCAR Section C)†	Amendment 9	1 February 2007
JAR-TSO, JOINT TECHNICAL STANDARD ORDERS (No Basic Code)	Amendment 8	1 February 2007

†No amendments are now produced for these Basic Codes as the JAR Codes have been accepted in their own right and therefore they will be the only documents which are updated periodically.

JAR-AWO, ALL WEATHER OPERATIONS (No Basic Code)	Amendment 4	1 February 2007
JAR-VLA, VERY LIGHT AEROPLANES (No Basic Code)	Amendment 2	1 February 2007
[JAR-OPS 1, COMMERCIAL AIR TRANSPORTATION (AEROPLANES) (Basic Code ICAO Annex 6, Part 1) **[Effective 16 July 2008]**	Amendment 14	1 May 2008**]**
JAR-OPS 3, COMMERCIAL AIR TRANSPORTATION (HELICOPTERS) (Basic Code ICAO Annex 6, Part III)	Amendment 5	1 July 2007
JAR-FCL 1, FLIGHT CREW LICENSING (AEROPLANE) (Basic Code ICAO Annex 1)	Amendment 7	1 December 2006
JAR-FCL 2, FLIGHT CREW LICENSING (HELICOPTER) (Basic Code ICAO Annex 1)	Amendment 6	1 February 2007
JAR-FCL 3, FLIGHT CREW LICENSING (MEDICAL) (Basic Code ICAO Annex 1)	Amendment 5	1 December 2006
JAR-FCL 4, FLIGHT CREW LICENSING (FLIGHT ENGINEERS) (Basic Code ICAO Annex 1)	Amendment 3	1 September 2005
[JAR-FSTD A, AEROPLANE FLIGHT SIMULATION TRAINING DEVICES **[Effective 1 August 2008]**	Issued	1 May 2008**]**
JAR-STD 1A, AEROPLANE FLIGHT SIMULATORS (No Basic Code) **[Expires 1 August 2008]**	Amendment 3	1 July 2003
JAR-STD 2A, AEROPLANE FLIGHT TRAINING DEVICES (No Basic Code) **[Expires 1 August 2008]**	Issued	1 July 1999
JAR-STD 3A, FLIGHT & NAVIGATION PROCEDURES TRAINERS (No Basic Code) **[Expires 1 August 2008]**	Change 1	1 June 1999
JAR-STD 4A, BASIC INSTRUMENT TRAINING DEVICES (No Basic Code) **[Expires 1 August 2008]**	Issued	1 May 2002
[JAR-FSTD H, HELICOPTER FLIGHT SIMULATION TRAINING DEVICES **[Effective 1 August 2008]**	Issued	1 May 2008**]**
JAR-STD 1H, HELICOPTER FLIGHT SIMULATORS (No Basic Code) **[Expires 1 August 2008]**	Issued	1 April 2001
JAR-STD 2H, HELICOPTER FLIGHT TRAINING DEVICES (No Basic Code) **[Expires 1 August 2008]**	Issued	1 September 2003
JAR-STD 3H, HELICOPTER FLIGHT & NAVIGATION PROCEDURES TRAINERS (No Basic Code) **[Expires 1 August 2008]**	Issued	1 May 2002
JAR-MMEL/MEL, MASTER MINIMUM EQUIPMENT LIST / MINIMUM EQUIPMENT LIST (No Basic Code)	Amendment 1	1 August 2005
GAI-20, JOINT ADVISORY MATERIAL – ADVISORY CIRCULAR JOINT (No Basic Code)	Amendment 3	1 February 2007
JAR-34, AIRCRAFT ENGINE EMISSIONS (ICAO Annex 16 Volume II)	Amendment 2	1 February 2007
JAR-VLR, VERY LIGHT HELICOPTERS (No Basic Code)	Amendment 2	1 February 2007

†No amendments are now produced for these Basic Codes as the JAR Codes have been accepted in their own right and therefore they will be the only documents which are updated periodically.

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Joint Aviation Requirements

JAR–FSTD H

Helicopter Flight Simulation Training Devices

Joint Aviation Authorities

Joint Aviation Requirements

JAR–FSTD H

Helicopter
Flight Simulation Training Devices

Initial issue
01 May 2008

Printed and distributed by Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112, U S A on behalf of the Joint Aviation Authorities Committee.

The members of the Joint Aviation Authorities Committee are representatives of the Civil Aviation Authorities of the countries that have signed the 'Arrangements Concerning the Development and the Acceptance of Joint Aviation Requirements'. A list of these countries is kept by European Civil Aviation Conference, 3 bis Villa Emile Bergerat, 92522 NEUILLY SUR SEINE Cedex, France.*

Further copies of the Joint Aviation Requirements can be purchased from IHS, Inc. , whose world-wide offices are listed on the JAA website (www.jaa.nl) and IHS website (www.global.ihs.com).

For electronic versions of Joint Aviation Authorities Documents please refer to the website of IHS, Inc. on www.ihs.com, where you will find information on how to order.

Enquiries regarding the contents should be addressed to the JAA, Saturnusstraat 40-44, PO Box 3000, 2130 KA HOOFDDORP, The Netherlands (publications@jaat.eu).

*These countries are:

Albania, Armenia, Austria, [Azerbaijan], Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Aviation Safety Agency, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Republic of Moldova, **[**Republic of Georgia**]**, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, & United Kingdom

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JAR–FSTD H

HELICOPTER FLIGHT SIMULATION TRAINING DEVICES

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JAR–FSTD H

HELICOPTER FLIGHT SIMULATION TRAINING DEVICES

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FOREWORD

1 The Civil Aviation Authorities of certain European countries have agreed common comprehensive and detailed aviation requirements, referred to as Joint Aviation Requirements (JARs), with a view to minimising Type Certification problems on joint ventures, to facilitate the export and import of aviation products, to make it easier for maintenance carried out in one European country to be accepted by the Civil Aviation Authority in another European country and to regulate commercial air transport operations.

2 JARs are recognised by the Civil Aviation Authorities of participating countries as an acceptable basis for showing compliance with their national codes.

3 The content has been prepared using the expertise available in this field and added to where necessary by making use of existing European regulations and the Federal Aviation Requirements of the United States of America where acceptable.

4 JAR–FSTD H is issued with no National Variants. It may be felt that the document does not contain all of the detailed compliance and interpretative information which some Civil Aviation Authorities and Industry organisations would like to see. However, it is accepted that JAR–FSTD H should be applied in practice and the lessons learned embodied in future amendments. The Civil Aviation Authorities of the JAA are therefore committed to early amendment in the light of experience.

5 Future development of the requirements of JAR–FSTD H, including the commitment in Paragraph 4, will be in accordance with the JAA's Notice of Proposed Amendment (NPA) procedures. These procedures allow for the amendment of JAR–FSTD H to be proposed by any organisation or person.

6 The Civil Aviation Authorities have agreed they should not unilaterally initiate amendment of their national codes without having made a proposal for amendment of JAR–FSTD H in accordance with the agreed procedure.

7 Definitions and abbreviations of terms used in JAR–FSTD H that are considered generally applicable are contained in JAR–1, Definitions and Abbreviations. However, definitions and abbreviations of terms used in JAR–FSTD H that are specific to a Subpart of JAR–FSTD H are normally given in the Subpart concerned or, exceptionally, in the associated compliance or interpretative material.

8 Amendments to the text in JAR–FSTD H are issued as Replacement Pages. These show an effective date and have the same status and applicability as JAR–FSTD H from that date.

9 New, amended and corrected text will be enclosed within heavy brackets until a subsequent Amendment' is issued.

10 Comment/Response documents developed following Notices of Proposed Amendment (NPA) consultation have been produced by the JAA and are published on the JAA Internet Site: www.jaa.nl. Readers can also apply to Central JAA for copies of specific Comment/Response Documents as required.

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JOINT AVIATION REQUIREMENTS

CHECK LIST OF PAGES

JAR-FSTD H - HELICOPTER FLIGHT SIMULATION TRAINING DEVICES

Initial issue dated 01 May 2008

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PREAMBLE

JAR–FSTD H

Initial Issue

JAR–FSTD H comprises 3 Subparts (A, B and C) in Section 1, and 2 Subparts (B and C) in Section 2.

JAR-FSTD H is a simple amalgamation of JAR STD 1H, 2H and 3H into one document.

Section 1

Subpart A

Applicability to all Helicopter FSTD

Subpart B

Terminology for all Helicopter FSTD and implementation

Subpart C

Basic regulatory processes
Table of Standards in Appendix 1 to JAR-FSTD H.030 contains the standard for all devices

Section 2

Subpart B

Terminology and Abbreviations rationalised and harmonised with Helicopter STD standards documents.

Subpart C

Regulatory Processes combined.
Table of Objective Tests (ACJ No. 1 to JAR-FSTD H.030) contains the testing requirements for all devices.
Table of Functions and Subjective Tests (ACJ No. 1 to JAR-FSTD H.030) contains the testing requirements for all devices

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SECTION 1 – REQUIREMENTS

1 GENERAL

1.1 This Section contains the requirements for helicopter Flight Simulation Training Devices.

2 PRESENTATION

2.1 The requirements of JAR–FSTD H are presented in two columns on loose pages, each page being identified by the date of issue and the Amendment number under which it is amended or reissued.

2.2 Sub-headings are in italic typeface.

2.3 Explanatory Notes not forming part of the requirements appear in smaller typeface.

2.4 New, amended and corrected text will be enclosed within heavy brackets until a subsequent 'Amendment' is issued.

2.5 After each paragraph, the various changes and amendments, if any since the initial issue, are indicated together with their date of issue.

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SUBPART A - APPLICABILITY

JAR–FSTD H.001 Applicability

JAR–FSTD H as amended applies to those persons, organisations or enterprises (Flight Simulation Training Devices (FSTD) operators) seeking initial qualification of FSTDs.

The version of JAR-FSTD H agreed by the Authority and used for issue of the initial qualification shall be applicable for future recurrent qualifications of the FSTD unless recategorised.

FSTD users shall also gain approval to use the FSTD as part of their approved training programmes despite the fact that the FSTD has been previously qualified.

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SUBPART B – GENERAL

JAR–FSTD H.005 Terminology
(See ACJ to FSTD H.005)

Because of the technical complexity of FSTD qualification, it is essential that standard terminology is used throughout. The following principal terms and abbreviations shall be used in order to comply with JAR–FSTD (H). Further terms and abbreviations are contained in ACJ to FSTD H.005.

(a) *Flight Simulation Training Device (FSTD)*. A training device which is a Full Flight Simulator (FFS), a Flight Training Device (FTD), a Flight & Navigation Procedures Trainer (FNPT).

(b) *Full Flight Simulator (FFS)*. A full size replica of a specific type or make, model and series helicopter flight deck, including the assemblage of all equipment and computer programmes necessary to represent the helicopter in ground and flight operations, a visual system providing an out of the flight deck view, and a force cueing motion system. It is in compliance with the minimum standards for FFS Qualification.

(c) *Flight Training Device (FTD)*. A full size replica of a specific helicopter type's instruments, equipment, panels and controls in an open flight deck area or an enclosed helicopter flight deck, including the assemblage of equipment and computer software programmes necessary to represent the helicopter in ground and flight conditions to the extent of the systems installed in the device. It does not require a force cueing motion or visual system. It is in compliance with the minimum standards for a specific FTD Level of Qualification.

(d) *Flight and Navigation Procedures Trainer (FNPT)*. A training device which represents the flight deck or cockpit environment including the assemblage of equipment and computer programmes necessary to represent a helicopter in flight operations to the extent that the systems appear to function as in a helicopter. It is in compliance with the minimum standards for a specific FNPT Level of Qualification.

(e) *Other Training Device (OTD)*. A training aid other than FFS, FTD or FNPT which provides for training where a complete flight deck environment is not necessary.

(f) *Flight Simulation Training Device User Approval (FSTD User Approval)*. The extent to which an FSTD of a specified Qualification Level may be used by persons, organisations or enterprises as approved by the Authority. It takes

JAR-FSTD H.005(f) (continued)

account of helicopter to FSTD differences and the operating and training ability of the organization.

(g) *Flight Simulation Training Device Operator (FSTD operator)*. That person, organisation or enterprise directly responsible to the Authority for requesting and maintaining the qualification of a particular FSTD.

(h) *Flight Simulation Training Device User (FSTD User)*. The person, organization or enterprise requesting training, checking and testing credits through the use of an FSTD.

(i) *Flight Simulation Training Device Qualification (FSTD Qualification)*. The level of technical ability of an FSTD as defined in the compliance document.

(j) *Qualification Test Guide (QTG)*. A document designed to demonstrate that the performance and handling qualities of an FSTD agree within prescribed limits with those of the helicopter and that all applicable regulatory requirements have been met. The QTG includes both the helicopter and FSTD data used to support the validation.

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SUBPART C – HELICOPTER FLIGHT SIMULATION TRAINING DEVICES

JAR–FSTD H.015 Application for FSTD Qualification
(See ACJ No. 1 to JAR-FSTD H.015)
(See ACJ No. 2 to JAR-FSTD H.015)

(a) The FSTD operator requiring evaluation of a FFS, FTD, or FNPT shall apply to the Authority giving 3 months notice. In exceptional cases this period may be reduced to one month at the discretion of the Authority.

(b) An FSTD Qualification Certificate will be issued following satisfactory completion of an evaluation of the FFS, FTD or FNPT by the Authority.

JAR–FSTD H.020 Validity of FSTD Qualification
(See ACJ to JAR-FSTD H.020)

(a) A FSTD qualification is valid for 12 months unless otherwise specified by the Authority.

(b) A FSTD qualification revalidation can take place at any time within the 60 days prior to the expiry of the validity of the qualification document. The new period of validity shall continue from the expiry date of the previous qualification document.

(c) The Authority shall refuse, revoke, suspend or vary a FSTD qualification, if the provisions of JAR–FSTD H are not satisfied.

JAR–FSTD H.025 Rules Governing FSTD Operators
(See ACJ No. 1 to JAR-FSTD H.025)
(See ACJ No. 2 to JAR-FSTD H.025)

The FSTD operator shall demonstrate his capability to maintain the performance, functions and other characteristics specified for the FSTD Qualification Level as follows:

(a) Quality System

(1) A Quality System shall be established and a Quality Manager designated to monitor compliance with, and the adequacy of, procedures required to ensure the maintenance of the Qualification Level of

JAR-FSTD H.025(a) (continued)

FSTDs. Compliance monitoring shall include a feedback system to the Accountable Manager to ensure corrective action as necessary.

(2) The Quality System shall include a Quality Assurance Programme that contains procedures designed to verify that the specified performance, functions and characteristics are being conducted in accordance with all applicable requirements, standards and procedures.

(3) The Quality System and the Quality Manager shall be acceptable to the Authority.

(4) The Quality System shall be described in relevant documentation.

(b) Updating. A link shall be maintained between the operator's organization, the Authority and the relevant manufacturers to incorporate important modifications, especially:

(1) Helicopter modifications which are essential for training and checking shall be introduced into all affected FSTDs whether or not enforced by an airworthiness directive.

(2) Modification of FSTDs, including motion and visual systems (where applicable):

(i) When essential for training and checking, FSTD operators shall update their FSTDs (for example in the light of data revisions). Modifications of the FSTD hardware and software which affect handling, performance and systems operation or any major modifications of the motion or visual system shall be evaluated to determine the impact on the original qualification criteria. FSTD operators shall prepare amendments for any affected validation tests. The FSTD operator shall test the FSTD to the new criteria.

(ii) The Authority shall be advised in advance of any major changes to determine if the tests carried out by the FSTD operator are satisfactory. A special evaluation of the FSTD may be necessary prior to returning it to training following the modification.

(c) Installations. Ensure that the FSTD is housed in a suitable environment which supports safe and reliable operation.

JAR-FSTD H.025(c) (continued)

(1) The FSTD operator shall ensure that the FSTD and its installation comply with the local regulations for health and safety. However, as a minimum all FSTD occupants and maintenance personnel shall be briefed on FSTD safety to ensure that they are aware of all safety equipment and procedures in the FSTD in case of emergency.

(2) The FSTD safety features such as emergency stops and emergency lighting shall be checked at least annually and recorded by the FSTD operator.

(d) Additional Equipment. Where additional equipment has been added to the FSTD even though not required for qualification, it will be assessed to ensure that it does not adversely affect the quality of training. Therefore any subsequent modification, removal or unserviceability of such equipment could affect the qualification of the device.

JAR–FSTD H.030 Requirements for FSTD qualified on or after 1 August 2008

(See Appendix 1 to JAR–FSTD H.030)
(See ACJ No. 1 to JAR-FSTD H.030)
(See ACJ No. 2 to JAR-FSTD H.030)
(See ACJ No. 3 to JAR-FSTD H.030)
(See ACJ No. 4 to JAR-FSTD H.030)
(See ACJ No. 5 to JAR-FSTD H.030)

(a) Any FSTD submitted for initial evaluation on or after 1 August 2008 will be evaluated against applicable JAR-FSTD H criteria for the Qualifications levels for which qualification has been applied. Recurrent evaluations of a FSTD will be based on the same version of JAR-FSTD H that was applicable for its initial evaluation. An upgrade will be based upon the currently applicable version of JAR-FSTD H.

(b) A FSTD shall be assessed in those areas which are essential to completing the flight crew member training, testing and checking process as applicable.

(c) The FSTD shall be subjected to:

(1) Validation tests and

JAR-FSTD H.030(c) (continued)

(2) Functions & subjective tests

(d) Data shall be of a standard that satisfies the Authority before the FSTD can gain a Qualification Level.

(e) The FSTD operator shall submit a QTG in a form and manner which is acceptable to the Authority.

(f) The QTG will only be approved after completion of an initial or upgrade evaluation, and when all the discrepancies in the QTG have been addressed to the satisfaction of the Authority. After inclusion of the results of the tests witnessed by the Authority, the approved QTG becomes the Master QTG (MQTG), which is the basis for the FSTD qualification and subsequent recurrent FSTD evaluations

(g) The FSTD operator shall:

(1) Run the complete set of tests contained within the MQTG progressively between each annual evaluation by the Authority. Results shall be dated and retained in order to satisfy both the FSTD operator and the Authority that FSTD standards are being maintained; and

(2) Establish a Configuration Control System to ensure the continued integrity of the hardware and software of the qualified FSTD.

JAR-FSTD H.031 Requirements for FFS qualified on or after 1 April 2001 and before 1 August 2008

Any FFS submitted for initial evaluation on or after 1 April 2001 and before 1 August 2008, shall automatically be granted an equivalent qualification under JAR-FSTD H with effect from the re-evaluation conducted at the end of the current validity period. This re-evaluation, and all future re-evaluations, will be conducted in accordance with the requirements of the same version of JAR-STD 1H, which was applicable for its last evaluation prior to implementation of JAR-FSTD H. Any upgrade will be based on the currently applicable version of JAR-FSTD H.

JAR-FSTD H.032 Requirements for Flight Training Devices (FTD) qualified on or after 1 January 2004 and before 1 August 2008

Any FTD submitted for initial evaluation on or after 1 January 2004 and before 1 August 2008, shall automatically be granted an equivalent qualification under JAR-FSTD H with effect from the re-evaluation conducted at the end of the current validity period. This re-evaluation, and all future re-evaluations, will be conducted in accordance with the requirements of the same version of JAR-STD 2H, which was applicable for its last evaluation prior to implementation of JAR-FSTD H. Any upgrade will be based on the currently applicable version of JAR-FSTD H.

JAR-FSTD H.033 Requirements for Flight & Navigation Procedures Trainers (FNPT) qualified on or after 1 January 2003 and before 1 August 2008

Any FNPT submitted for initial evaluation on or after 1 January 2003 and before 1 August 2008, shall automatically be granted an equivalent qualification under JAR-FSTD H with effect from the re-evaluation conducted at the end of the current validity period. This re-evaluation, and all future re-evaluations, will be conducted in accordance with the requirements of the same version of JAR-STD 3H, which was applicable for its last evaluation prior to implementation of JAR-FSTD H. Any upgrade will be based on the currently applicable version of JAR-FSTD H.

JAR–FSTD H.035 Requirements for Full Flight Simulators approved or qualified before 1 April 2001
(See ACJ to JAR-FSTD H.035)

(a) FFS approved or qualified in accordance with national regulations of JAA Member States before 1 April 2001 will either be recategorised or will continue to maintain their approval under the Grandfather Rights provision, in accordance with sub-paragraphs (c) and (d) below. For FFS which are not re-categorized, maximum credit shall under no

circumstances exceed originally issued National credits.

(b) FFS's neither recategorised nor with an approval maintained under the Grandfather Rights provision, will be qualified in accordance with JAR–FSTD H.030.

(c) FFS that are not recategorised but that have a primary reference document used for their testing may be qualified by the Authority to an equivalent JAR–FSTD H Qualification Level, either AG, BG, CG or DG. An upgrade requires the recategorisation of the FFS.

(1) To gain and maintain an equivalent Qualification Level, these FFS shall be assessed in those areas which are essential to completing the flight crew member training and checking process, as applicable.

(2) The FFS shall be subjected to:

(i) Validation tests; and

(ii) Functions and subjective tests.

(d) FFS that are not recategorised and that do not have a primary reference document used for their testing, shall be qualified by special arrangement. Such FFS will be issued with a Special Category and shall be subjected to functions and subjective tests corresponding to those detailed within this document. In addition any previously recognised validation test shall be used.

JAR–FSTD H.036 Requirements for Flight Training Devices approved or qualified before 1 January 2004

No longer applicable.

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JAR–FSTD H.037 Requirements for Flight Navigation Procedures Trainers approved or qualified before 1 January 2003
(See ACJ to JAR-FSTD H.037)

(a) FNPTs or devices approved or qualified in accordance with national regulations of JAA Members States before 1 January 2003 will either be recategorised or will continue to maintain their approval under the Grandfather Rights provision, in accordance with sub-paragraphs (c) and (d) below. Grandfather Rights shall cease to exist on the 1st January 2009. For FNPT which are not recategorised maximum credits shall under no circumstances exceed originally issued National credits.

(b) Recategorised FNPTs will be qualified in accordance with JAR-FSTD H.030.

(c) FNPTs that are not recategorised, but that have a primary reference document used for their testing, may continue under previous authorisation, provided that they continue to comply with the primary reference document.

(1) To gain and maintain their equivalent qualification level, these FNPTs shall be assessed in those areas which are essential to completing the flight crew member training process, as applicable.

(2) The devices shall be subjected to:

(i) Validation tests and

(ii) Functions and subjective tests.

(d) FNPTs that are not recategorised and that do not have a primary reference document used for their testing shall be qualified by special arrangement. Such FNPTs will be issued with a Special Category and shall be subjected to Functions and Subjective Tests corresponding to those detailed within this document. In addition any previously recognized Validation tests shall be used.

JAR–FSTD H.040 Changes to qualified FSTD

(a) Requirement to notify major changes to a FSTD. The operator of a qualified FSTD shall inform the Authority of proposed major changes such as:

JAR-FSTD H.040(a) (continued)

(1) Helicopter modifications which could affect FSTD qualification.

(2) FSTD hardware and or software modifications which could affect the handling qualities, performance or system representations.

(3) Relocation of the FSTD; and

(4) Any deactivation of the FSTD.

The Authority may complete a special evaluation following major changes or when a FSTD appears not to be performing at its initial Qualification Level.

(b) Upgrade of a FSTD. A FSTD may be upgraded to a higher Qualification Level. Special evaluation is required before the award of a higher Level of Qualification.

(1) If an upgrade is proposed the FSTD operator shall seek the advice of the Authority and give full details of the modifications. If the upgrade evaluation does not fall upon the anniversary of the original qualification date, a special evaluation is required to permit the FSTD to continue to qualify even at the previous Qualification Level.

(2) In the case of a FSTD upgrade, an FSTD operator shall run all validation tests for the requested Qualification Level. Results from previous evaluations shall not be used to validate FSTD performance for the current upgrade.

(c) Relocation of a FSTD

(1) In instances where a FSTD is moved to a new location, the Authority shall be advised before the planned activity along with a schedule of related events.

(2) Prior to returning the FSTD to service at the new location the FSTD operator shall perform at least one third of the validation tests and all functions and subjective tests to ensure that the FSTD performance meets its original qualification standard. A copy of the test documentation shall be retained together with the FSTD records for review by the Authority.

(3) An evaluation of the FSTD in accordance with its original JAA qualification criteria shall be at the discretion of the Authority.

(d) Deactivation of a currently qualified FSTD

JAR-FSTD H.040(d) (continued)

(1) If a FSTD operator plans to remove a FSTD from active status for prolonged periods, the Authority shall be notified and suitable controls established for the period during which the FSTD is inactive.

(2) The FSTD operator shall agree a procedure with the Authority to ensure that the FSTD can be restored to active status at its original Qualification Level.

JAR–FSTD H.045 Interim FSTD Qualification
(See ACJ to JAR-FSTD H.045)

(a) In the case of new helicopter programmes, special arrangements shall be made to enable an interim Qualification Level to be achieved.

(b) For Full Flight Simulators, an interim Qualification Level will only be granted at levels A, B or C

(c) Requirements, details relating to the issue, and the period of validity of an interim Qualification Level will be decided by the Authority.

JAR–FSTD H.050 Transferability of FSTD Qualification

When there is a change of FSTD operator:

(a) The new FSTD operator shall advise the Authority in advance in order to agree upon a plan of transfer of the FSTD.

(b) At the discretion of the Authority, the FSTD shall be subject to an evaluation in accordance with its original JAA qualification criteria.

(c) Provided that the FSTD performs to its original standard, its original Qualification Level shall be restored. Revised user approval(s) may also be required.

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Appendix 1 to JAR-FSTD H.030
Flight Simulation Training Device Standards General

This appendix describes the minimum Full Flight Simulator (FFS), Flight Training Device (FTD) and Flight Navigation Procedures Trainer (FNPT) requirements for qualifying devices to the required Qualification Levels. Certain requirements included in this section shall be supported with a statement of compliance (SOC) and, in some designated cases, an objective test. The SOC will describe how the requirement was met. The test results shall show that the requirement has been attained. In the following tabular listing of FSTD standards, statements of compliance are indicated in the compliance column.

For FNPT use in Multi-Crew Co-operation (MCC) training the general technical requirement are expressed in the MCC column with additional systems, instrumentation and indicators as required for MCC training and operation.

For MCC (Multi Crew Co-operation) minimum technical requirements are as for Level II or III, with the following additions or amendments:

1	Multi engine and multi pilot helicopter
2	Performance reserves, in case of an engine failure, to be in accordance with CAT. A criteria.
3	Anti icing or de-icing systems
4	Fire detection / suppression system
5	Dual controls
6	Autopilot with upper modes
7	2 VHF transceivers
8	2 VHF NAV receivers (VOR, ILS, DME)
9	1 ADF receiver
10	1 Marker receiver
11	1 transponder
12	Weather radar

The following indicators shall be located in the same positions on the instrument panels of both pilots:	
1	Airspeed
2	Flight attitude
3	Altimeter and radio altimeter
4	HSI
5	Vertical speed
6	ADF
7	VOR, ILS, DME
8	Marker indication
9	Stop watch

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
a.1	A flight deck that is a full-scale replica of the helicopter simulated. Additional required crewmember duty stations and those required bulkheads aft of the pilot seats are also considered part of the cockpit and shall replicate the helicopter.	✓	✓	✓	✓		✓	✓					
	A flight deck that replicates the helicopter.					✓			✓	✓	✓	✓	
a.2	The flight deck, including the instructor's station is fully enclosed.	✓	✓	✓	✓								
	A flight deck, including the instructor's station that is sufficiently closed off to exclude distractions.					✓	✓	✓	✓	✓	✓	✓	
b.1	Full size panels with functional controls, switches, instruments and primary and secondary flight controls, which shall be operating in the correct direction and with the correct range of movement.	✓	✓	✓	✓	✓	✓	✓					For FTD Level 1 as appropriate for the replicated system The use of electronically displayed images with physical overlay incorporating operable switches, knobs and buttons may be acceptable. This option is not acceptable for analogue instruments in FFS.
	Functional controls, switches, instruments and primary and secondary flight controls sufficient for the training events to be accomplished, shall be located in a spatially correct area of the flight deck.								✓	✓	✓	✓	The use of electronically displayed images with physical overlay incorporating operable switches, knobs and buttons is acceptable.

FSTD STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
1.1 General		**A**	**B**	**C**	**D**	**1**	**2**	**3**	**I**	**II**	**III**	**MCC**	
c.1	Lighting for panels and instruments shall be as per the helicopter.	✓	✓	✓	✓		✓	✓					
	Lighting for panels and instruments shall be sufficient for the training events					✓			✓	✓	✓	✓	
c.2	Flight deck ambient lighting environment shall be dynamically consistent with the visual display and sufficient for the training event.			✓	✓								
	The ambient lighting should provide an even level of illumination which is not distracting to the pilot.	✓	✓				✓	✓		✓	✓	✓	
d.1	Relevant flight deck circuit breakers shall be located as per the helicopter and shall function accurately when involved in operating procedures or malfunctions requiring or involving flight crew response.	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
e.1	Effect of aerodynamic changes for various combinations of airspeed and power normally encountered in flight, including the effect of change in helicopter attitude, aerodynamic and propulsive forces and moments, altitude, temperature, mass, centre of gravity location and configuration.	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	Effects of C_g, mass and configuration changes are not required for FNPT Level I.
	Aerodynamic and environment modelling shall be sufficient to permit accurate systems operation and indication.					✓							

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
e.2	Aerodynamic modelling which includes ground effect, effects of airframe and rotor icing (if applicable), aerodynamic interference effects between the rotor wake and fuselage, influence of the rotor on control and stabilization systems, and representations of nonlinearities due to sideslip, vortex ring and retreating blade stall.			✓	✓		✓	✓		✓	✓	✓	
f.1	Validation flight test data shall be used as the basis for flight and performance and systems characteristics. Representative/generic aerodynamic data tailored to the helicopter with fidelity sufficient to meet the objective tests and sufficient to permit accurate system operation and indication.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Aerodynamic data need not be necessarily based on flight test data.
g.1	All relevant flight deck instrument indications automatically respond to control movement by a crewmember, helicopter performance, or external simulated environmental effects upon the helicopter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

FSTD STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
1.1 General		**A**	**B**	**C**	**D**	**1**	**2**	**3**	**I**	**II**	**III**	**MCC**	
h.1	All relevant communications, navigation, caution and warning equipment shall correspond to that installed in the helicopter. All simulated navigation aids within range shall be usable without restriction. Navigational data shall be capable of being updated.	✓	✓	✓	✓	✓	✓	✓					For FTD 1 applies where the appropriate systems are replicated.
h.2	Navigation equipment corresponding to that of a helicopter, with operation within the tolerances typically applied to the airborne equipment. This shall include communication equipment (interphone and air/ground communications systems).								✓	✓	✓	✓	
h.3	Navigational data with the corresponding approach facilities. Navigation aids should be usable within range without restriction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	For FFSs and FTDs the navigation database should be updated within 28 days. For FNPTs complete navigational data for at least 5 different European airports with corresponding precision and non-precision approach procedures including current updating within a period of 3 months.
i.1	In addition to the flight crewmember stations, at least two suitable seats for the instructor and an additional observer shall be provided permitting adequate vision to the crewmembers' panel and forward windows. Observer seats need not represent those found in the helicopter but shall be adequately secured to the floor of the flight simulator, fitted with positive restraint devices and be	✓	✓	✓	✓								The Authority will consider options to this standard based on unique cockpit configurations. Any additional seats installed shall be equipped with similar safety provisions.

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
	of sufficient integrity to safely restrain the occupant during any known or predicted motion system excursion.												
i.2	Crewmember seats shall afford the capability for the occupants to be able to achieve the design eye reference position. In addition to the flight crewmember stations, at least two suitable seats for the instructor and an additional observer shall be provided permitting adequate vision to the crewmembers' panel and forward windows.					✓	✓	✓	✓	✓	✓	✓	The instructor's and observer's seats need not represent those found in the helicopter.

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
j.1	FFS systems shall simulate the applicable helicopter system operation, both on the ground and in flight. Systems shall be operative to the extent that normal, abnormal, and emergency operating procedures appropriate to the simulator application can be accomplished. Once activated, proper system operation shall result from system management by the flight crew and not require input from instructor controls.	✓	✓	✓	✓								
j.2	FTD systems represented shall be fully operative to the extent that normal, abnormal and emergency operating procedures can be accomplished. Once activated, proper system operation shall result from system management by the flight crew and not require input from instructor controls.					✓	✓	✓					
j.3	The systems should be operative to the extent that it should be possible to perform normal, abnormal, and emergency operations appropriate to a helicopter as required for training. Once activated, proper systems operations should result from the system management by the crewmember and not require any further input from the instructor's controls.								✓	✓	✓	✓	
k.1	The instructor shall be able to control system variables and insert abnormal or emergency conditions into the helicopter systems. Independent freeze and reset facilities shall be provided.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	FNPT I: applicable only to enable the instructor to carry out selective failure of basic flight instruments and navigation equipment. For FNPT Level I: Ability to set the FNPT to minimum IMC speed or above

FSTD STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
1.1 General		**A**	**B**	**C**	**D**	**1**	**2**	**3**	**I**	**II**	**III**	**MCC**	
I.1	Control forces and control travel which correspond to that of the replicated helicopter. Control forces shall react in the same manner as in the helicopter under the same flight conditions.	✓	✓	✓	✓								For Level A only static control force characteristics need to be tested.
	Control forces and control travel shall be representative of the replicated helicopter under the same flight conditions as in the helicopter..					✓	✓	✓					For FTD level 1 as appropriate for the system training required
	Control forces and control travel shall broadly correspond to that of a helicopter.								✓				Only static control force characteristics need to be tested.
	Control forces and control travels shall respond in the same manner under the same flight conditions as in a helicopter.									✓	✓	✓	Only static control force characteristics need to be tested.
I.2	Cockpit control dynamics, which replicate the helicopter simulated. Free response of the controls shall match that of the helicopter within the given tolerance. Initial and upgrade evaluation will include control free response (cyclic, collective, and pedal) measurements recorded at the controls. The measured responses shall correspond to those of the helicopter in ground operations, hover, climb, cruise, and auto-rotation.		✓	✓	✓		✓	✓					For helicopters with irreversible control systems, measurements may be obtained on the ground. Engineering validation or helicopter manufacturer rationale will be submitted as justification for ground test or to omit a configuration. For FFS requiring static and dynamic tests at the controls, special test fixtures will not be required during the initial evaluations if the FSTD operator's QTG shows both test fixture results and alternate test method results, such as computer data plots, which were obtained concurrently. Use of the alternate method during initial evaluation may then satisfy this test requirement. FTD Level 2 data can be representative/generic and need not necessarily be based on flight test data.

Appendix 1 to JAR-FSTD H.030 (continued)

m.1	Ground handling and aerodynamic programming to include the following: Ground effect - hover and transition IGE. (Ground reaction - reaction of the helicopter upon contact with the landing surface during landing to include strut deflections, tire or skid friction, side forces, and other appropriate data, such as weight and speed, necessary to identify the flight condition and configuration. Ground handling characteristics – control inputs to include braking, deceleration turning radius and the effects of crosswind. Ground handling and aerodynamic ground effects models should be provided to enable lift-off, hover, and touch down effects to be simulated and harmonized with the sound and visual system. Generic ground handling and aerodynamic ground effects models should be provided to enable lift-off, hover, and touch down effects to be simulated and harmonized with the sound and visual system.	✓	✓	✓						Level A can utilise generic simulation of ground effect and ground handling.

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
n.1	Instructor controls for												
	(i) Wind speed and direction	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
	(ii) Turbulence	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
	(iii) Other atmospheric models to support the required training.				✓			✓			✓	✓	Examples: Generic atmospheric models of local wind patterns around mountains and structures..
	(iv) Adjustment of cloud base and visibility.	✓	✓	✓	✓		✓	✓		✓	✓	✓	
	(v) Temperature and barometric pressure.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
o.1	Representative stopping and directional control forces for at least the following landing surface conditions based on helicopter related data, for a running landing. (i) Dry (ii) Wet (soft surface and hard surface) (iii) Icy (iv) Patchy Wet (v) Patchy Icy			✓	✓								
p.1	Representative brake and tire failure dynamics.			✓	✓								
q.1	Cockpit control dynamics, which replicate the helicopter simulated. Free response of the controls shall match that of the helicopter within the given tolerance. Initial and upgrade evaluation will include control free response (cyclic, collective, and pedal) measurements recorded at the controls. The measured responses shall correspond to those of the helicopter in ground operations, hover, climb,		✓	✓	✓		✓	✓		✓	✓	✓	For helicopters with irreversible control systems, measurements may be obtained on the ground. Engineering validation or helicopter manufacturer rationale will be submitted as justification for ground test or to omit a configuration. For FFS requiring static and dynamic tests at the controls, special test fixtures will not be required during the initial evaluations if the FSTD perator's QTG shows both test fixture results and alternate

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
	cruise, and auto-rotation.												test method results, such as computer data plots, which were obtained concurrently. Use of the alternate method during initial evaluation may then satisfy this test requirement. FTD Level 2 aerodynamic data can be representative/generic and need not necessarily be based on flight test data.
r.1	(1) Transport delay. Transport delay is the time between control input and the individual hardware (systems) responses. As an alternative, a Latency test may be used to demonstrate that the flight simulator system does not exceed the permissible delay.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	For FTD Level 1, only instrument response is required within a maximum permissible delay of 200 milliseconds For Level 'A' & 'B' FFS and Level 2 FTD the maximum permissible delay is 150 milliseconds For Level 'C' & 'D' FFS and Level 3 FTD the maximum permissible delay is 100 milliseconds
	(2) Latency. Relative response of the visual system, cockpit instruments and initial motion system response shall be coupled closely to provide integrated sensory cues. These systems shall respond to abrupt pitch, roll, and yaw inputs at the pilot's position within the permissible delay, but not before the time, when the helicopter would respond under the same conditions. Visual scene changes from steady state disturbance shall occur within the system dynamic response limit but not before the resultant motion onset.	✓	✓	✓	✓	✓	✓	✓					For FTD Level 1 and FNPT Level I, only instrument response is required within a maximum permissible delay of 200 milliseconds For Level 'A' & 'B' FFS, Level 2 FTD and FNPT Level II and III the maximum permissible delay is 150 milliseconds For Level 'C' & 'D' FFS and Level 3 FTD the maximum permissible delay is 100 milliseconds

FSTD STANDARDS 1.1 General		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
s.1	A means for quickly and effectively testing FSTD programming and hardware. This may include an automated system, which could be used for conducting at least a portion of the tests in the QTG. Self-testing for FSTD hardware and programming to determine compliance with the FSTD performance tests. Evidence of testing shall include FSTD number, date, time, conditions, tolerances, and the appropriate dependent variables portrayed in comparison with the helicopter standard	✓	✓	✓	✓		✓	✓			✓	✓	Recommended for FTD Level 1,FNPT Level I and II Automatic flagging of "out-of-tolerance" tests results is encouraged.
t.1	A system allowing for timely continuous updating of FSTD hardware and programming consistent with helicopter modifications.	✓	✓	✓	✓	✓	✓	✓					
u.1	The FSTD operator shall submit a Qualification Test Guide in a form and manner acceptable to the Authority. A recording system shall be provided that will enable the FSTD performance to be compared with QTG criteria.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
v.1	FSTD computer capacity, accuracy, resolution and dynamic response sufficient for the Qualification Level sought.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
w.1	Daily preflight documentation either in the daily log or in a location easily accessible for review.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

FSTD STANDARDS 1.2 Motion System		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
a.1	Motion cues as perceived by the pilot shall be representative of the helicopter, e.g. touchdown cues should be a function of the simulated rate of descent.	✓	✓	✓	✓								Motion tests to demonstrate that each axes onset cues are properly phased with pilot input and helicopter response.
b.1	A motion system: Having a minimum of 3 degrees of freedom (pitch, roll, heave) to accomplish the required task. 6 degrees of freedom synergistic platform motion system	✓	✓	✓	✓								The instructor's and observer's seats need not represent those found in the helicopter. For level B, a reduced motion performance envelope is acceptable.
c.1	A means of recording the motion response time as required	✓	✓	✓	✓								See para 1.1 (r.1) above.

Appendix 1 to JAR-FSTD H.030 (continued)

FSTD STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
	1.2 Motion System	**A**	**B**	**C**	**D**	**1**	**2**	**3**	**I**	**II**	**III**	**MCC**	
d.1	Special effects programming to include the following:	✓	✓	✓	✓								For level A it may be of a generic nature sufficient to accomplish the required tasks. See Appendix 4 to ACJ No. 1 to JAR-FSTD H.030 para 2.2 on Vibration Platforms for Helicopter FSTDs.
	(1) Runway rumble, oleo deflections, effects of groundspeed and uneven surface characteristics.												
	(2) Buffet due to translational lift.												
	(3) Buffet during extension and retraction of landing gear.												
	(4) Buffet due to high speed and retreating blade stall.												
	(5) Buffet due to vortex ring.												
	(6) Representative cues resulting from;												
	(i) touchdown												
	(ii) translational lift.												
	(7) Antitorque device ineffectiveness.												
	(8) Buffet due to turbulence.												

Appendix 1 to JAR-FSTD H.030 (continued)

FSTD STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
1.2 Motion System													
e.1	Characteristic vibrations/buffets that result from operation of the helicopter and which can be sensed in the cockpit. Simulated cockpit vibrations to include seat(s), flight controls and instrument panel(s), although these need not be tested independently.				✓								Statement of Compliance required. Tests required with recorded results which allow the comparison of relative amplitudes versus frequency in the longitudinal, lateral and vertical axes with helicopter data.. Steady state tests are acceptable. See Appendix 4 to ACJ No. 1 to JAR-FSTD H.030 para 2.2 on Vibration Platforms for Helicopter FSTDs.

FSTD STANDARDS 1.3 Visual System		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
a.1	Visual system capable of meeting all the standards of this paragraph and the respective paragraphs of validation tests as well as functions and subjective tests as applicable to the Level of Qualification requested by the FSTD operator.	✓	✓	✓	✓		✓	✓		✓	✓	✓	The choice of the display system and of the field of view requirements should fully consider the intended use of the FSTD. The balance between training and testing/checking may influence the choice and geometry of the display system. In addition the diverse operational requirements should be addressed.
b.1	Visual system capable of providing at least a 45 degree horizontal and 30 degree vertical field of view simultaneously for each pilot. Visual system capable of providing at least a 75 degrees horizontal and 40 degrees vertical field of view simultaneously for each pilot. "Continuous", cross-cockpit, minimum visual field of view providing each pilot with 150 degrees horizontal and 40 degrees vertical	✓	✓	✓			✓			✓		✓	A minimum of 75 degrees horizontal field of view on either side of the zero degree azimuth line relative to the helicopter fuselage is required.
b.2	"Continuous," cross-cockpit, minimum visual field of view providing each pilot with 150 degrees horizontal and 60 degrees vertical							✓			✓		A minimum of 75 degrees horizontal field of view on either side of the zero degree azimuth line relative to the helicopter fuselage is required. This will allow an offset per side of the horizontal field of view if required for the training. Where training tasks require extended fields of view beyond the 150 degrees x 60 degrees, then such extended fields of view should be provided.
b.3	."Continuous" cross cockpit, minimum visual field of view providing each pilot with180 degrees horizontal and 60 degrees vertical				✓								A minimum of 75 degrees of horizontal field of view on either side of zero degrees azimuth line relative to the helicopter fuselage is required. This will allow an offset per side of the horizontal field of view if required for the training. Where training tasks require extended fields of view beyond the 180 degrees x 60 degrees, then such extended fields of view shall be provided.

FSTD STANDARDS 1.3 Visual System		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
c.1	A means of recording the visual response time for the visual system shall be provided.	✓	✓	✓	✓		✓	✓		✓	✓	✓	
d.1	Visual cues to assess rate of change of height, translational displacements and rates, during takeoff and landing.	✓	✓										For Level 'A', Visual cueing sufficient to support changes in approach path by using FATO perspective
	Visual cues to assess rate of change of height, height AGL, translational displacements and rates, during takeoff, low altitude/low airspeed manoeuvring, hover, and landing.			✓	✓		✓	✓		✓	✓	✓	.
e.1	Test procedures to quickly confirm visual system colour, RVR, focus, intensity, level horizon, and attitude as compared with the specified parameters.	✓	✓	✓	✓		✓	✓		✓	✓	✓	Statement of compliance required. Test required
f.1	A minimum of 10 levels of occulting. This capability should be demonstrated by a visual model through each channel.			✓	✓		✓	✓		✓	✓	✓	Statement of compliance required. Test required
g.1	Surface (Vernier) resolution shall be demonstrated by a test pattern of objects shown to occupy a visual angle of not greater than 3 arc minutes in the visual display used on a scene from the pilot's eye point..			✓	✓		✓	✓		✓	✓	✓	Statement of compliance required. Test required
h.1	Lightpoint size shall not be greater than 6 arc minutes			✓	✓								This is equivalent to a light point resolution of 3 arc minutes.
	Lightpoint size shall not be greater than 8 arc minutes		✓				✓	✓		✓	✓	✓	This is equivalent to a light point resolution of 4 arc minutes.

Appendix 1 to JAR-FSTD H.030 (continued)

	FSTD STANDARDS	FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
	1.3 Visual System	A	B	C	D	1	2	3	I	II	III	MCC	
i.1	Daylight, dusk, and night visual scenes with sufficient scene content to recognise aerodromes, heliports, terrain, and major landmarks around the Final Approach and Take-off (FATO) area and to successfully accomplish low airspeed/low altitude manoeuvres to include lift-off, hover, translational lift, landing and touchdown.			✓	✓		✓	✓		✓	✓	✓	
j.1	A visual database sufficient to support the requirements, including		✓	✓	✓		✓	✓		✓	✓	✓	Generic database is acceptable only for FTDs and FNPTs.
	(i) Specific areas within the database needing higher resolution to support landings, take-offs and ground cushion exercises and training away from a heliport. Including elevated helipad, helidecks and confined areas												Where applicable
	(ii) For cross-country flights sufficient scene details to allow for ground to map navigation over a sector length equal to 30 minutes at an average cruise speed.												Where applicable
	(iii) For offshore airborne radar approaches (ARA), harmonized visual/radar representations of installations.												
	(iv) (For training in the use of Night Vision Goggles (NVG) a visual display with the ability to represent various scenes with the required levels of ambient light/colour.												Where applicable

FSTD STANDARDS 1.3 Visual System		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
k.1	Daylight, twilight (dusk/dawn) and night visual capability for system brightness and contrast ratio criteria as applicable for level of qualification sought. Night and Dusk scene	✓	✓	✓	✓		✓	✓		✓	✓	✓	The ambient lighting should provide an even level of illumination, which is not distracting to the pilot.
k.2	The visual system should be capable of producing: Full colour presentations. Full colour texture shall be used to enhance visual cue perception for illuminated landing surfaces.			✓	✓		✓	✓		✓	✓	✓	
k.3	The visual system should be capable of producing, as a minimum: (1) A scene content comparable in detail with that produced by 6,000 polygons for daylight and 1000 visible light points for night and dusk scenes for the entire visual system. (2) A scene content comparable in detail with that produced by 4,000 polygons for daylight and 5000 visible light points for night and dusk scenes for the entire visual system (3) A scene content comparable in detail with that produced by 6,000 polygons for daylight and 7000 visible light points for night and dusk scenes for the entire visual system.			✓	✓		✓	✓		✓	✓	✓	Statement of Compliance required. Test required. Freedom of apparent quantization and other distracting visual effects are also applicable for Levels A and B.
l.1	Surface contrast ratio: Demonstration model Not less than 5:1. Not less than 8:1			✓	✓		✓	✓		✓	✓	✓	

Appendix 1 to JAR-FSTD H.030 (continued)

	FSTD STANDARDS	FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
	1.3 Visual Systems	A	B	C	D	1	2	3	I	II	III	MCC	
l.2	Lightpoint contrast ratio. Not less than 25:1.			✓	✓		✓	✓					
m.1	Highlight Brightness. The minimum light measured at the pilot's eye position should be : 14 cd/m² (4 ft-Lamberts) 17 cd/m² (5ft-Lamberts) 20 cd/m² (6 ft-Lamberts)			✓	✓		✓	✓		✓	✓	✓	

FSTD STANDARDS 1.4 Sound Systems		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
a.1	Significant flight deck sounds, and those, which result from pilot actions corresponding to those of the helicopter shall be provided.	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	For FTD level 1 as appropriate for the system training required. Statement of Compliance required for FFS.
a.2	Sounds due to engines, transmission and rotors should be available								✓				
b.1	Sound of precipitation, windshield wipers, the sound resulting from a blade strike and a crash condition when operating the helicopter in excess of limitations.			✓	✓		✓	✓					Crash sounds may be generic Statement of Compliance or Demonstration of representative sounds required.
c.1	Realistic amplitude and frequency of cockpit acoustic environment.				✓								Objective steady-state tests required
d.1	The volume control shall have an indication of sound level setting which meets all qualification requirements.	✓	✓	✓	✓								

Appendix 1 to JAR-FSTD H.030 (continued)

These standards always refer to the type of helicopter being simulated, except for FNPT, which may be generic. For FNPT, the term “the/a helicopter” is used to represent the aircraft being modelled which can be a specific helicopter type, a family of similar helicopter types or a totally generic helicopter.

Wherever the term runway is used, it includes runways and FATO/TLOF.

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